HUMAN TECHNOPOLE

INTEGRATED REPORT 2021

HUMAN TECHNOPOLE

INTEGRATED REPORT 2021

TABLE OF CONTENTS

Letter to stakeholders 4

Methodology note 6

01 ABOUT US 12

1.1 Mission, vision and values 14

1.2 Research Centres and Facilities 18

1.3 Key details 28

1.4 Governance and organisation 31

02 OUR APPROACH TO VALUE CREATION 44

2.1 Stakeholder engagement and materiality matrix 46

2.2 The value creation model 53

2.3 Strategy 108

2.4 Responsible and sustainable approach 138

03 OUR EXPECTATIONS FOR THE FUTURE 150

3.1 Risks and opportunities 152

04 PERFORMANCE ANALYSIS 156

4.1 Key performance indicators 158

4.2 Financial statements 168

4.3 Auditors' Report on the Integrated Report 222

Letter to stakeholders

Dear stakeholders,

This year marks the second Human Technopole Foundation integrated report that continues the aim of sharing in a transparent manner the construction and development path of a large life science research centre, established from scratch by the Italian Government with the ambition of becoming an international scientific benchmark.

In achieving such objective, the attention paid by the Foundation to its value creation system is crucial, this being based on both the construction of internal scientific facilities and research centres and sharing its know-how and infrastructures with the national and international scientific community.

Indeed, the approach described has been consolidated following the introduction, with effect from 2021, of a new Agreement regulating relations between the Foundation and the three Founding Ministries (Economy and Finance, Health and University and Research) and specifying, amongst other things, that a part of the public resources allocated to the Foundation be used to finance planning, implementation and management of the so-called National Platforms (NPs), i.e. specific research infrastructures made available to external scientific projects selected following public consultation within the national scientific and academic community.

In 2021, the Foundation was involved in a range of activities. Amongst these, it is worth mentioning the completion and opening of the first research facilities and laboratories and the appointment of the scientific leadership for the research centres specified in the Strategic Plan approved in 2020.

Furthermore, over the last year we have signed new partnership agreements with other scientific institutes from all over the world, published numerous articles in leading science magazines and started running the ECF (Early Career Fellowship) programme under whose terms sizeable grants will be awarded over a five-year period to young scientists working on independent research projects.

Finally, the 2021 integrated report has also made significant progress from a technical and administrative viewpoint, confirming the growth in the organisation's managerial skills. Indeed, certification of the report has been issued as regards both financial and non-financial disclosures. Compared to the previous report, the latter has been further enriched by introducing new indicators obtained with the active involvement of all Foundation structures.

In 2022 the Foundation's boards/officers must seek re-election: in recent years we have been working extremely hard to get the Foundation up and running; the results obtained, including this innovative way of engaging with stakeholders, as is the integrated report, confirm our commitment to this chosen course.

We are therefore sure that the Foundation's next stage will also benefit from this exceptional effort in creating from scratch a large public research institute with core values of innovation, sustainability, knowledge sharing, behavioural integrity and transparent relations in all our dealings with other parties.

"Our biggest challenge in this new century is to take an idea that seems abstract - sustainable development"

Kofi Annan - UN Secretary-General 1996-2006

Chairman
Prof. Marco Simoni

Director
Prof. Iain Mattaj

Methodology note

ABOUT THIS INTEGRATED REPORT

The integrated report is the reporting tool used to describe how Human Technopole (hereinafter 'HT' or 'Foundation') creates sustainable short-term and long-term value.

The purpose of this document is to illustrate, analyse and assess the resources utilised by the Foundation to achieve its specified strategic objectives. In addition to being the result of an organisational and cultural process designed to extend conventional financial reporting, the integrated report is also a means of facilitating the coordination of internal departments in collecting and organising the information needed for the decision-making process.

Furthermore, the document makes explicit the methods of integration between economic, social and environmental sustainability employed in decision-making processes, strategy and governance, also through the methods of interaction and engagement with stakeholders, both direct and indirect ones. Finally, the integrated report meets the requirement to make transparent the Foundation's path of responsible and sustainable growth, in terms of organisational behaviour, practices and activities. HT began the path of drawing up the integrated report in September 2020. The first version for the fiscal year 2020 was published as a 'pilot' project in September 2021.

REPORTING GUIDELINES AND PROCESS

The integrated report has been developed in accordance with the provisions of the IIRC (**International Integrated Reporting Council**) Framework and drafted in conformity with GRI Standards: Core option (**GRI - Home**). In addition, several performance indicators not mentioned in GRI Standards have been introduced to both portray effectively their connection with the 8 strategic objectives laid down by HT and monitor the extent to which they have been achieved, providing a better picture of the activities the Foundation has implemented.

Although not amongst the requirements specified by Legislative Decree No. 254/2016, the HT integrated report pays special attention to the issues and areas mentioned therein: the issues receive extensive coverage with details of the current situation and the numerous projects implemented.

As regards current processes, the Foundation has implemented an Organisational Model pursuant to Legislative Decree No. 231/2001 and drafted specific corporate policies and processes designed to monitor and improve non-financial performance. In particular, it should be noted that in early 2022 the Gender Equality Plan was approved, this being a programmatic document outlining a set of actions and measures engaging HT on gender equality issues. The plan responds to the guidelines of the European Institute for Gender Equality (EIGE) as it aims to identify and implement innovative strategies to promote cultural change and equal opportunities in universities and research centres.

In order to produce the integrated report, an engagement process has been implemented that witnesses the active participation of both administration and scientific departments. More specifically, the reporting process is based on the information systems installed in the Foundation that have been integrated with special data collection and analysis tools. The data is mainly processed by extraction from the enterprise resource planning software and careful calculation and estimates were utilised in the case of specific reports received. For some of the content of the integrated report, like for example information about the areas of research or infrastructures, the Research Centres and Facilities were directly involved.

Nevertheless, the Foundation's aim is to further strengthen and organise the information system by integrating the ERP software currently used by the various scientific and administration departments with a business intelligence system ensuring that financial and non-financial data management is as automated as possible.

As hinted earlier, following on from the structure employed in the previous year, the integrated report has been organised in accordance with the IIRC framework.

We have detailed and described the capitals (Financial, Infrastructural, Intellectual, Human and Relational) forming the resources available to HT and used to achieve strategic objectives. In addition, special attention has been paid to the Foundation's value creation system, by illustrating the main activities performed and their connection with the above-mentioned strategic objectives.

Adequate information has also been provided about the HT Governance structure, strategy and key practices and policies in place along the entire value creation chain, as well as details regarding the stakeholder engagement performed by the Foundation. In addition, extensive coverage

is given to the links between Foundation strategic objectives and UN Agenda 2030 sustainable development goals.
With an eye to the future, the risks and opportunities arising from both the internal and external context have been analysed and details can be found herein in the dedicated section of subchapter 3.1.
Finally, there is a section covering HT financial performance as reported in the financial statements for the year ending 31st December 2021.

As regards the reporting principles utilised, in order to provide a complete picture, the following considerations are made:

PRINCIPLES FOR DEFINING THE CONTENTS OF THE REPORT	
REPORTING PRINCIPLES	**APPLICATION METHODS**
INCLUSIVENESS OF STAKEHOLDERS	HT has identified its stakeholders on the basis of the most significant entities with which it establishes relations. HT implements a series of practices and procedures aimed at responding to the needs expressed by its stakeholders, providing evidence of them in subchapter 2.1 of this document.
SUSTAINABILITY CONTEXT	HT considers and reports on corporate performance of a non-financial nature and sustainability considering the context in which it operates and the numerous standards and normative references ESG, SDGs, GRI Standards: Core option.
MATERIALITY	HT carries out an annual materiality analysis aimed at identifying the issues considered most relevant in terms of impact for both the Foundation and its stakeholders (through engagement activities).
COMPLETENESS	HT reports on all material aspects arising from the materiality analysis and evaluates them according to their impact perimeters.

Compared to the previous version of the integrated report (produced for 2020 as a 'pilot' project), there have been no significant changes to the reporting boundary, whilst the performance indicators most representative of the activity performed by the Foundation have been expanded and analysed. The 2021 integrated report has been verified by a specially-appointed firm of auditors.

The reference standard used to certify the document is the International Standard on Auditing "International Standard on Assurance Engagements 3000 (Revised) - Assurance Engagements Other than Audits or Reviews of Historical Financial Information" (hereinafter also "ISAE 3000 Revised"), issued by the International Auditing and Assurance Standards Board (IAASB).

REPORTING PERIOD

The information contained herein refers to the period 01/01/2021-31/12/2021. Nevertheless, the document also mentions activities that began in early 2022.

In addition, where possible, the reported data has been compared to the previous financial year. Indeed, it should be noted that as the previous year's document was a 'pilot' project, not all details could be compared.

GRI

Where possible, sustainability details are reported in accordance with the provisions of GRI Standards: Core option and suitably identified using the respective reference number.

CAPITALS

As previously mentioned, HT creates value over time using the resources represented by the following five "capitals":

Financial, i.e. the financial resources, allocated by public and private funds, made available to HT in order to carry out its activities;

Infrastructural, i.e. owned or leased real estate, facilities, structures, infrastructures, machinery and equipment;

Intellectual, i.e. scientific know-how, operational processes and procedures designed to guarantee the quality of activities;

Human, the intangible asset represented by the skills, abilities and experience of scientific and administration staff;

Relational, i.e. the relationships with the main stakeholders and partnerships with other scientific institutes or universities.

KEY TO STRATEGIC OBJECTIVES

The following table specifies the eight pillars of the HT strategy identified by specific set of symbols:

Generate **innovation and quality of research**

Develop and provision of **infrastructures, innovative research instruments**

Attract and train **research talents** and share of **research outputs**

Obtain **scientific reputation** and promote **dissemination**

Promote **innovation through research**

Contribute to **sustainability (environmental, social and economic)**

Building **partnerships, networking** and promoting **stakeholder engagement**

Achieve **effectiveness and efficiency of operational processes**

KEY TO SUSTAINABLE DEVELOPMENT GOALS (SDGs)

HT strategy is also based on the sustainable development goals of UN Agenda 2030.

The UN goals considered most pertinent to HT activities are then linked to the strategic objectives in order to highlight their specific relationships.

The following table specifies the 10 SDGs to which HT can provide or provides the biggest contribution:

REFERENCES

This document has been prepared with the assistance of **Anna Pistoni**, Associate Professor of Programming and Control at the Economics Department of Insubria University, and **Lucrezia Songini**, Full Professor of Business Economics at the Sustainable Development and Green Transition Department of Piemonte Orientale University.

For comments, requests, opinions and ideas for improvement regarding HT sustainability activities and the information contained herein, please contact the HT Finance team by sending an e-mail to the following address: **ht-dept-finance@fht.org**.

01 ABOUT US

Human Technopole is the institute for life science research located in the heart of MIND – Milan Innovation District. Born upon impulse of the Italian Government, HT carries out basic research aimed at developing innovative approaches to personalised and preventive medicine

1.1 Mission, vision and values 14

1.2 Research Centres and Facilities 18

1.3 Key details 28

1.4 Governance and organisation 31

1.1 Mission, vision and values

HT is an Italian life science research institute.

After having represented and extolled Italian excellence for millions of visitors during EXPO 2015, the Italian Government decided to take up the legacy of the universal exhibition by creating an open research centre to promote collaboration and bring added value to the Italian and European scientific research ecosystem. **Palazzo Italia**, the former Italian EXPO 2015 exhibition hall has been renovated and is now HT corporate premises.

Using an interdisciplinary approach based on knowledge creation and sharing, HT promotes innovation in the health sector and seeks to improve health and well-being.

HT is a private Foundation, established by Law No. 232 dated 11th December 2016, with which the Government decided to implement a project based on the setting up of an integrated multidisciplinary scientific research complex of national importance in the fields of health, genomics and data and decision science. HT Founder Members are the **Economy and Finance Ministry, Health Ministry and Education, University and Research Ministry (now University and Research Ministry)** that also perform supervisory duties.

On 30th December 2020, an Agreement was signed with these Founding Ministries to implement and promote the Foundation's mission, introduced by article 1, paragraph 275, of Law No. 160 dated 27th December 2019.

This assigns HT the specific function of science and technology park to support national scientific research, using an integrated multidisciplinary approach, in compliance with the principles of full access for the national scientific community, publication and transparency of the activity, verifiability of scientific results achieved, in accordance with international best practices.

The Agreement's field of application regards newly identified and constructed 'infrastructure facilities' (so-called National Platforms), as well as the resources required for their construction, management and maintenance. National Platforms consist of facilities, resources and connected services used by the scientific community to conduct high-quality research in its respective fields with no obligation to be from a certain organisation or country.

Finally, following publication in Official Journal No. 234 dated 30th September 2021, HT has been recognised within the list of public bodies included in the consolidated profit and loss account (ISTAT list) selected pursuant to article 1, paragraph 3, of Law No. 196 dated 31st December 2009 as amended (Accounting and Government Finance Act).

MISSION

The HT mission is to improve human health and well-being with a special focus on the issue of ageing

The mission will be achieved by:

- **Establishing and running** scientific services and facilities that can be made available to external scientists, thus meeting the requirements of national and international life science research communities;
- **Performing** frontier life science research aimed at developing innovative approaches to personalised and preventive medicine;
- **Organising and offering** career development and opportunities for the next generation of scientists;
- **Driving innovation and progress** by promoting technology transfer and engaging with industry in order to help turn scientific discoveries into tangible applications for the benefit of patients and society;
- **Disseminating** scientific activities and achievements to strengthen the message that science is a public asset.

VISION

Scientific excellence is the guiding principle for all HT activities. HT's vision is that of an internationally competitive research institute, applying the highest standards in biomedical research.
HT staff are recruited through international, open calls and strict meritocratic selection procedures carried out by internal and external experts in the various fields. The aim is to attract the most talented scientists and provide them with an optimal environment in which to pursue their research interests, as well as help to create a dynamic, constantly-evolving scientific environment allowing continuous development of the institute's skills and scientific profile. One of HT's parallel aims is to create a pool of highly-qualified researchers who, after their stint at the institute, can enrich the national scientific community, having a beneficial long-term cascade effect on the country's research system.

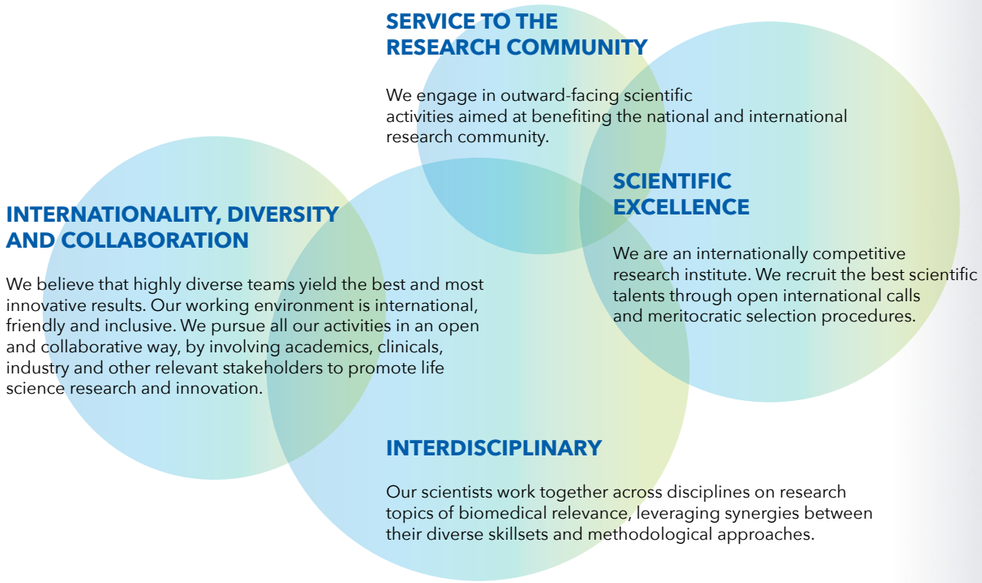
In addition to its desire to become an internationally competitive research institute, HT aspires to serve the community, also by granting access to top-level technology platforms and offering the best training opportunities through research and coordination partnerships in specific areas.

Furthermore, HT's research vision is based on a mix of fundamental and translational research. Indeed, HT expresses extensive fundamental research expertise in areas key to understanding human biology and physiology. On the other hand, translational, more medically-oriented research will mostly be conducted in collaboration with external organisations and industrial and clinical-hospital partners.

HT therefore seeks to enrich and contribute to the improvement of the national system, aiming to represent a benchmark for Italian life science academia.

VALUES

The values shown in the following figure are put into practice under the terms of the behavioural principles contained in the HT Code of Ethics:



The Foundation's general ethical principles represent the fundamental values of the operating procedures designed to achieve the institutional purpose. These are shown in the following figure:

- LEGALITY
- COMPLIANCE WITH ISTITUTIONAL PROCEDURES
- TRANSPARENCY
- FAIRNESS IN THE EVENT OF POTENTIAL CONFLICTS OF INTEREST
- COMPLIANCE WITH THE SYSTEM OF POWER OF ATTORNEY AND THE MANDATE
- PRIVACY
- DILIGENCE
- IMPARTIALITY AND NON-DISCRIMINATION
- PROTECTION OF THE INTEGRITY AND DEVELOPMENT OF HUMAN RESOURCES
- OPPOSITION TO RACISM AND XENOPHOBIA
- INTERNAL CONTROLS
- HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION
- PROTECTION OF INSTITUTIONAL ASSETS
- PROPER USE OF THE INFORMATION SYSTEM AND COPYRIGHT PROTECTION
- APPLYING TO THE PERFORMANCE OF SCIENTIFIC ACTIVITIES
- REPUDIATION OF CRIMINAL ORGANISATIONS
- ANTI-CORRUPTION AND ANTI-MONEY LAUNDERING COMPLIANCE
- CAREFUL MANAGEMENT OF THE FINANCIAL RESOURCES, PREPARATION OF THE FINANCIAL STATEMENTS AND OTHER INSTITUTIONAL COMMUNICATIONS
- REPUDIATION OF TERRORISM AND SUBVERSION OF THE DEMOCRATIC SYSTEM
- RELATIONSHIPS WITH SUPERVISING MINISTRIES, PUBLIC SUPERVISORY AUTHORITIES, CONTROL BODIES AND PUBLIC INSTITUTIONS IN GENERAL
- TAX COMPLIANCE

1.2 Research Centres and Facilities

THE SCIENTIFIC CONTEXT

In biomedical sciences, the ultimate aim of research is to improve personal health and well-being. Today, this is especially important since our society is aging rapidly due to increased life expectancy, declining fertility rates and rapid social and economic development. Many people are living longer, but not necessarily living well or in good health, and strenuous efforts to prevent and manage disease are required in order for people of all ages to enjoy a better quality of life.

Health, ageing, and quality of life are intricately affected by a combination of intrinsic factors, primarily related to the genetics of each one of us, and extrinsic factors, such as lifestyle and environment. Due to their complexity and effect on biological mechanisms, traditional approaches to disease are no longer considered sufficient.

Against this background, a new approach to human health research is under development. Based on causal pathways including genes, environment and lifestyle, this approach increasingly leads to etiology-based treatment of the illness.

In particular, great technological advances over the last decade have paved the way for systematic interrogation of the entire human genome (the complete DNA sequence of an individual) and other aspects of human biology. These include the epigenome (modifications to the genome that often occur in response to the environment and alter gene expression and function), the transcriptome (all the RNAs transcribed from the genome), the proteome (all the proteins made from RNAs) and the metabolome (all metabolites found in a cell, organ, tissue or organism).

At the same time, digital technology and advanced computational analysis generate comprehensive datasets covering lots of different types of information about many individuals and the methods required for their analysis. As a result, we are living in a new era for biomedical research in which important biological issues directly related to human health can be tackled, at least in part, by studying human subjects direct and, where necessary, still using model organisms and other simpler systems.

Integrating and leveraging the information from these massive amounts of data has boosted scientists' chances of developing stratified approaches and better strategies with more emphasis on fighting or preventing disease in a 'personalised' or 'stratified' approach to health where information about a person's genetic makeup or his diseased tissue is used to select the most appropriate course(s) of action.

A certain number of these personalised treatments are already in use in pathologies such as cancer, cystic fibrosis, hereditary forms of blindness, etc. Development of these treatments depends on having both knowledge of the specific DNA or protein sequence of the 'disease gene' in the patient and a deep understanding of how a genetic change in that gene or protein can give rise to a disease state.

It is widely believed that stratified or personalised approaches will change the way many illnesses are treated, to the extent that many countries, including the United Kingdom, Finland, Iceland and the USA, are undertaking large-scale genomic sequencing studies as part of the cohort analysis of individuals whose health and well-being are monitored over many years.

At the same time, other types of large-scale data from a range of sources, for example clinical or socioeconomic data, can be leveraged in a similar way to develop new public health strategies or improve health system management, whilst also maximising personal health and well-being.

Clearly, in its current state as described above, health research requires a holistic, multi-scale approach and further development of new disciplines.

In view of the current, unprecedented opportunities for human health research, it seems just the right moment to build an Italian life sciences centre of the size envisaged for HT. Due to the requirement for this type of research to analyse huge amounts of data produced by scientists through the approach of 'Big Data' and Machine Learning, the use of these methods goes hand in hand with investment in computational methods.

RESEARCH AT HT

Against this backdrop, HT has decided to establish broad-based Research Centres with disciplines or fields covering a lot of different aspects of human health and disease.

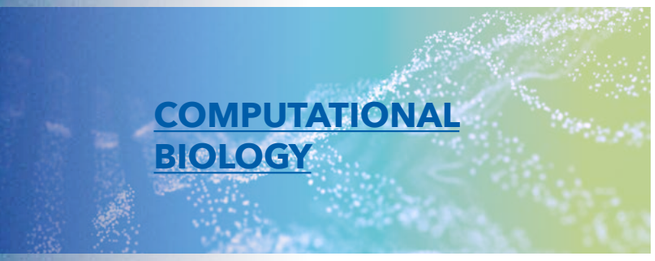
The reasoning behind this strategic decision is, on the one hand, to increase the possibility of recruiting outstanding research leaders, regardless of their specialist field, and, on the other hand, maximise opportunities for interdisciplinary collaboration, both inside and outside HT, that can be applied to a wide range of biological and health problems.

HT's contribution to human health is represented by a comprehensive, interdisciplinary approach to human biology study aimed at understanding basic physiological and disease mechanisms in order to help tackle some of the most important health challenges.

HT's research work helps to increase understanding of and develop new therapeutic strategies for various disease groups, including some chronic and degenerative diseases.

Five complementary areas of great importance to biomedical and health research have been selected to form the basis of HT's research strategy over the coming years: Genomics, Neurogenomics, Structural Biology, Computational Biology and Health Data Science.

THE RESEARCH CENTRES



GENOMICS

Piero Carninci
Head of Genomic Research Centre - Functional Genomics

Nicole Soranzo
Head of Genomic Research Centre - Medical & Population Genomics

The Genomic Research Centre aims to identify the complex mechanisms regulating gene expression and how heritable genetic information defines phenotypic traits. The Centre develops technology to study the essential mechanisms regulating genome activity in all cells in the human body, both healthy and diseased. Within the context of precision medicine, when applied to humans, this type of research can identify molecular targets and markers for disease prevention, early diagnosis and personalised treatment.

In addition to carrying out genetic and genomic studies with a focus on disease-associated mechanisms, the Centre aims to implement large-scale genomic screening projects for patient stratification.

The Genomic Research Centre features two complementary research programmes: Medical and Population Genomics (i.e. the use of genomic information to pinpoint the genetic causes of specific defects) and Functional Genomics (i.e. the development and use of new methods to study interactions between individual genomes and biological function).

AS AT 31ST DECEMBER 2021, THE GENOMIC CENTRE WAS RESPONSIBLE FOR 4 RESEARCH GROUPS.

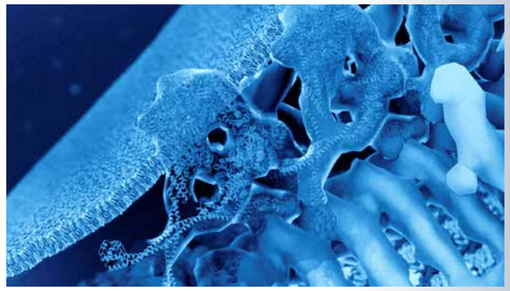
NEUROGENOMICS

Giuseppe Testa
Head of Neurogenomic Research Centre

The Neurogenomic Research Centre studies the mechanisms responsible for human neuropsychiatric and neurological disorders, ranging from neurodevelopmental to neurodegenerative disorders, combining basic and translational research through different experimental systems and computational approaches (from brain organoids to animal models and epidemiological cohorts) to probe nervous system structure, function and development at multiple scales of resolution.

AS AT 31ST DECEMBER 2021, THE NEUROGENOMIC CENTRE WAS RESPONSIBLE FOR 3 RESEARCH GROUPS.

STRUCTURAL BIOLOGY



Alessandro Vannini
Head of Structural Biology Research Centre

Gaia Pigino
Associate Head of Structural Biology Research Centre

How do macromolecular machines work and harmonise their activities in order to form a fully functional cell? How are these processes regulated and what happens in human disease? The Structural Biology Research Centre seeks to answer these questions by gaining detailed knowledge of the structure of macromolecules and macromolecular complexes, thus enabling their function to be understood, also by leveraging synergies with the other HT Research Centres. The Structural Biology Research Centre employs a state-of-the-art Cryo-EM technology platform employing both single particle analysis (SPA) and Cryo-Electron Tomography (Cryo-ET) to obtain high-resolution macromolecular structures both in isolation and in the cellular context. The Centre also employs complementary approaches, such as x-ray crystallography, single-molecule fluorescence microscopy, native and cross-linking mass spectrometry and a plethora of biophysical analyses to obtain details of macromolecular functional mechanisms.

AS AT 31ST DECEMBER 2021, THE STRUCTURAL BIOLOGY RESEARCH CENTRE WAS RESPONSIBLE FOR 5 RESEARCH GROUPS.

COMPUTATIONAL BIOLOGY

Andrea Sottoriva
Head of Computational Biology Research Centre

The objective of the Computational Biology Centre is to develop new mathematical and computational approaches to analyse and interpret medical and biological data. In HT, Computational Biology is not just about developing new data analysis methods, but, more importantly, also posing essential questions about human biology and health that can only be addressed by using computational approaches, from mathematical modelling of dynamical systems to machine learning and artificial intelligence. The Centre's ultimate goal is to make sense of the huge amount of data generated in biomedicine with a view to conceiving improved patient treatments. More specifically, one of the many research objectives is to identify cancer drug resistance mechanisms in order to predict tumour progression and thus take timely and effective action for every patient. The Computational Biology Centre will also be involved in conceiving cancer drug discovery and repurposing methods, using functional genomics data from cancer vulnerability screening and in vitro models. In addition to analysing genetic data from model systems and patients, activities also focus on single-cell and multi-omic data analysis, as well as processing medical and microscopy images using artificial intelligence.

AS AT 31ST DECEMBER 2021, THE COMPUTATIONAL BIOLOGY CENTRE WAS RESPONSIBLE FOR 3 RESEARCH GROUPS.

HEALTH DATA SCIENCE

Emanuele Di Angelantonio
Head of Health Data Science Centre

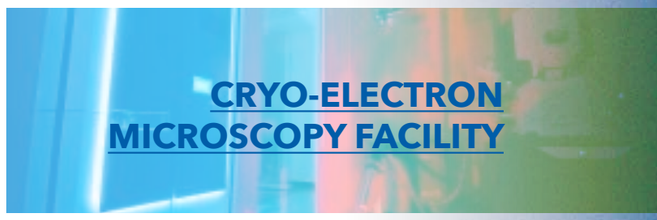
The Health Data Science Centre aims to become a benchmark institute for health data analysis.
It will collect data and information from a variety of sources, by engaging with regional healthcare districts, hospitals and national scientific societies.
The Centre will supplement clinical data with socio-economic and environmental risk factors to identify vulnerability profiles and aid targeted strategies.
It will also be working to promote data analysis solutions, developing and supplementing new analytical methods with clinical epidemiology and health research.

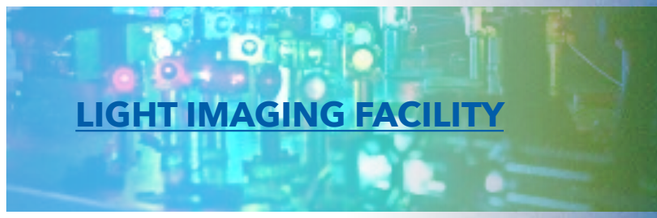
AS AT 31ST DECEMBER 2021, THE HEALTH DATA SCIENCE CENTRE WAS RESPONSIBLE FOR 1 RESEARCH GROUP.

FACILITIES

The HT campus features state-of-the-art infrastructures. The facilities are open and available to both HT scientists and researchers and the outside scientific community to whom access is granted through open merit-based selection procedures.

The first six research facilities currently being defined are:





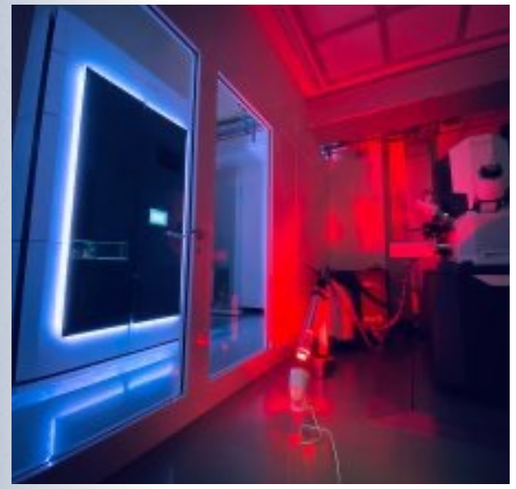
DATA CENTRE

Research activity requires considerable storage capacity to manage and analyse a huge amount of clinical information, biological data, images, etc. Our campus will therefore be equipped with a data centre having high storage and computing capacity. Furthermore, the Data Centre will have an ultra-fast broadband connection.

The Data Centre project, which is currently ongoing, involves the construction of new mechanical, electrical, special and fire-fighting systems to serve the 'CED', 'Library' and 'UPS' areas.

The design solution adopted allows the housing of new HPC systems, the CPU expansion planned for the coming years, and data backup systems. The project provides a structure that guarantees adequate cooling and power supply to ensure operability even in the event of failures.
For fire detection purposes, all rooms will be equipped with a smoke detection system and an air sampling early fire detection system. In the event of a fire, extinguishing will be ensured by the NOVEC gas extinguishing system.
The management and monitoring of critical and sensitive plant alarms will be integrated into the BMS supervision system.

CRYO-ELECTRON MICROSCOPY FACILITY



The HT Cryo-Electron Microscopy Facility's mission is to provide access to a world-leading, high-output scientific platform capable of solving in detail, from tissue to amino-acid side chains, the many issues that contemporary life science is called upon to tackle. All biological processes, including physiological and pathological events, are precisely orchestrated by active and reactive biological macromolecules.
The function, organisation and activity of these molecules closely depend on both their three-dimensional (3D) structure and the cellular environment in which they operate. The HT Cryo-Electron Microscopy Facility seeks to identify, visualise and characterise these biological players, both alone and in their cellular compartment.

The facility benefits from state-of-art equipment including:

- A Thermo Scientific Titan Krios G4i 300kV TEM equipped with Thermo Scientific Falcon 4 direct electron detector, Thermo Scientific Selectris X energy filter, Thermo Scientific CETA 16M and Volta phase-plate
- A Thermo Scientific Spectra 300kV STEM equipped with a Thermo Scientific CETA 16M with speed enhancement fully dedicated to electron tomography workflows
- A Thermo Scientific Glacios 200kV TEM equipped with Thermo Scientific Falcon 4 and CETA 16M and Volta phase-plate
- A Thermo Scientific Talos L120C 120kV TEM equipped with Thermo Scientific CETA 16M to allow both room temperature and cryogenic imaging (by Gatan ELSA cryo-holder)
- A Thermo Scientific Aquilos 2 DualBeam cryo-FIB system

Ancillary equipment includes a fluorescence microscope with a cryo-stage for CLEM applications, plunge freezing devices, glow discharge units, plasma cleaners, carbon coating system and other sample preparation tools for high-pressure freezing, freeze substitution and ultramicrotomy of vitrified-resin-embedded samples.

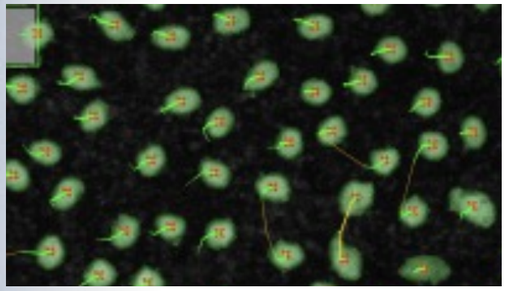
HT's Cryo-Electron Microscopy Facility is designed to efficiently combine single-particle analysis (SPA), electron tomography (ET) and correlative light electron microscopy (CLEM) workflows to study in detail the structure of single macromolecules and entire cellular compartments.

The Cryo-EM Facility will support the scientific requirements of HT's five interdisciplinary Research Centres. For example, by using SPA you can obtain a high-resolution 3D structure of proteins, enzymes and other macromolecules. ET is also employed at the Cryo-EM Facility to explore the internal architecture of cells, tissues and organoids. Focused ion beam-scanning electron microscopy (FIB-SEM) technology means that the Cryo-EM Facility can open a window to look inside vitrified samples. In addition, the Facility can perform sample preparation (e.g. high-pressure freezing, freeze-substitution, heavy metal staining, plunge freezing, micro-patterning) and analysis (e.g. screening sample screening by negative staining and Cryo-EM, correlative microscopy).

LIGHT IMAGING FACILITY

Optical microscopy is a more traditional technique allowing you to observe samples with lens magnification using visible light.
The Facility will focus on 3D imaging to meet the growing demand to photograph rare, dynamic and continually-evolving processes.

IMAGE ANALYSIS FACILITY



Modern imaging techniques in light and electron microscopy and computational approaches are changing the way biomedical research is conducted. Solutions for image restoration, (semi) automated downstream processing, smart microscopy or real-time image analysis, big data management and big data visualisation are key to the success of image and imaging-centric research. Many of these skills are provided by the HT Image Analysis Facility. Users can focus on their respective research and benefit from centrally provided, cutting-edge methods, tools, and services.

The Image Analysis Facility's central mission is to act as a knowledge incubator.

Bearing in mind that most of the scientific staff come and go quite quickly, the Facility setup answers the following question: *how can HT retain knowledge about complex bio-image analysis workflows for its scientific community*? The Facility's strategy is to keep workflows and tools alive, even after their respective inventor, architect or developer has left HT.

Besides this core technical support, the Image Analysis Facility also offers training opportunities for scientific staff across all backgrounds and career paths. This is an important activity for keeping the community educated and informed, including through the use of new knowledge-exchange models. The key to our mission is to build bridges between all HT Research Centres and research communities in Italy and abroad. The Facility is intended to be a venue for scientists to meet and exchange ideas and experiences and, of course, also a place in which to receive support from facility staff.

This 'direct access' to the internal and external community and overview of frequently occurring analysis problems which the facility naturally acquires means that identification of the required solutions and, consequently, the act of making new technology available when needed are key contributions to the scientific life of all our users.

GENOMICS FACILITY

The Genomics Facility is an infrastructure strategic to HT in implementing its mission and projects. The Genomics Facility is at the service of all HT Genomics Research Centres, enabling the development of projects on extensive patient cohorts and single-cell analysis. It will therefore be possible to analyse various types of samples with an increasing level of sensitivity and specificity.

Thanks to a team of specialist, highly-qualified professionals with proven technical and scientific experience in the application of sequencing technologies in different fields of investigation, the Facility is able to provide innovative, state-of-the-art services in various fields of genomic, transcriptomic, epigenomic and metagenomic research.

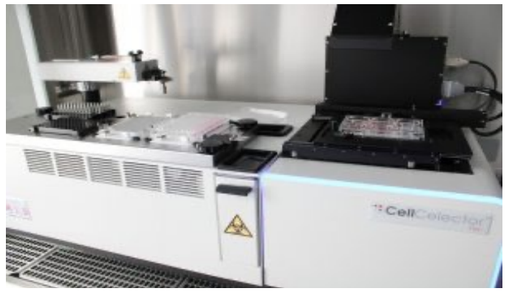
The Genomics Facility has state-of-the-art tools at its disposal including:

- NovaSeq 600 Illumina, the most powerful sequencer manufactured by Illumina
- Chronium Controller and Chronium X10x Genomics
- CellenONE f1.4 ScienION
- Chromium Connect 10x Genomics
- BD Rhapsody Single-Cell Analysis System BD Bioscience
- MiSeq Illumina
- TapeStation 4200 Agilent
- Fragment Analyzer Agilent
- FEMTO Pulse Agilent
- Bravo NGS Workstation Agilent
- Covaris E220 Focused ultrasonicator
- QIACube HT QIAGEN
- Glomax Discover Microplate Reader Promega

The Genomics Facility collaborates with HT Research Centres in carrying out research projects whose aims regard:

- Genomic studies of large patient cohorts aimed at identifying genetic markers associated with disease predisposition or onset;
- Functional genomic studies aimed at understanding the molecular mechanisms underlying transcriptional and epigenetic regulation;
- Neurogenomic studies aimed at analysing the differentiation of neuronal cells and tissues from pluripotent stem cells to brain organoids;
- Single-cell sequencing studies to obtain immune profiles in Covid-19 patients, study the immune infiltrate in tumours or determine the immunological mechanisms underlying the onset of immune system disorders.

AUTOMATED STEM CELL AND ORGANOID FACILITY



The Automated Stem Cell and Organoid Facility represents an especially innovative technological venture. Using automated pipelines, it is designed to streamline the processes needed to create biological models for disease study.
These include somatic cell reprogramming, genome editing and long-term organoid culture.

1.3 Key details

The figure below illustrates some of the most important results achieved during 2021 for each strategic objective:

HIGHLIGHTS 2021

+8,000
sqm of laboratories implemented

53% women employees as at 31/12/2021

47% men employees as at 31/12/2021

2M
of annual contributions for the CITT

5
Research Centres, 20 Research Groups, around 2M/Euros in external grants

159 employees as at 31/12/2021

97 people hired in 2021

95
participations of our scientists in conferences with validated talk/poster presentations

7
new collaborations with Universities/Irccs/Research Institutes/Industry

Digital Transformation

- Data and IT Governance
- Cybersecurity
- SAP implementation

2021 ROADMAP

Details follow of the salient events that have characterised HT's 2021:

- Stipulated the Convention referred to in Article 1, paragraph 275, of Law No. 160 dated 27th December 2019, aimed at enhancing HT's mission in its specific function as an infrastructural scientific pole supporting national scientific research
  ** stipulation 30.12.2020*
- Head of Computational Biology Centre appointed
- Work on Incubator Labs concluded
- Re-functioning of the North and South Pavilion completed
- Named "il Cardo" to Rita Levi-Montalcini, Nobel Prize winner for medicine and standard-bearer of Italian scientific research in the world
- First 100 employees hired and Cryo-EM microscopes installed
- Head of Health Data Science Centre appointed
- Winners of the first Early Career Fellowship Programme launched in 2020 announced
- Acquired full ownership of the two buildings named North and South Pavilion
- With a measure adopted pursuant to Article 1, paragraph 2, of Legislative Decree No. 196/2009, the National Institute of Statistics enters HT in the ISTAT List of Public Administrations

2021 ACTIVITIES

The following figure shows the main activities and projects carried out by Foundation departments during 2021:

Governance activities

- Procedure for identifying members of the Scientific Committee
- Adoption of the new organisational regulation
- Adoption of the policy for the definition, drafting and approval of policies and internal rules
- Adoption of the new procurement and Campus management
- Adoption of the new policy on the incentives fund

Scientific activities

- Finalisation of the scientific leadership structure
- Launching of research and scientific facilities activities in the HT Campus laboratories
- Several publications in prestigious journals, including Science, Nature and Nature Communications
- Awarding of the first research grants by scientists
- Formal scientific collaboration partnerships, e.g. with IRCCS Oasi Maria SS., "Scuola Internazionale Superiore di Studi Avanzati" (SISSA), EURAC Research and Fondazione Regionale per la Ricerca Biomedica (FRBB)
- Covid 19: continuing studies of the epidemiology and dynamics of the disease
- Launch of advanced scientific training activities and events for both internal and external HT scientists
- Identification of the first 5 deserving scientists for the contributions of the first 'ECF programme' call and launch of the second call

Administrative and institutional activities

- Development of ERP system and launching of projects for the integration of new software (Warehouse, Assets, Concur, Siope, E-catalogues, Success factor)
- Launching of projects of Cyber Security, Data and IT Governance, Network access control
- Data Centre set up and configuration
- Process mapping and HSE risk management
- Development and consolidation of the preliminary reporting system and start-up of the accounting risk management project
- Launching of PMO and PPM projects
- Initiation of functional acts to carry out CITT activities
- Intensive hiring activities in both scientific and administrative areas
- Consolidation in the use of the Sintel platform and recourse, where possible, to Consip agreements
- Launch of administrative activities following the Foundation's inclusion in the ISTAT list
- Promoting meetings and institutional initiatives with key stakeholders and building a network of agreements with relevant partners
- Outreach activities with Mind partners and launch of the HT Presents Project
- Launch of internal audit operational activities

Campus activities

- Acquisition and continuation of the re-functioning of the North and South Pavilion
- Finalisation of the South building feasibility project
- Finalisation of construction and delivery of the Incubator Labs
- PITA re-functioning and continuation of work on liquid nitrogen distribution line
- BMS integration Project start-up

1.4 Governance and organisation

The governance system laid down in HT's By-laws and its Regulations is that of a dual model.

More specifically, the *Consiglio di Sorveglianza*, chaired by the President of the Foundation, is the body responsible for the general direction and control of the Foundation's activities, while the Management Committee, chaired by the Director of the Foundation, is the management body responsible for carrying out activities for the Foundation's ordinary operations and the achievement of its objects.

THE PRESIDENT

The President is the legal representative of the Foundation. He acts as Chairman of the *Consiglio di Sorveglianza*, is responsible for strategic policy making, manages institutional and public relations and promotes training and communication activities relating to the social and economic impact of scientific research and the Foundation's public commitment.
Marco Simoni is the first President of the Foundation, appointed on 16th May 2018 by a Decree of the President of the Council of Ministers of the Italian Government.

Marco Simoni is an economist with experience in Government and academia. He has a degree in Political Science from the Sapienza University of Rome and a PhD in Political Economy from the London School of Economics. He is an adjunct professor at the Luiss University in Rome, where he teaches European and international economy. From 2007 to 2016, he was a faculty member at the London School of Economics, where he also taught and carried out research in the same field to finally become an Associate Professor. He interrupted his academic career between 2014 and 2018 to take up the role of International Economic Relations and Industrial Policy Councillor for Prime Ministers Matteo Renzi first, and then Paolo Gentiloni.

CONSIGLIO DI SORVEGLIANZA

The *Consiglio di Sorveglianza* is responsible for the excellence of the Foundation and compliance with the rules governing the appointment of its bodies. It monitors the use of resources, supervises the general coordination of internal audit functions, manages the scientific assessment of the Foundation's activities and carries out general policy-making and supervisory activity. In accordance with the By-laws the *Consiglio di Sorveglianza* has thirteen members, including its Chairman, appointed as follows:

- seven by decree of the President of the Council of Ministers, of which two are designated by the Minister of Economy and Finance, one by the Minister of Health and one by the Minister of Education, Universities and Research;
- the remainder are appointed as follows by decree of the President of the Council of Ministers, in consultation with the Ministers for the Economy and Finance, Health and Education, Universities and Research:

- one, in agreement between the Municipality of Milan and the Region of Lombardy;
- one, in agreement between the members, on condition that they pay, even together jointly, at least three per cent of the annual contribution paid by the State;
- one, by the Conference of Italian University Rectors (CRUI);
- one, by the Council of the Presidents of public research institutions;
- two, by the *Consiglio di Sorveglianza* from among scientists in disciplines related to the HT research projects and from among international public health experts, who mainly work abroad.

Each member of the *Consiglio di Sorveglianza* remains in office for four years and until new members are appointed. Each member can only be appointed for a second term once. The *Consiglio di Sorveglianza* meets approximately every 45 days and extraordinarily if necessary.

As at 31st December 2021, the *Consiglio di Sorveglianza* of the HT Foundation was composed of 11 members, excluding the Chairman, seven of whom were appointed by a Decree of the President of the Council of Ministers on 16th May 2018 and four of whom were appointed by a Decree of the President of the Council of Ministers on 29th January 2020.

In February 2021, Mr Daniele Franco resigned as a member of the *Consiglio di Sorveglianza* after he was appointed Minister of Economy and Finance.
His position on the *Consiglio di Sorveglianza* was taken by Mr Biagio Mazzotta, *Ragioniere Generale dello Stato*, who was appointed as a member of the *Consiglio di Sorveglianza* by a Decree of the President of the Council of Ministers on 30th September 2021.

A twelfth member of the *Consiglio di Sorveglianza*, Professor Giovanna Iannantuoni, Rector of the University of Milan-Bicocca, designated by the Conference of Italian University Rectors (CRUI), was appointed by a Decree of the President of the Council of Ministers on 5th November 2021.

The appointment of Rector Iannantuoni brought the numbers of the *Consiglio di Sorveglianza* to twelve including the Chairman. A thirteenth member may be appointed to represent the participating members.

The composition of the *Consiglio di Sorveglianza* as at 31/12/2021 was as follows:

MARCO SIMONI	President of the Foundation, Adjunct Professor of European and International Political Economy at Luiss University in Rome
GIOVANNA IANNANTUONI	Rector of the University of Milan-Bicocca and Professor of Political Economy
MASSIMO INGUSCIO	Prof. Emeritus of Physics at the Campus Bio-Medico University, Rome
MARCO MANCINI	Deputy Rector for Organisational Autonomy, Administrative Innovation & Resource Planning, Prof. "Glottology and Linguistics", Department of Modern Literature and Culture, the Sapienza University, Rome
MAURO MARÈ	Professor of Public Economics at Luiss University in Rome
BIAGIO MAZZOTTA	*Ragioniere Generale dello Stato*
MARCELLA PANUCCI	Chief of Staff Minister for Public Administration
MARIA GRAZIA RONCAROLO	Director Centre for Definitive and Curative Medicine and professor Pediatrics and Medicine at Stanford University
DONATELLA SCIUTO	Executive deputy Rector of Milan-Polytechnic
ROBERTA SILIQUINI	Professor of Public Health and Pediatrics, Turin Italy, former President of the National Health Council, Ministry of Health
GIANLUCA VAGO	President of the CNAO Foundation, former Rector of the University of Milan
ALESSANDRO VESPIGNANI	Physics professor at Northeastern University and Founding Director of Northeastern Network Science Institute in Boston

THE DIRECTOR

The Director of the Foundation is responsible for implementing the long-term strategic plan and chairs the Management Committee.

Iain Mattaj is the first Director of the Foundation, appointed on 18th June 2018 by the *Consiglio di Sorveglianza* as a result of an international competition.

An internationally renowned scientist, over the years Professor Mattaj's research has made significant contributions in the field of ribonucleoprotein particles (RNPs) that function in the processing of messenger RNA precursors. From 2005 to 2018, he was the Director General of the European Molecular Biology Laboratory (EMBL, Heidelberg), Europe's leading life sciences laboratory, world-renowned for its outstanding research in molecular biology and for hosting a significant number of Nobel Prize winners over the past twenty years, including the 2017 Nobel Prize in Chemistry for cryo-EM.

THE MANAGEMENT COMMITTEE

The Management Committee is responsible for the management of the Foundation's ordinary activities and operations. The Committee is composed of five members, including the Director who chairs it. Each member of the Management Committee remains in office for four years and until new members are appointed. Each member can only be appointed for a second term once.
The members of the Management Committee are appointed by the *Consiglio di Sorveglianza*.

The members as at 31/12/2021 were as follows:

IAIN MATTAJ	Director of the Foundation. From 2005 to 2018 Director General of the European Molecular Biology Laboratory (EMBL, Heidelberg)
IRENE BOZZONI	Full Professor of Molecular Biology at the Sapienza University, Rome
NANDO MINNELLA	Director General at Italian Institute of Nuclear Physics
STEFANO PICCOLO	Full Professor of Molecular Biology at University of Padua
FABIO TERRAGNI	Partner and Director of Alchema

THE SCIENTIFIC COMMITTEE

In 2019, the HT Foundation was still at a stage that was preparatory to its actual scientific research operations. Therefore, in order to ensure the efficiency, efficacy and cost-effectiveness of the Foundation's work, the *Consiglio di Sorveglianza* decided not to immediately appoint a Scientific Committee in the manner and form laid down in the By-laws and Operating Regulations, because the high operating costs would have been inconsistent with the actual activities it was called upon to perform. The *Consiglio di Sorveglianza* therefore decided to appoint a smaller Scientific Advisory Panel.

This panel was appointed on 15th November 2019 and was called upon to perform the functions and powers laid down in the By-laws for the Scientific Committee, on a temporary basis and, in any case, until no later than 1st March 2022. In 2021, the Scientific Advisory Panel carried out advisory and evaluation work for the *Consiglio di Sorveglianza* and the Management Committee on the implementation of the 2020-2024 multi-annual scientific programme, the appointment of scientific staff selection committees and the purchase of scientific equipment.

In the second half of 2021, the *Consiglio di Sorveglianza* started procedures to select the members of the Scientific Committee, which resulted on 28th January 2022 in the appointment of 14 members from leading Italian, European and US scientific institutions. These experts, who include eminent scientists from outside the Institute, are assigned an important advisory role by the Foundation's By-laws. They are in fact required to evaluate scientific protocols both in terms of quality and consistency with HT's multi-year plans. The Scientific Committee therefore replaced the provisional Scientific Advisory Panel, which has performed the same duties during the HT's initial start-up stage since November 2019 until today.

The current members of the Scientific Committee are as follows:

GUALTIERO RICCIARDI	Professor of Hygiene and Public Health at the Università Cattolica del Sacro Cuore, Rome, Head of Department of Woman and Child Health and Public Health of Fondazione Policlinico Universitario Agostino Gemelli IRCCS	*President*
GENEVIÈVE ALMOUZNI	Director of research, Centre National de la Recherche Scientifique, Institut Curie, France	*SC Member*
MARGARET MCMAHON	Global Head Data Science, Roche Information Solutions Data & Analytics, Switzerland	*SC Member*
GENNARO MELINO	Professor of Biochemistry, Director of Centre "Torvergata Oncoscience Research" (TOR), Tor Vergata University of Rome, Italy	*SC Member*
GIULIO SUPERTI – FURGA	Scientific Director, CeMM Research Centre for Molecular Medicine, Austria	*SC Member*
ANDREA BALLABIO	Director, Telethon Institute of Genetics and Medicine (TIGEM), Italy	*SC Member*
PIETRO DE CAMILLI	Director, Program in Cellular Neuroscience, Neurodegeneration and Repair (CNNR), Yale School of Medicine, USA	*SC Member*
KRISTIAN HELIN	CEO and President, The Institute of Cancer Research, United Kingdom	*SC Member*
ALBERTO MANTOVANI	Scientific Director, Humanitas Clinical Institute, Italy	*SC Member*
LUCA PANI	Professor of Clinical Psychiatry, University of Miami and full professor of Pharmacology and Clinical Pharmacology, University of Modena and Reggio Emilia, Italy	*SC Member*
ALFIO QUARTERONI	Professor and Director, MOX (Laboratory of Modeling and Scientific Computing), Milan-Polytechnic, Italy	*SC Member*
NADIA ROSENTHAL	Scientific Director, The Jackson Laboratory, USA	*SC Member*
MICHEAL SNYDER	Director, Centre for Genomics and Personalized Medicine, Stanford University School of Medicine, USA	*SC Member*
FIONA WATT	Director, European Molecular Biology Organisation, Germany	*SC Member*

BOARD OF AUDITORS

The Board of Auditors is composed of three effective members and three alternate members. They are appointed from among persons enrolled in the register of statutory auditors by a Decree of the President of the Council, based on a proposal from the Ministry of Economy and Finance and after prior designation by the Founding Ministries. Each Founder chooses one effective member and one alternate member. The members of the Board of Auditors remain in office for three years. The Board of Auditors oversees the Foundation's management and accounts, performs cash audits and prepares reports on the final accounts, which it submits to the *Consiglio di Sorveglianza*.

The composition of the Board of Auditors as at 31/12/2021 was as follows:

FABRIZIO VALENZA	President
CLAUDIA MEZZABOTTA	Effective member
MARTINO VINCENTI	Effective member

ORGANISMO DI VIGILANZA

In order to implement Decree No. 231/2001, the Foundation has formed an *Organismo di Vigilanza* (OdV) with independent powers of initiative and control. The Foundation's *Organismo di Vigilanza* has approved a "Statute of the OdV", which governs those matters that concern it most. HT opted for an OdV composed of three members.

In detail the OdV must satisfy the following requirements:

- **Autonomy and independence**: these requirements are essential to ensure that the OdV is not directly involved in the operational activities which it is required to oversee. The hierarchical independence of the OdV must therefore be guaranteed. The OdV is positioned as a staff unit at the most senior level possible.

- **Professionalism**: the members of the OdV possess the technical and legal expertise needed to perform their duties. These characteristics, together with the independence of the members, guarantee their objectivity.

- **Continuity of action**: the OdV maintains a constant presence in order to ensure the effective and continuous application of the Organisation, Management and Control Model pursuant to Legislative Decree No. 231/2001 (Model 231).

The OdV is responsible for general oversight of the following:

- the efficacy of a 231 Model, which is to say compliance with its provisions by the persons it applies to identified in relation to the different types of offences covered by the Decree;
- the actual effectiveness and adequacy of the 231 Model, i.e. its ability as regards the structure of the Foundation to prevent the offences specified by the Decree from being committed;
- maintaining the 231 Model's adequacy requirements over time;
- updating the 231 Control Model, where a need is found to adapt it to changes in conditions at the Foundation. This activity is normally performed at two separate, but related times:
  - submission of proposals to amend the 231 Model to the Foundation bodies/departments that can actually implement them;
  - follow up, i.e. checking the implementation and of the solutions proposed and that they actually work.

The composition of the OdV as at 31/12/2021 is as follows:

VITO BRANCA	President
SALVATORE SCUTO	Effective member
ANDREA CALLEA	Effective member

In 2021, the *Organismo di Vigilanza* ("OdV") carried out its work to verify the functioning of the Foundation's Organisation, Management and Control Model pursuant to Legislative Decree No. 231/2001 (the "231 Model"), compliance with that model and care taken to update it. The OdV has submitted periodic reports required by the 231 Model to the *Consiglio di Sorveglianza* on its activities. The supervisory activity was conducted using a variety of instruments.

First of all the *Organismo di Vigilanza* examined the information submitted to it by the Foundation's bodies, departments and areas, the submission of which is required by the 231 Model (the "information flows").

Furthermore, in order to ensure awareness of "Whistleblowing" existed as an instrument, the OdV supervised the dissemination of the specific rules adopted to manage reports of violations of the 231 Model. In addition to the above, the OdV carried out further investigations into specific processes and cases. In view of the Foundation's rapid and significant organisational and operational growth, the OdV commenced interviews with the heads of the Foundation's main departments. In order to conduct its supervisory work as efficiently as possible, the OdV co-ordinated continuously with the Internal Audit and Compliance Function. The OdV supported the start and continuation of work to update the 231 Model, through constant discussions with the Legal Department.

INTERNAL AUDIT & COMPLIANCE

In order to ensure that the Foundation conducts its activities properly, effectively and efficiently, in addition to ensuring that line controls formally specified in operating procedures are carried out, the Foundation has decided to implement an **Internal Control System** structured around its various activities:

With regard to its Compliance activities, in 2021 this function drew up and then implemented internal regulations as follows: Regulations, approved by the Management Committee and the *Consiglio di Sorveglianza*; Procedures approved by the Management Committee; and Guidelines, approved by the Director of the Foundation.

A process was also formulated and implemented for internal processing and sharing of these regulations in order to ensure oversight of the various Areas and Departments of the Foundation.

The function also manages a Conflicts of Interest Register, which records the declarations of new entrants, and assessments regarding cases such as the Foundation's agreements and collaborations.

The function operates across the board to spread awareness within the Foundation of the public nature of the funds that finance it and, therefore, of the care and rigour required in how they are spent and invested.

With regard to Internal Audit activities, the annual Internal Audit Plan, based on risk analysis, has been developed since 2020. As the first audits of the different Areas and Departments of the Foundation, those conducted in 2020 and 2021 employed a holistic approach, aimed not at analysing any specific process or activity, but the Area or Department as a whole.

The analysis will gradually become more specific and focused on processes and single activities as the various Areas and Departments develop and mature.

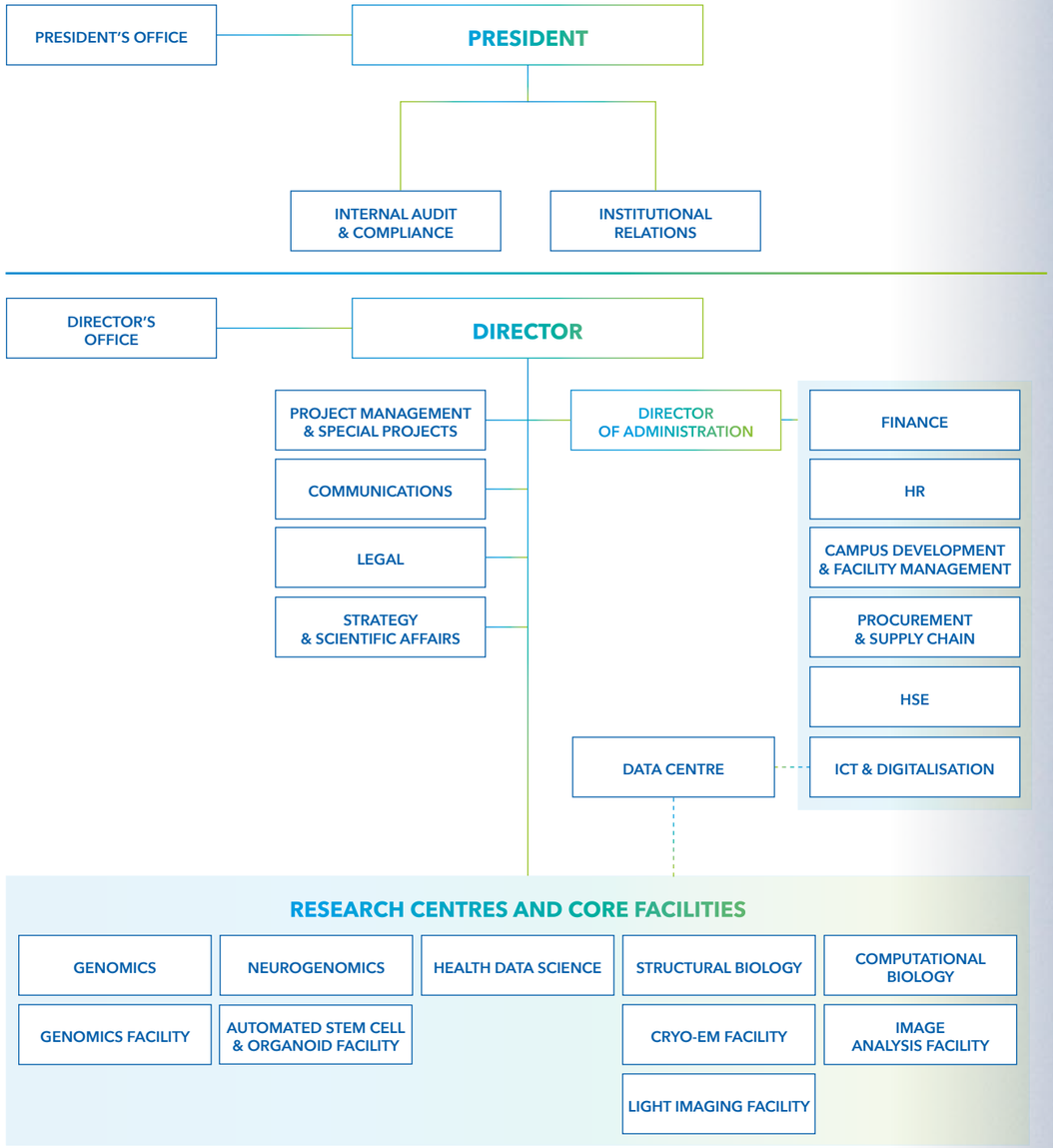
The following audits had been carried out as at 31st December 2021: a procurement audit and its two follow-ups, a Covid 19 audit and its follow-up, a missions and transfers audit, the start of an ICT audit, the start of a Human Resources audit.

FINANCIAL REPORTING OFFICER

The position of a Financial Reporting Officer was created in 2021 responsible for accounting and corporate documents, in accordance with Ministry of Economy and Finance (MEF) circulars for the application of Art. 154-bis of the Consolidated Law on Finance to the companies in which it holds stakes.

ORGANISATION CHART*

The organisational structure of the Foundation is formalised in its organisation chart:



organisation chart as at 31/12/2021

ADMINISTRATION

The implementation of HT's scientific activities goes hand in hand with the expansion and firm establishment of working teams and administrative activities, designed to provide efficient and flexible services and create an optimal working environment for scientists. HT is facing the challenge of very rapid growth in many areas, including personnel recruitment, laboratory space, the acquisition of facilities and equipment, organisational complexity, sources of funding, partnerships with public and private sector entities, etc. Operational and administrative activities are anticipated to a significant extent, where possible, but since growth is always accompanied by uncertainties, it is essential to promote and maintain a flexible culture capable of solving problems effectively and quickly.

The main priorities that guide the Administration Department are as follows:

- To build a robust administrative framework;
- To keep actions and initiatives in line with institutional strategies;
- To achieve high performance levels;
- To adopt a global approach to social and environmental impacts.

In this regard, on the basis of a proposal from the Management Committee, on 25th March 2021 the *Consiglio di Sorveglianza* approved an "Organisational Model" for HT which lays down regulations for the organisation as a whole and allocates duties and responsibilities within the organisation.

The Organisational Regulations define HT's general overall organisational structure, describe the activities and responsibilities of the various organisational units and define the hierarchical and functional relations between them. The organisational structure is essential to the pursuit of HT's institutional and By-law-related purposes and it satisfies the criteria of good management, transparency, efficacy and efficiency. An Administration Department was therefore created as part of the Organisational Model with an Administrative Director in charge of the department and who coordinates and supervises all areas and functions reporting to him/her. In addition, within the Department, heading the Finance Area the position of a Financial Reporting Officer was also created responsible for accounting and corporate documents, in accordance with Ministry of Economy and Finance (MEF) circulars for the application of Art. 154-bis of the Consolidated Law on Finance to the companies in which it holds stakes.

The Administration Department is responsible for initiating, supervising and coordinating the administrative activities of the Foundation, assisting with the drafting and implementation of administrative regulations and generally with all the Foundation's regulations, procedures and guidelines. The Department is composed of different "*areas and services*" each with specific functions and objectives described below.

FINANCE

The work of the Finance Department is designed to support the management of the Foundation's operational finances and its financial sustainability with a particular focus on the following areas:

- Accounting, Financial Statements and treasury;
- Budgeting and operational control;
- Financial management of projects and reporting;
- Tax;
- Digitisation;
- Financial Risk Management.

The guiding principles of the Finance Department's work are transparency and the use of an "internal customer" approach. Transparency in particular is crucial, above all because HT benefits mainly from public funds. Reporting of the costs incurred is therefore geared towards gaining credibility and acceptance. The Finance Department supports this process by ensuring full accountability and strict internal controls, which include the formulation of policies and rules to prevent fraud and minimise operational risks.

HR

HT's HR strategy is implemented by teams that specialise in various areas. Its objective is to respond to the Foundation's different needs (e.g. recruitment, training, international office, personnel management). Please refer to subchapter 2.2 of this report in the section on "Human Capital" for details of the principles that govern recruitment at HT.

The HR Department is responsible for the administrative management of the Foundation's staff and it supervises recruitment and the processing of staff contracts. It also formulates HR guidelines and policies, in line with the Foundation's strategic plan and objectives.

CAMPUS DEVELOPMENT & FACILITY MANAGEMENT

Work to develop the Campus and to manage facilities comes together in the strategic planning, development and management of the HT Campus, which includes land, buildings, technical areas and temporary infrastructure covering a total surface area of 27,579 square metres and a built-up area of 50,582 square metres. The department also manages mobility and corporate mobility services in the MIND campus.

PROCUREMENT & SUPPLY CHAIN

The main objective of HT's procurement activities is to create an environment in which researchers can concentrate on their scientific work by providing the most appropriate solutions for their requirements. The guiding principles of its procurement activities are transparency, broad participation and planning capacity, as required by national and European legislation.

In order to be able to operate and carry out its institutional duties, the Foundation procures works, services and supplies in compliance with Legislative Decree No. 50 of 18th April 2016, as amended, and the regulations in force on public tenders and contracts.

HSE

The HSE Department supports HT by updating and enforcing legal requirements concerning the environment and health and safety at the workplace, as well as by monitoring the relative compliance deadlines and in relations with the authorities and with the *Organismo di Vigilanza* pursuant to Legislative Decree No. 231/01.

ICT & DIGITALISATION

Providing support for HT's 'IT ecosystem' involves working with a variety of devices, operating systems, software applications and highly computerised users. In order to provide the customised and flexible solutions that the Foundation requires, the ICT Department, composed mainly of in-house staff, develops and supports the IT ecosystem with a service-oriented mindset, which guarantees high quality support for users. The department manages HT's entire IT infrastructure and implements IT standards and processes in accordance with the regulations of the competent authorities.

OTHER AREAS/DEPARTMENTS

Finally, HT's organisation chart is composed of the departments and areas listed below:

- **The President's Office**: this office performs the role of secretariat for the *Consiglio di Sorveglianza* and that of a general point of liaison between the *Consiglio di Sorveglianza* and the Foundation. More specifically, it draws up the agenda for meetings of the *Consiglio di Sorveglianza* and writes the relative minutes, co-ordinating with the various departments involved from time-to-time (Directorate, Legal, Finance, etc.). It also deals with official correspondence with the supervising Ministries, the Court of Audit ("*Corte dei conti*") and the Board of Auditors, and coordinates with the Foundation's other Governance bodies.

- **The Director's Office**: in addition to managing and supporting activities in which the Director of the Foundation is involved, this office acts as a point of contact for the members of the Management Committee by organising meetings of the managers involved in drawing up the agenda for each meeting of the Management Committee. It is responsible for and manages relations with HT's Scientific Committee and with relations between the Director and internal departments as well as external stakeholders. This department also works with the Document Management and Protocol Service, which is responsible for the registration, protocolling and sorting of incoming, outgoing and internal documents.

- **Institutional Relations**: this office oversees and develops institutional relations with national and local governmental institutions, European and international organisations, trade associations and companies. The department provides support for the Foundation's external relations and communication, by expanding its network of contacts and fostering appropriate stakeholder engagement with important partners. The Institutional Relations Office also provides support for the organisation of events, initiatives and strategic information campaigns and it represents HT at public events.

- **The Project Management and Special Projects Department**: in carrying out its activities this department employs a "project mode" approach to improve the success and on-time delivery of the Foundation's projects. The department also assists in drawing up the Foundation's Regulations, Procedures and Guidelines.

- **The Communications Department**: this develops and guides the implementation of a global communication strategy and provides strategic advice to leadership on communications. It drafts and distributes content for internal and external communication and it provides support for the organisation of institutional events, visits and scientific outreach at HT. The department is also responsible for relations with the press and the media.

- **Strategy and Scientific Affairs**: its main task is to support HT in the development of its institutional and scientific strategies by coordinating updates to the scientific programme and strategic plan. Furthermore, in addition to keeping staff constantly up to date on potentially important external activities and initiatives, it assists in drawing up regulations and guidelines for the training, supervision and mentorship of scientists. The department works closely with HT's scientists to find out their requirements, identify the best solutions for their research facilities, guide decision-making processes and assist in budget planning.

- **Legal**: the Legal Department is responsible for overseeing all the Foundation's activities in legal matters, while maintaining an independent viewpoint. The Head of Department (the General Counsel) is a registered lawyer, qualified to practise before higher courts, who represents HT through specific powers of attorney.

02

OUR APPROACH TO VALUE CREATION

HUMAN TECHNOPOLE HAS BEEN CREATED TO BRING ADDED VALUE TO THE SCIENTIFIC RESEARCH ECOSYSTEM IN ITALY AND EUROPE

In the initial phase of structuring the institute, the efforts have been focused on building the scientific infrastructure, launching research activities through the selection of excellent scientific leadership and establishing partnerships and collaborations with the key stakeholders

2.1 Stakeholder engagement and the materiality matrix 46

2.2 The value creation model 53

2.3 Strategy 108

2.4 Responsible and sustainable approach 138

2.1 Stakeholder engagement and materiality matrix

The importance of HT's strategic objectives was decided by involving corporate bodies, management and corporate functions and it runs along the same lines as those defined in the 2020-2024 Strategic Plan. The chart below shows the **Foundation's 8 strategic objectives** and some of the results achieved or that will be achieved in the coming years for each of them:

STRATEGIC OBJECTIVES	RESULTS
Generate innovation and quality of research	**5** Centres of Research: Genomics, Neurogenomics, Computational Biology, Structural Biology and "Health Data Science" and **20** research groups
Develop and provision of infrastructures, innovative research instruments	**6** Research Facilities, **51,000** sqm of offices and laboratories, **1029** "dry" workstations, **853** "wet" workstations in the near future
Attract and train research talents and share of research outputs	Up until **500** people will be hired by 2024 and roughly 70% will be dedicated to scientific research, services and scientific support. Overall investment of **5M** for Early Career Fellowship Programme in 2020 and as many in 2021
Obtain scientific reputation and promote dissemination	In 2021 more than **90** HT scientists hosted in conferences, **3** internationally prestigious awards received by our scientists, **21** dissemination initiatives organized for non-specialist stakeholders
Promote innovation through research	Contribution 2021 of **2M** for the management of a Centre for Innovation and Technology Transfer (CITT)
Contribute to sustainability (environmental, social and economic)	Environmental sustainability in MIND development, diversity and inclusiveness as core values of organisation and staff, attested by the introduction of the Gender Equality Plan (2022)
Building partnerships, networking and promoting stakeholder engagement	**Several initiatives and institutional meetings** organised in 2021 with our most relevant stakeholders
Achieve effectiveness and efficiency of operational processes	ERP (SAP) consolidation and implementation and Digital Transformation approach

Please refer to the subchapter 2.3 "Strategy" for further detail on the Foundation's strategic objectives.

MATERIALITY ANALYSIS

The materiality analysis was conducted in accordance with International Integrated Reporting Council (IIRC) guidelines. However, reference has been made to accountability criteria and "Core option" Global Reporting Initiative Standards (GRI) for a definition of key topics and the application of materiality principles.

The chart below shows the stages of the materiality analysis carried out by the Foundation, starting from the financial year 2020:

The materiality matrix summarises HT's various priorities and those of its stakeholders to give a summary of the strategic objectives which on the one hand guide the Foundation's actions and performance and, on the other, are able to influence decisions made by stakeholders. The materiality matrix also shows the degree of alignment or misalignment between the priorities assigned by the stakeholders to the different strategic objectives and the level of HT's commitment to them.

If we look in detail at the major HT stakeholders, the strategic analysis identified the following seven categories: **HT Staff, Founding Ministries, Industrial Associations, Local Institutions, Civil Society and Local Communities, Suppliers and Partners, Research Institutions and Communities**.

The importance of the various stakeholders was assessed and weighted on the basis of the following parameters: dependence (defined as the importance of the relationship for the stakeholder), influence (defined as the importance of the relationship to HT) and urgency (defined as importance of timing in the relationship).

The table shows the different categories of our key stakeholders and gives a description of their main characteristics:

Stakeholder	HT considerations	Stakeholder priorities	Link to our capitals of outputs	HT commitment
FOUNDING MINISTERS	As the founding members and financing institutions, they require to be kept informed on how the funds are used and on the Foundation's perspectives		• Relational capital • Intellectual capital • Human capital • Infrastructural capital	• Accountability and transparency of financial reporting • Involvement in defining the guidelines for the growth of HT
INDUSTRIAL ASSOCIATIONS	They ask for ability to market the results of our research by creating partnership and promoting the technology transfer		• Relational capital • Financial capital	• Involvement of external partners in developing the CITT (Centre for Innovation and Technology Transfer)
LOCAL INSTITUTIONS	They ask for HT's scientific excellence and efficiency in operational processes, thus contributing to the development of the local territories in terms of overall sustainability		• Relational capital • Intellectual capital • Infrastructural capital	• Organisation of events, initiatives, partnerships and collaborations • Development of processes of corporate digitisation
CIVIL SOCIETY AND LOCAL COMMUNITIES	They ask for HT's contribution to the development of the local territories in terms of overall sustainability and creation of partnerships		• Relational capital • Intellectual capital	• Initiatives of sensibilization to the scientific research • Focusing on activities and ESG practices
SUPPLIERS, PARTNERS	These stakeholders play an important role in enabling us to meet our commitments to create a centre of excellence in the research field		• Relational capital • Intellectual capital	• Fair tender, procurement and 'expression of interest' processes • Interactions aiming at creating partnerships within MIND area
HT STAFF	Employees play a critical role in ensuring we achieve our strategic objectives. We need to understand their needs, challenges and aspirations		• Relational capital • Intellectual capital • Human capital • Infrastructural capital	• Trainings • Employee surveys • Conventions/Welfare Programs • Direct engagements by supervisors and business management • Internal communication measures, including digital platforms such as intranet, announcements and campaigns • Code of Ethics
RESEARCH INSTITUTIONS/ COMMUNITIES	They require the possibility to create scientific partnerships, by establishing joint projects and sharing scientific infrastructures		• Intellectual capital • Human capital • Infrastructural capital • Relational capital	• Definition of scientific partnerships and scientific joint programs • Infrastructures sharing

The following aspects of HT's eight strategic objectives have been examined in detail:

- for **stakeholders**, the **relative importance of each strategic objective as perceived by the stakeholders and the "direction" of their expectations** (i.e. the demand for an expectation of commitment rather than disengagement on the part of HT);
- for **HT**, an **evaluation of the strategic objectives based on the current and future commitment to them** and its impact on the Foundation's activities.

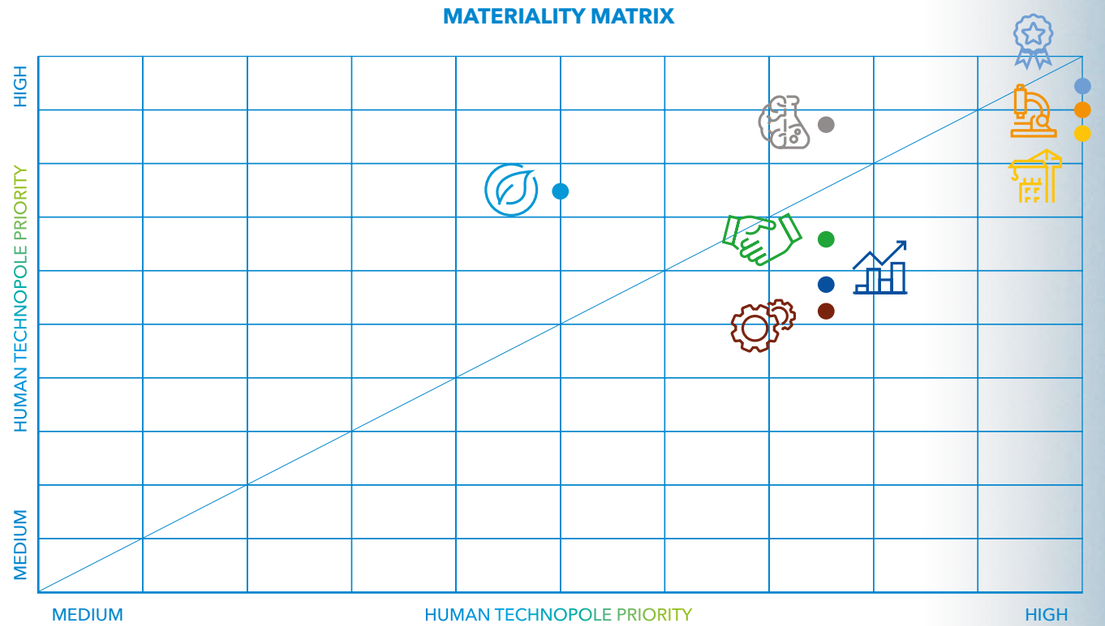
A snapshot was taken of the importance of the strategic objectives for stakeholders by analysing the results of interview, involvement and dialogue initiatives, which HT undertook in 2020. Interviews, surveys and institutional relations at national and local level and media monitoring are just a few examples of the methods that were considered.

It was considered best to update the 2020 results of the materiality matrix for the financial year 2021 by conducting a further series of interviews and analyses designed to both refine the engagement process and to confirm the stakeholder priorities expressed in the previous year.

A reading of the materiality matrix along each of its axes, helps to ascertain the following:

- on the **vertical axis**, the **priority**, appropriately calibrated on the basis of its importance to HT, **that stakeholders** attach to the various strategic objectives. In the upper part of the matrix we therefore see the topics for which stakeholders demand most commitment from HT in terms of investments, exploitation of existing activities and management systems or the formal declaration of clear commitments and policies.
- on the **horizontal axis**, the **strategic objectives on which HT plans to focus its efforts**. On the right-hand side of the matrix we therefore see the topics on which a high level of current commitment is expected now and in the coming years within the framework of HT's strategic objectives.

The most important strategic objectives for both HT and the stakeholders can be identified from the combination of these two different perspectives and consequently the degree of alignment or misalignment between external expectations and internal importance can be ascertained.



COMMENTS ON THE MATERIALITY MATRIX

The materiality matrix above shows a substantial general alignment between all the Foundation's strategic objectives and the stakeholders' priorities. The materiality matrix shows that the most important strategic goals for HT, which are **"Innovation and quality of research"** and **"Scientific reputation and dissemination"** are also priorities for stakeholders, as is the strategic objective **"Development and provision of infrastructures and innovative research instruments"**. The latter, unlike in 2020, was perceived in 2021 as a priority by both HT and the scientific stakeholders, i.e. research institutes and universities. This change, compared with the 2020 materiality matrix, is confirmed in the Convention signed between the Foundation and the Founding Ministries - Ministry of Universities and Research, Ministry of Economy and Finance and Ministry of Health. In fact this Convention assigns the task of supporting newly identified and built scientific facilities (defined as "facilities, resources and related services, used by the scientific community to conduct high quality research in their respective fields, without any national or institutional membership requirement") to the HT Foundation, as part of its mission as a key scientific infrastructure designed to support national scientific research.

We also report the assignment of greater priority compared with the previous year, both internally and externally, to the strategic objective of **"Effectiveness and efficiency of operational processes"**. This is due to the particular stage of development and growth in size that HT is currently undergoing. In addition to providing the elements needed to generate the materiality matrix, the stakeholder engagement activity allowed an in-depth analysis of the degree of alignment of each individual stakeholder with the Foundation's strategic objectives to be carried out.

More specifically, the Founding Ministries assigned maximum priority to the strategic objectives of **"Innovation and quality of research"**, **"Scientific reputation and dissemination"**, and **"Development and provision of infrastructures and innovative research instruments"** which were perfectly in line with internal priorities. The strategic objective **"Talent attraction and training, and research output sharing"** is of critical importance for the three ministries, as well as an important objective overall also for the Foundation.

The three strategic objectives considered most important by the Ministries are the top priorities for HT staff, while the strategic objective **"Talent attraction and training, and research output sharing"** shows a slight misalignment, notwithstanding the great importance assigned to it by both the Foundation and stakeholders, on which the Foundation itself will launch fine-tuning initiatives.

We note with regard to scientific stakeholders that most of HT's strategic objectives are considered to be of maximum importance for research institutions and universities. More specifically, perfect alignment was found on the strategic objectives of **"Innovation and quality of research"**, **"Scientific reputation and dissemination"**, and **"Development and provision of infrastructures and innovative research instruments"**.

Finally, the "Industrial Associations" stakeholders also assigned maximum importance to most of HT's strategic objectives, placing **"Innovation and quality of research"**, **"Scientific reputation and dissemination"** and **"Development and provision of infrastructures and innovative research instruments"** at the top of their expectations. Furthermore, they assigned the same degree of importance to **"Research-based innovation"**, to **"Partnership, networking and stakeholder engagement"** and to **"Sustainability (environmental, social and economic)"**.

2.2 The value creation model

According to the International Integrated Reporting Council (IIRC) framework, a graphical model is used in this section to describe how HT generates sustainable value for stakeholders. HT's value creation model focuses on strategic objectives which directs its activities towards the generation of different outputs by using the different types of capital available to it.

If we look at the details of the value creation model, we see that although the Foundation is still at the implementation and organisation stage, its activities can nevertheless make a significant, sustainable and socially responsible contribution to both the scientific community and the community at large.

The research that HT has started to conduct is high-level and lies in areas that are very important in biomedical and health terms. This aspect helps bring together researchers of high national and international standing who provide high-value research and results.

The infrastructure and technologies that HT possesses (and those which will be implemented further in the future) will be accessible to external scientists and will contribute significantly to satisfying the needs of the scientific community.

By establishing that a quota of the public funds guaranteed to finance HT feeds into what is known as the "National Platforms", the new Convention signed with the three Founding Ministries is perfectly compatible with the strategic objective of sharing HT's infrastructures and making them available to others.

Advanced scientific training programmes available both inside and outside HT are another of the Foundation's strategic pillars. The fundamental and founding principle of these training activities is to create a centre of excellence for the training of talented researchers in the biomedical sciences and to provide broad access to HT's expertise, its methods and its resources.

The Foundation uses the various types of capital available to it to carry out its strategic activities. For HT its human capital, which is its people, their skills and their diversity, is a fundamental asset. In addition to human capital, HT makes use of the important resources obtained from its financial capital, which, as established in Art. 1, paragraph 119 of Law No. 232 of 11th December 2016, consists of contributions from the Founding Italian Ministries and is added to by further contributions from different sources. Its infrastructural capital, consisting of tangible assets and facilities, as well as its intellectual capital, HT's know-how, help it to achieve its objectives of scientific excellence and sharing its infrastructure with external scientists and other research institutions. Relations with stakeholders, partnerships and collaborations with other research institutions, which constitute its relational capital, lie at the heart of its value creation model's activities.

All these different types of capital constitute the fundamental basis for creating value through strategic initiatives in the short, medium and long-term.

INPUT

Financial Capital
Financial resources available through public and private funding

Human Capital
Competence, experience, excellence and diversity of scientific and non-scientific staff

Infrastructural Capital
Assets owned by HT, facilities, infrastructures, equipment and services

Relational Capital
Relations with stakeholders group and collaboration with research centres and universities

Intellectual Capital
The Foundation's wealth of knowledge and organisation of scientific research

INNOVATION AND QUALITY OF RESEARCH

- Centre for Genomics
- Centre for Neurogenomics
- Centre for Computational Biology
- Centre for Structural Biology
- Health Data Science
- Publications / Grants

INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS

- Data Centre
- Genomics Facility
- Cryo -EM Facility
- Light Imaging Facility
- Image Analysis Facility
- Automated Stem Cell and Organoid Facility
- National Platforms

NETWORKING AND PARTNERSHIP

RESEARCH-BASED INNOVATION

- Centre for Innovation and Technology Transfer
- Partnership with pharmaceutical industries and companies
- Collaborations of R&D

TALENT ATTRACTION AND TRAINING

- PHD Training
- Courses and conferences for external scientists
- Scientific Visitors Programmes
- Early Career Fellowship Programme

EFFICIENCY AND EFFECTIVENESS OF OPERATIONAL PROCESSES

SCIENTIFIC REPUTATION AND DISSEMINATION

- Awards
- Events
- Conferences
- Scientific initiatives
- Conventions

SUSTAINABILITY

OUTPUT

Transformation of scientific discoveries into tangible applications for the benefit of patients and society

Attraction of additional funding, including from private sources

Development and career opportunities to the next generation of scientists

Operating scientific services and facilities to be made available to external scientists

Scientific collaboration, institutional events and initiatives of great relevance

Innovative approaches for personalized and preventive medicine

Awareness importance of science and scientific literacy

FINANCIAL CAPITAL

The pool of funds that is:

- **Available to an organisation for use in the production of goods or the provision of services**
- **Obtained through financing, such as debt, equity or grants, or generated through operations or investment**

The core funding for infrastructure development and conducting HT's activities comes from public funds granted by the Italian Government. These funds are provided on the basis of Art. 1, paragraph 121 of Law No. 232 of 11th December 2016, which, as of the financial year 2021, will be used with account also taken of the provisions of the Arrangement signed by HT on 30th December 2020 with the Founding Ministries. The Arrangement requires that a quota of not less than 55% of funding provided by law, net of the funding required to build, manage and maintain the foundation's existing facilities (i.e. the facilities under construction in accordance with the multi-annual scientific activity plan referred to in Articles 13.3 (b) and 18.2 (a) of HT's By-laws), is allocated to the "National Platforms" (NP), i.e. to the construction, operation and maintenance of specific scientific infrastructures, identified through a multi-level consultation process, to be made available to external scientific projects.

HT's financial capital is also composed of Government grants received pursuant to Art. 49-*bis* of Decree Law No. 34/2020, which provided for the creation of a facility entitled "Centre for Innovation and Technology Transfer in the Life Sciences" (CITT). This Decree Law, converted with amendments by Law No. 77 of 17th July 2020, requires the HT Foundation to adopt specific organisational measures for the use of the funds allocated for this purpose.

Finally, HT's financial capital also includes additional financing and contributions, some of which were formalised in 2021, from sources other than Government grants. It is expected that, in view of the growth and development of the Foundation and the implementation of scientific research activities, HT will be able to attract a growing quantity of different forms of contributions from different sources.

The Foundation's assets are composed of an endowment fund, which is unavailable and restricted to the pursuit of By-law related purposes, and an operating fund, which is used for HT's operating expenses.

HT's endowment fund consists of a fund that is restricted to the start-up of the scientific project. It was initially assigned to the *Istituto Italiano di Tecnologia* (IIT – Italian Technology Institute) for an original amount of €79,900,000 and then transferred to the Foundation, both in the form of funding and assets in kind, with a remaining amount of €77,230,557. The difference between the original amount of the fund and the amount transferred to the Foundation corresponds to the costs incurred for the start-up of the project by IIT.

As concerns the Operating Fund, paragraph 121 of the founding Law No. 232 of 2016 authorises spending on the HT project of €10 million in 2017, €114.3 million in 2018, €136.5 million in 2019, €112.1 million in 2020, €122.1 million in 2021, €133.6 million in 2022 and €140.3 million starting from 2023. This contribution is paid out on the basis of the state of progress of the HT project. Finally, that same Operating Fund also includes the amounts authorised by the Art. 49-bis of Decree Law No. 34/2020, according to which grants of €10 million for 2020 and €2 million per year as from 2021 are made to HT to promote and finance the "Centre for Innovation and Technology Transfer".

FINANCIAL CAPITAL – 2021 RESULTS

As at 31st December 2021 the Operating Fund, which totalled €327,059,490, was recognised within equity and included the contributions indicated in Art. 1, paragraph 121 of Law No. 232 of 11th December 2016, relating to the years 2019, 2020 and 2021 for the part not drawn on as at the reporting date and contributions granted for the implementation and operation of the "Centre for Innovation and Technology Transfer in the Life Sciences" (CITT).

This fund consists of three different items:

- HT Operating Fund amounting to €246,003,374;
- NP Operating Fund amounting to €69,569,748;
- CITT Operating Fund amounting to €11,486,368.

The table below shows movements in the operating fund and its allocation between the HT quota, the National Platform quota and the CITT quota.

HT AND NP OPERATING FUND

PERIOD	GRANTS UNDER L. 232/2016	GRANTS USED				GRANTS TO BE USED	OF WHICH	
		2018	2019	2020	2021		HT	PN
2017	10,000,000	275,387	5,070,516	4,654,097	-	-	-	-
2018	114,300,000	-	-	68,154,251	46,145,749	-	-	-
2019	136,500,000	-	-	-	2,596,626	133,903,374	133,903,374	-
2020	112,100,000	-	-	-	-	112,100,000	112,100,000	-
2021	122,100,000	-	-	-	52,530,252	69,569,748	-	69,569,748
TOTAL	**495,000,000**	**275,387**	**5,070,516**	**72,808,348**	**101,272,627**	**315,573,122**	**246,003,374**	**69,569,748**

CITT OPERATING FUND

PERIOD	GRANTS UNDER THE ART. 49-BIS OF LEGISLATIVE DECREE 34/2020 (CONV. INTO LAW 77/2020)	GRANTS USED		GRANTS TO BE USED
		2020	2021	
2020	10,000,000	90,775	422,857	9,486,368
2021	2,000,000	-	-	2,000,000
TOTAL	**12,000,000**	**90,775**	**422,857**	**11,486,368**
TOTAL OPERATING FUND				**327,059,490**

As already mentioned the "CITT Operating Fund" results from the contribution granted under the provisions of Art. 49-bis of Decree Law No. 34 of 19th May 2020.
The contribution for the Centre for Innovation and Technology Transfer for 2020 amounted to €10,000,000 and to €2,000,000 for 2021 and net of costs incurred amounted to €11,486,368 as at 31/12/2021.
Year 2021 ended with an operating surplus for the year for the HT Foundation of €17,747, after provisions for corporate income tax (IRES) and regional production tax (IRAP) of €542,538. Depreciation, amortisation and write-downs on tangible and intangible fixed assets amounting to €6,070,601 were recognised.
Furthermore, the work carried out in 2021 generated total financial commitments of around €83 million, which resulted in the opening of the first five buildings with infrastructures and scientific facilities, notwithstanding the difficulties caused by the COVID 19 pandemic.

Also, activities started as of 1st January 2021 under the Convention signed at the end of December 2020 between the Foundation and the three supervising Founding Ministries (MEF – Ministry of Economy and Finance, Ministry of Health, MUR – Ministry of Universities and Research), in accordance with the provisions of Art. 1, paragraph 276, letter a) of Law No. 160 of 17th December 2019.
These commitments translated into the recognition in the balance sheet of operating grants and capital grants of over €36 million, relating to the quota for the financial year, and into approximately €126 million in deferred income, for the part of those commitments earmarked for future years.
In financial terms, revenues of approximately €56 million in grants were recognised in 2021, against monetary outlays of approximately €79 million.

The table below gives details of the key figures for the financial year 2021 compared with the previous year:

EURO	31/12/2021	31/12/2020
VALUE OF PRODUCTION	36,220,072	12,372,887
GROSS OPERATING MARGIN	6,556,405	908,459
OPERATING RESULT	559,501	184,952
OPERATING SURPLUS	17,747	13,918
FIXED ASSETS	115,623,825	60,761,347
TOTAL EQUITY	404,381,790	381,959,527
NET FINANCIAL POSITION	60,479,034	83,552,616

RECLASSIFIED INCOME STATEMENT

The value of production is composed mainly of grants from the MEF totalling €36,109,240, of which €18,033,953 is operating grants and €6,070,601 capital grants.

Furthermore, operating grants of €422,857 were recognised in relation to CITT activities and OF €11,581,829 in relation to the quota for National Platforms.

Grants of €61,469 were also recognised from other entities (non-MEF funds) and "other revenues" of €49,363 were recognised, of which €17,747 from commercial rentals of space in Palazzo Italia.

The reclassified income statement compared with that for the previous financial year is given below (in euro):

RECLASSIFIED PROFIT & LOSS	31/12/2021	31/12/2020	VARIATIONS
VALUE OF PRODUCTION	36,220,072	12,372,887	23,847,185
EXTERNAL COSTS	19,083,397	7,310,418	11,772,978
ADDED VALUE	**17,136,675**	**5,062,468**	**12,074,207**
LABOUR COST	10,580,270	4,154,009	6,426,261
GROSS OPERATING MARGIN	**6,556,405**	**908,459**	**5,647,946**
AMORTISATION, DEPRECIATION AND OTHER ACCRUALS	5,996,905	723,508	5,273,397
OPERATING RESULT	**559,501**	**184,952**	**374,549**
FINANCIAL INCOME AND CHARGES	785	(2,028)	2,813
ORDINARY RESULT	**560,285**	**182,924**	**377,362**
PROFIT BEFORE TAXES	**560,285**	**182,924**	**377,362**
INCOME TAXES	542,538	169,006	373,532
OPERATING SURPLUS	**17,747**	**13,918**	**3,829**

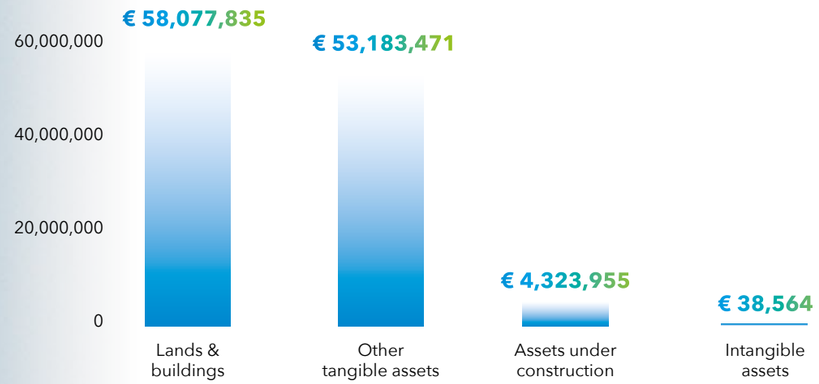
RECLASSIFIED BALANCE SHEET

The main movements in the balance sheet occurring in 2021 have been summarised in the table below, in which asset and liability items have been appropriately reclassified to show invested capital, sources of funding and their determinants. The table shows figures for the financial year 2021 compared with the previous year:

RECLASSIFIED BALANCE SHEET [€]	31/12/2021	31/12/2020	VARIATIONS
INTANGIBLE ASSETS	38,564	34,000	4,564
TANGIBLE ASSETS	115,585,261	60,727,347	54,857,914
FINANCIAL ASSETS	-	-	-
TOTAL FIXED ASSETS	**115,623,825**	**60,761,347**	**54,862,478**
STOCK	73,696	-	73,696
ACCOUNTS RECEIVABLE	93,594	14,204	79,390
OTHER ACCOUNTS RECEIVABLE	375,352,395	308,009,057	67,343,338
ACCRUED INCOME AND PREPAYMENTS	562,319	418,717	143,602
CURRENT ASSETS	**376,082,004**	**308,441,978**	**67,640,026**
PAYABLES TO SUPPLIERS	18,807,062	9,064,879	9,742,183
DOWN PAYMENTS	-	-	-
TAX AND SOCIAL SECURITY DEBTS	1,356,689	589,517	767,172
OTHER DEBTS	488,796	159,733	329,063
ACCRUED LIABILITIES AND DEFERRED INCOME	126,585,603	60,761,347	65,824,256
CURRENT LIABILITIES	**147,238,150**	**70,575,475**	**76,662,675**
NET WORKING CAPITAL	**228,843,854**	**237,866,503**	**(9,022,649)**
EMPLOYEES' LEAVING INDEMNITY	564,922	220,938	343,984
TAX AND SOCIAL SECURITY DEBTS (DUE BEYOND SUBSEQUENT YEAR)	-	-	-
OTHER LIABILITIES (DUE BEYOND SUBSEQUENT YEAR)	-	-	-
MEDIUM & LONG TERM LIABILITIES	**564,922**	**220,938**	**343,984**
NET INVESTED CAPITAL	229,408,776	298,406,911	(68,998,135)
NET EQUITY	**404,381,790**	**381,959,527**	**22,422,263**
NET FINANCIAL POSITION (MEDIUM LONG TERM)	-	-	-
NET FINANCIAL POSITION (SHORT TERM)	60,479,034	83,552,616	(23,073,582)
SHAREHOLDERS' EQUITY AND NET DEBT	**343,902,756**	**298,406,911**	**45,495,845**

The table below shows the composition of fixed assets as at 31st December 2021:

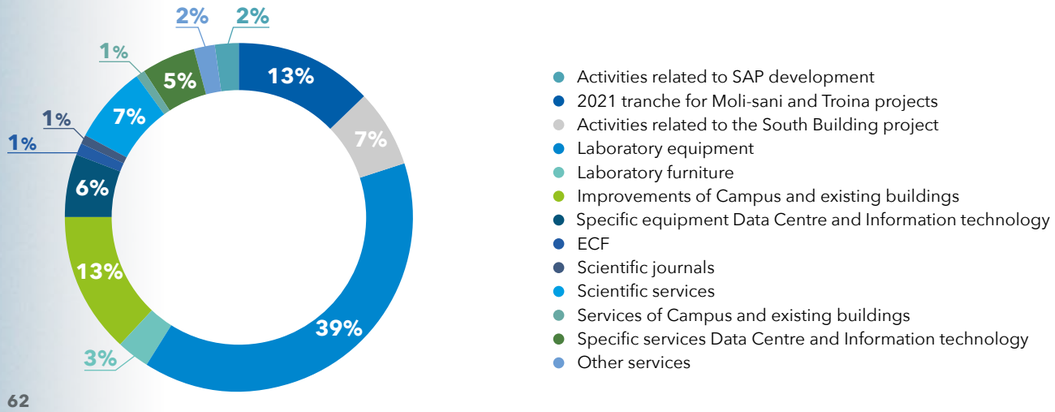
ASSETS 2021



The item "Lands and buildings" includes the purchase in September 2021 of two buildings, the US6/North Pavilion and Cardo/South Pavilion, for a total of approximately €18.3 million, in addition to the buildings already acquired in the previous year. Further investments were soon made in laboratory equipment, machinery and furnishings. It is underlined that the 2021 year-end item "Other tangible assets"" consisted mainly of the reclassification of part of the 2020 balance of the item "Fixed assets under construction". In addition to the on-balance sheet entries, HT formalised numerous commitments in 2021 which it expects to complete in coming years, for a total value of €67.78 million: €1.7 million for the continued development of the SAP platform, €9 million for the 2021 quota of the Moli-sani and Troina science projects, €4.7 million for activities related to the South Building project, €26.7 million for laboratory equipment, €1.9 million for laboratory equipment, €8.6 million for improvements to Campus and existing buildings, €3.9 million for Data Centre and IT equipment, €1 million for the ECF programme, €0.4 million for scientific journals, €4.5 million for scientific services, €0.7 million for services for Campus and existing buildings, €3.1 million for specific Data Centre and IT services and €1.6 million for other services.

The table below shows the composition of the commitments formalised in 2021:

ONGOING COMMITMENTS 2021 FOR € 67.8 ML



ECONOMIC VALUE GENERATED AND DISTRIBUTED

The table below shows details of how HT generates and distributes value:

EURO	2021	2020
ECONOMIC VALUE DIRECTLY GENERATED AND DISTRIBUTED	**36,220,040**	**12,373,457**
REVENUES	-	-
OTHER INCOMES	36,220,072	12,372,887
FINANCIAL INCOMES	1,968	570
ECONOMIC VALUE DISTRIBUTED	**30,133,693**	**11,636,031**
OPERATING COSTS (PURCHASES, SERVICES, INVESTMENTS)	18,892,279	7,309,685
EMPLOYEE REMUNERATION	10,580,270	4,154,009
REMUNERATION OF THE PUBLIC ADMINISTRATION (TAXES)	661,032	172,176
SHAREHOLDERS REMUNERATION	-	-
FINANCIAL BACKERS REMUNERATION	112	161
INVESTMENTS IN THE COMMUNITY	-	-
ECONOMIC VALUE RETAINED	**6,088,347**	**737,426**
DEPRECIATION, AMORTISATION AND ADJUSTMENTS	6,070,601	723,508
ANNUAL RESULT ALLOCATED TO RESERVES	17,746	13,918

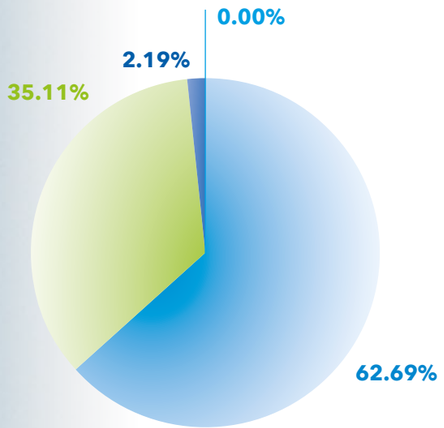
In the financial year 2021, the Foundation generated value of €36.2 million, an increase of 193% compared with 2020, due to operating grants and capital grants recognised by the MEF, in addition to operating grants related to the activities of the CITT and the National Platforms. The economic value generated is completed with other grants for scientific projects and, to a lesser extent, with other revenues generated by commercial activities.

The economic value distributed among stakeholders amounted to €30.1 million of which 62.69% is attributable to suppliers (costs for the purchase of materials, services, etc.) and 35.11% to employees (costs for wages and salaries). On the other hand, a remaining part (2.19%) consists of public administration remuneration for taxes and duties.

On the other hand, the economic value retained consists almost entirely of depreciation, amortisation and write-downs, and only 0.29% is attributable to self-financing (operating surplus for the year) generated by commercial activities.

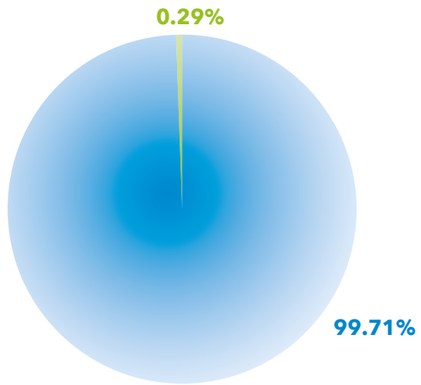
ECONOMIC VALUE GENERATED AND DISTRIBUTED IN 2021 AT A GLANCE

ECONOMIC VALUE DISTRIBUTED € 30.1 ML



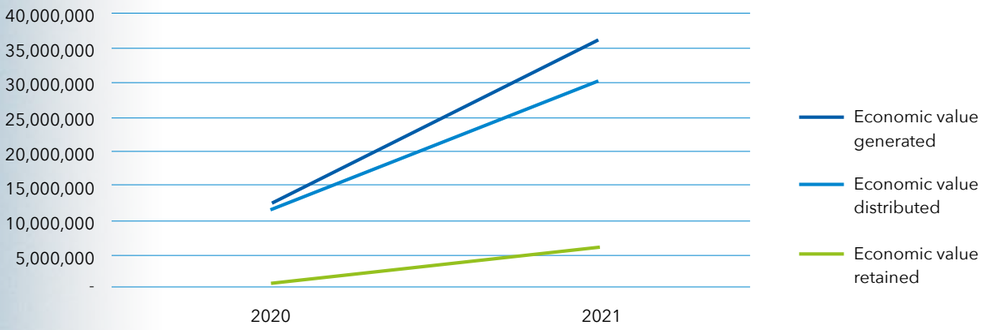
- Operating costs (purchases, services, investments)
- Employee remuneration
- Remuneration of the Public Administration (taxes)
- Financial backers remuneration

ECONOMIC VALUE RETAINED € 6.1 ML



- Depreciation, amortisation and adjustments
- Self-financing

ECONOMIC VALUE GENERATED AND DISTRIBUTED



GRANTS AND OTHER CONTRIBUTIONS

In 2021 the Foundation succeeded in attracting additional funding other than that granted by the State. These are grants and contributions awarded to HT within the framework of scientific projects and collaboration agreements. The tables below give a list of this funding showing the amount, the project or collaboration and the party providing the funding.
For full disclosure we also report data on the first months of 2022.

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
COMPUTATIONAL BIOLOGY	SANGER	OPEN TARGETS CONSORTIUM	199,365
COMPUTATIONAL BIOLOGY	GOOGLE	GOOGLE	8,747
POPULATION AND MEDICAL GENOMICS	IMPETUS GRANTS	LONGEVITY IMPETUS GRANTS	176,062
NEUROGENOMICS	BBRF	BBRF NARSAD YOUNG INVESTIGATOR GRANT 2020	44,000
COMPUTATIONAL BIOLOGY	SVCF	SILICON VALLEY COMMUNITY FOUNDATION	17,792
STRUCTURAL BIOLOGY	EMBO	EMBO POSTDOCTORAL FELLOWSHIP	133,108
STRUCTURAL BIOLOGY	EU	ERC CONSOLIDATOR GRANT	1,355,538
TOTAL GRANTS FORMALISED 2021			**1,934,611***

** of which 201k/Euro collected as at 31.12.2021*

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
COMPUTATIONAL BIOLOGY	SVCF	SILICON VALLEY COMMUNITY FOUNDATION	17,643
NEUROGENOMICS	WAF	WARREN ALPERT DISTINGUISHED SCHOLARS FELLOWSHIP AWARD	317,811
STRUCTURAL BIOLOGY	EU	ERC STARTING GRANT	1,498,750
STRUCTURAL BIOLOGY	EMBO	EMBO POSTDOCTORAL FELLOWSHIP	130,000
TOTAL GRANTS FORMALISED 2022			**1,964,204**

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
COMPUTATIONAL BIOLOGY	EU	HORIZON-INFRA-2021-SERV-01	767,000
GENOMICS-NEUROGENOMICS	EU	HORIZON-HL TH-2021-DISEASE-04	3,234,940
NEUROGENOMICS	EU	HORIZON-HL TH-2021-STAYHL TH-01	500,000
TOTAL GRANTS ASSIGNED BUT NOT YET FORMALISED			**4,501,940**

PROCUREMENT AND PURCHASES 2021

THE PRINCIPLES THAT GOVERN HT'S NEGOTIATING ACTIVITY

When it awards public contracts for the acquisition of works, services and supplies, the Foundation acts in accordance with the principles of economy, effectiveness, timeliness and fairness. It also complies with the principles of free competition, non-discrimination, transparency, proportionality and disclosure, as well as the principle of rotating invitations and awards in those procedures that require it, taking into account the criteria of energy and environmental sustainability and avoiding situations of conflict of interest.

The Foundation also guarantees compliance with the principles of disclosure and transparency, pursuant to Art. 29 of Legislative Decree No. 50/2016, as amended and it publishes information required by ANAC Resolution No. 1134/2017 – Attachment I, Section Invitations to Tender and Contracts, with reference to private sector entities pursuant to Art. 2-bis, paragraph 3, of Legislative Decree No. 33/2013.

Furthermore, business operators which wish to bid in the Foundation's tender procedures are required to accept compliance with its "Legality Protocols" and "Integrity Pacts", which contain measures for the prevention, control and combatting of crime and corruption as well as safety at the work place, signed or prepared by the Foundation and published on the website in the "Transparency" section. HT states in its notices, calls for tenders or letters of invitation that failure to comply with the clauses contained in the Legality Protocols or the Integrity Pacts constitutes grounds for exclusion from the tender.

Finally, HT has adopted an internal regulation that also governs conflicts of interest within the Foundation and provides for appropriate measures to combat fraud and corruption, as well as to identify, prevent and effectively resolve any possible conflicts of interest in its contract award procedures, in order to avoid any distortion of competition and ensure equal treatment for all business operators.

Finally, the Foundation also carries out checks pursuant to Art. 80 made on suppliers, which also include an assessment of corruption offences (Legislative Decree No. 50/2016, Art. 80 paragraph 1 letter a).

ACTIVITIES 2021

In 2021, the Foundation conducted the following activities for the procurement of goods and services in accordance with Legislative Decree No. 50/2016:

PURCHASE CATEGORY	PURCHASED VALUE	% PURCHASED
PURCHASES THROUGH CENTRAL PURCHASING AGREEMENTS	8,345,748	17.63%
PUBLIC PROCUREMENT	32,746,036	69.21%
OTHER CATEGORIES OF PURCHASES UNDER DL 50/2016	6,227,628	13.16%
TOTAL	**47,337,412**	**100.00%**

Trade payables for the year ended 31st December 2021, are composed geographically as follows:

- 96.75% Italian suppliers;
- 2.71% EU suppliers;
- 0.54% non-EU suppliers.

As of July 2021, HT started the implementation phase of its warehouse/supply chain structure with the following objectives:

- to manage the entire supply chain with a view to making savings on costs;
- to streamline the procurement flow of material for research activities (time/resources).

HUMAN CAPITAL

People's competencies, capabilities and experience, and their motivations to innovate, including their:

- **Alignment with and support for an organisation's governance framework, risk management approach, and ethical values**
- **Ability to understand, develop and implement an organisation's strategy**
- **Loyalties and motivations for improving processes, good and services, including their ability to lead, manage and collaborate**

HT's HR strategy is guided by the knowledge that employees' skills and involvement are crucial to the Foundation's success. Hard skills and professional competences are, of course, fundamental requirements, but HT also seeks to identify and recruit people with soft skills that are considered important for an international research institute (e.g. willingness to evolve and adapt flexibly, the ability to work in a multicultural environment, etc).

These factors are key to the creation of a shared culture based on specific values which are reflected directly in styles of work and leadership, in people's behaviour and in the overall working environment. HT's ambition is therefore to be point of reference and an internationally recognised research organisation able to attract the best research staff.

The guiding pillars of HT's Human Resource policies are as follows:

The Foundation strives constantly to create research groups that are as diverse as possible in order to foster the exchange of ideas and achieve the best results in each field. Because of this, HT selects and hosts research staff of any level and with heterogeneous experiencesranging: from young PhD students to experienced scientists who lead highly competitive research centres.

The table below lists HT's scientific leaders and the heads of its Research Centres:

PIERO CARNINCI	Geneticist, Head of the Genomic Research Centre – Functional Genomics Programme. He is currently Team Leader of the Laboratory for Transcriptome Technology and Deputy Director of the RIKEN Centre for Integrative Medical Sciences in Yokohama (Japan).
NICOLE SORANZO	Geneticist, Head of the Genomic Research Centre, Medical and Population Genomics Programme. She is also a senior group leader at the Wellcome Sanger Institute and a professor of human genetics at the University of Cambridge.
ALESSANDRO VANNINI	Molecular biologist and biochemist, Head of the Structural Biology Research Centre.
GAIA PIGINO	Biologist, Associate Head of the Structural Biology Research Centre. She is also responsible for a research group at the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden, Germany.
GIUSEPPE TESTA	Molecular biologist, he is Head of the Neurogenomic Research Centre. He is full professor at the Department of Oncology and Hemato Oncology of the University of Milan, previously he was director of the Stem Cell Epigenetics Laboratory of the European Institute of Oncology.
ANDREA SOTTORIVA	Professor of Cancer Evolutionary Genomics and Principal Investigator of the Evolutionary Genomics and Modelling Group and head of the Computational Biology Research Centre at Human Technopole.
EMANUELE DI ANGELANTONIO	Professor of Clinical Epidemiology at the Department of Public Health and Primary Care, University of Cambridge, he works on big data analysis applied to the study of chronic diseases, blood donors, and cardiovascular risk prediction. Head of the Centre for Health Data Science at HT.

On the other hand, the staff working in the Administration Department and in the other departments/areas outside the research centres focus their activities on supporting the development of scientific activities, through the design, construction and management of innovative infrastructures, as well as organising the management and international reception of human capital.

TRAINING AT HT

The improvement of its staff's expertise through training programmes and initiatives is a very important aspect of life at HT. HT supports its research staff in their scientific and career growth by providing training on cutting-edge subjects and technologies in biomedical and life sciences research and by actively promoting the career development of its scientists at all stages of their professional life. Training at HT also targets not only internal scientists but also external research staff through the development and provision of advanced training opportunities. HT's dynamic and multidisciplinary approach provides an ideal environment to foster the development of talented young scientists. Training activities at HT are inclusive and designed to promote a diverse environment.

The training activities are described below:

INTERNAL TRAINING

The objective of internal training at HT is to enable our scientists to reach their full potential as independent researchers and future scientists of excellence.

TRAINEES	The possibility for master students to perform their Master thesis at HT, in their lab of choice and upon acceptance by the corresponding Group Leader, is offered. Currently, HT has established partnerships for joint internship with different universities
DOCTORAL TRAINING	The participation in PhD Programmes in collaboration with national and international academic institutions is planned. HT is a host institution of the PhD Programme in Systems Medicine of the European School of Molecular Medicine (SEMM). HT is part of the joint PhD Programe in Data Analytics and Decision Sciences (DADS) with Milan-Polytechnic
POSTDOCTORAL TRAINING	Is aimed at broad and deep the research and soft skills of postdoctoral researchers, including courses in specific research areas and technologies
GROUP LEADER TRAINING	That is a comprehensive training package in order to boost the skills necessary to effectively run a laboratory or to establish themselves as leaders in their field. This package is formed by mentoring programms and career development activities

EXTERNAL TRAINING

The driving force behind HT's external training programmes is to create a centre of excellence to train promising researchers in the biomedical sciences through access to HT's expertise, methods and resources. Training events for external scientists include conferences, symposia, workshops and both theoretical and practical state-of-the-art courses on scientific and technological development in specific areas and technologies related to HT's science and that are of great importance to modern biomedical research.

SCIENTIFIC VISITORS

HT offers research staff from the national and international scientific community the chance to spend time in its premises on research collaborations, to learn and/or teach cutting-edge methods and technologies, or to use HT's infrastructure and Facilities.

EARLY CAREER FELLOWSHIP PROGRAMME (ECF)

The first edition was launched in October 2020. This programme is aimed to support the career development helping talented researches in starting their independent research activity.

In 2021, the evaluation of the first round of applications was completed and as a result five brilliant scientists received a grant of EUR 1 million over five years to develop innovative research projects in the life sciences (Genomics and Computational Biology, Neurogenomics, and Structural Biology).

The winners come from institutes located in various parts of Italy (SISSA Trieste, Humanitas Mirasole SpA Rozzano, University of Milan Bicocca, TIGEM Pozzuoli, IIT Genoa). The second ECF call was also launched in October 2021.

HUMAN CAPITAL - 2021 RESULTS

HT's staff recruitment and selection activities continued throughout 2021. At the end of 2021, the workforce was composed of 159 persons, 89 more than at the end of 2020.

In the research area in particular all the senior positions had been filled and this also included the selection of Group Leaders in the areas of structural biology, neurogenomics and genomics:

FRANCESCA COSCIA	Italian biochemist, expert in electronic cryo-microscopy. Her research focuses on molecular mechanisms that underlie thyroid function and diseases
PHILIPP ERDMANN	Chemical biologist and microscopist. His laboratory focuses on the analysis of the effects of liquid-liquid phase separation (LLPS) using cryo-electron tomography
ANA CASAÑAL	A biochemist, expert in integrated structural biology with a focus on cryo-electron microscopy. At HT her group combines state-of-the-art cryo-electron microscopy with biochemical and biophysical methods to decipher mRNA processing mechanisms and understand how their deregulation affects disease
BLAGOJE SOSKIC	Immunologist and geneticist. His research group uses a broad range of genomic and immunological experiments to study variations in the immune system. The group is particularly interested in understanding the genetic control of T cell – B cell interaction and antibody production
LORENZO CALVIELLO	Molecular and computational biologist. His laboratory uses omics technologies and computational approaches to highlight different aspects of translational control, examining both the coding and non-coding transcriptome
OLIVER HARSCHNITZ	Stem cell biologist. His research focuses on the mechanisms that cause neuro-immunological diseases, and on what leads to inflammation in the brain in particular
ELENA TAVERNA	Neuroscientist. Her research seeks to understand how neuronal stem cells influence brain formation. Answering this question is of crucial importance to understanding mechanisms underlying how the brain develops and evolves, and how these mechanisms are altered in neurodevelopmental disorders
JOSÈ DAVILA-VELDERRAIN	Computational systems biologist. He is interested in developing a deeper understanding of the diversity and dynamic behaviour of human brain cells

An overview of HT's workforce as at 31st December 2021 compared with the previous year is given below:

70 EMPLOYEES (DECEMBER 2020)

32

38

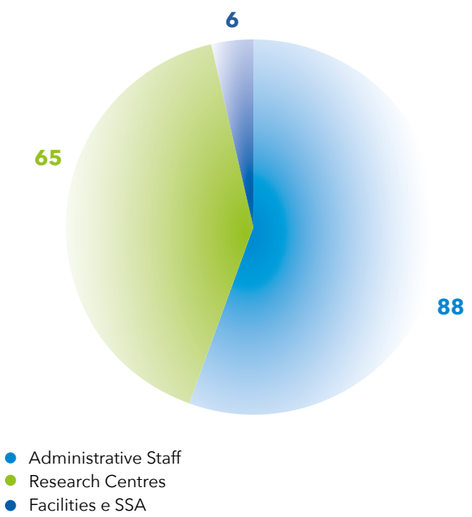
159 EMPLOYEES (DECEMBER 2021)

75

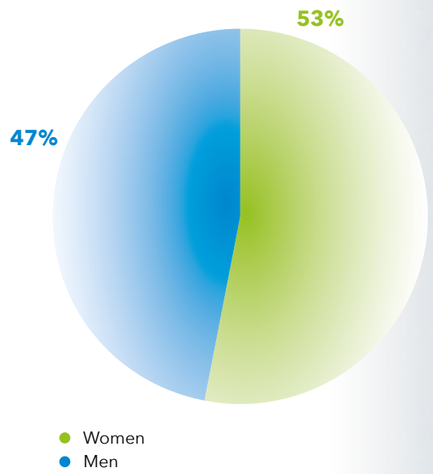
84

The tables below show the HT population as at 31st December 2021, by area of work, gender, age and nationality:

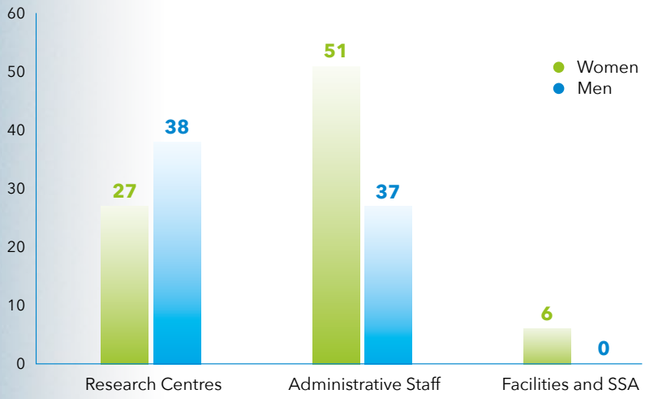
HT HUMAN RESOURCES BY AREA - 2021



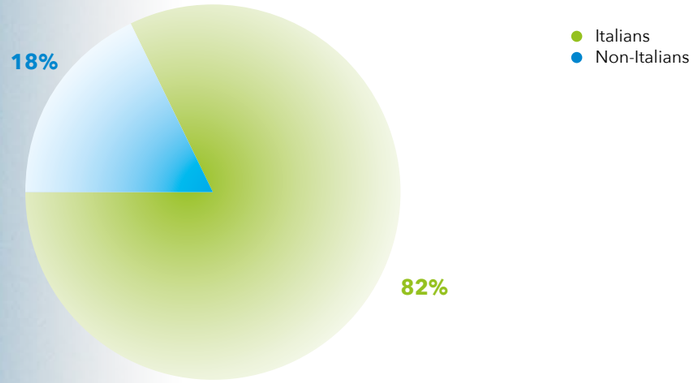
HT OVERALL GENDER DIVERSITY RATIO 2021



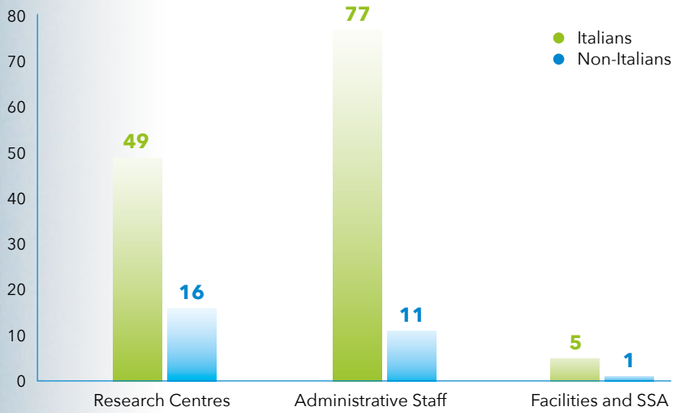
HT GENDER DISTRIBUTION AMONG AREAS - 2021



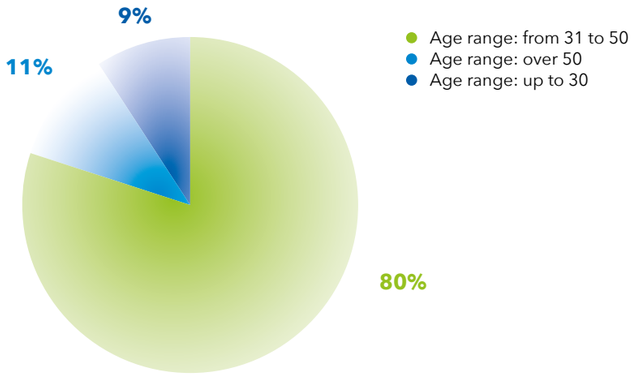
HT NON-ITALIANS / ITALIANS RATIO



HT NON-ITALIANS / ITALIANS DISTRIBUTION AMONG AREAS

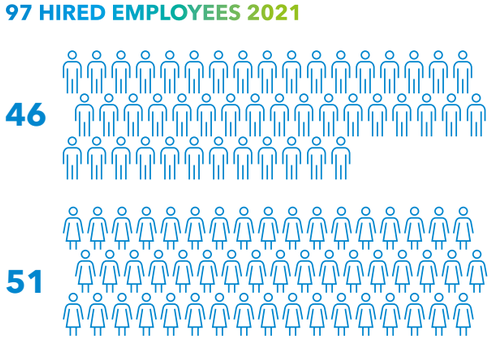


HT AGE DISTRIBUTION



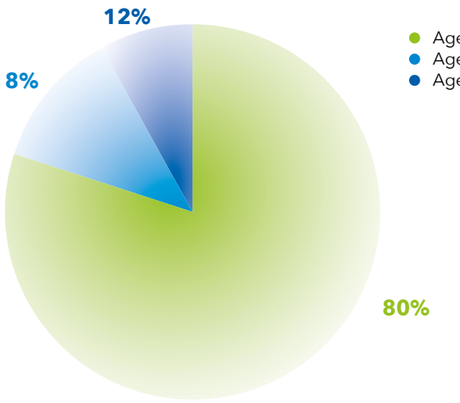
An overview is given below of employees hired and departing in 2021, by gender and age:

97 HIRED EMPLOYEES 2021

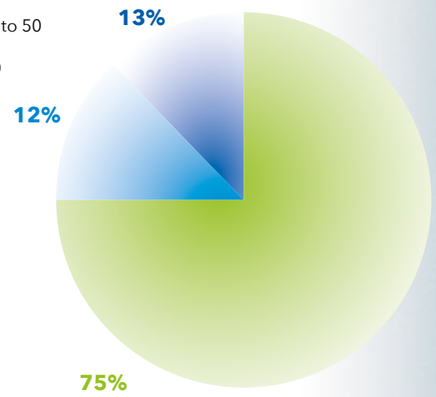


8 RESIGNED EMPLOYEES 2021

HT 2021 HIRED DISTRIBUTION BY AGE GROUP



HT 2021 RESIGNED DISTRIBUTION BY AGE GROUP



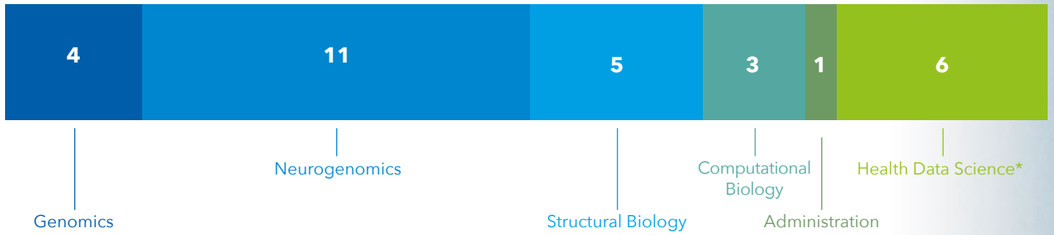
In 2021 the Foundation also continued its work on defining its organisational structure, in order to ensure better rationalisation and efficiency in the management of processes, both in the spheres of administration and research. This was achieved by drawing up and updating various regulations, such as the guidelines for the welfare plan and agile working. The Foundation adheres to the values of equal opportunities, inclusion and equality and in the first months of 2022 it decided to adopt a Gender Equality Plan (GEP), thereby complying with the guidelines of the European Institute for Gender Equality (EIGE), with the aim of further strengthening and formalising its constant commitment to providing support to all staff members, regardless of gender, nationality, religion, disability, age, cultural background or gender identity. This is a sign of its drive towards continuous improvement of well-being in the workplace, which is vital for the recruitment and retention of excellent human capital.
This set of actions and measures is designed to give due consideration to the Foundation's specificities and create a strategic vision aimed at the achievement of gender equality.
The plan will be valid for the years 2022-2024 and sets out the framework and measures that the Foundation will pursue to promote and improve gender equality within the organisation and to prevent discrimination, both by balancing leadership gender at all levels and by building a culture that strives to eliminate obstacles and conscious biases against all genders equally and to raise awareness throughout the organisation about unconscious gender bias.
Finally, 2021 also saw a significant increase in the number of PhD students and postdoctoral fellows at HT. Specific events and initiatives were also launched for these communities, and the first two training events for external scientists were held, attended by more than 40 young scientists from all over the world.

The tables below show the composition of post docs by area as at 31st December 2021 and the number of PhD students as at the same date:

POST DOCS NEL 2021

FORMER INSTITUTE	COUNTRY OF FORMER INSTITUTE	DEPARTMENT
Milan-Polytechnic	Italy	Health Data Science Centre
European Bioinformatics Institute	UK	Computational Biology Centre
Max Planck	Germany	Structural Biology Centre
Institute of Cancer Research (London)	UK	Computational Biology Centre
Dresden and the Gurdon Institute and Cambridge Advance Imaging Center and GSK	Germany	Neurogenomic Centre
University of Turin	Italy	Computational Biology Centre
Technische Universitaeat Meunchen	Germany	Computational Biology Centre

PHD STUDENTS IN 2021



**located at Milan-Polytechnic*

With regard to training activities, in 2021 HT signed a memorandum of understanding with the *Scuola Internazionale Superiore di Studi Avanzati* (SISSA – International School of Advanced Studies), the University of Naples 'Federico II' and the University of Turin. These agreements not only lay the foundations for scientific collaborations with these academic institutions, but also make it possible to organise joint training initiatives.

Furthermore, the first two training events for external scientists were held, focusing on content-aware image restoration and microscopy image analysis. A scientific symposium was organised during the year to inaugurate the cryo-microscopy facility as well as a laboratory management training event for junior group leaders.

Finally, in compliance with legal requirements (compulsory training), the following training and information initiatives were organised:

- general training (4 hours) and specific training (4 hours) under the State-Regions Agreement No. 221/2011 (e-learning conducted via a certified platform);
- information on the internal protocol for the management of anti-Covid-19 preventive measures and the relative learning tests (via the intranet portal);
- specific training for firefighting staff (8 hours) and first aid (12 hours) including the use of an AED defibrillator (5 hours) and the relative refresher training (5 hours firefighting and 4 hours first aid) using a specialised outside firm;
- information on the risks associated with working in agile mode and the relative test to check learning (via the intranet portal);
- RLSSA (health, safety and environment representatives) refresher training (8 hours) using a specialised outside firm;
- specific training for the *Responsabile Unico del Procedimento* (RUP – single manager responsible for tender procedures) and Contract Execution Manager (DEC), using a specialised outside firm;
- DGPR and Data Privacy training.

Details of average training hours by category and gender are given below for HSE training activities:

8.91 average training **HOURS** per **EMPLOYEE**

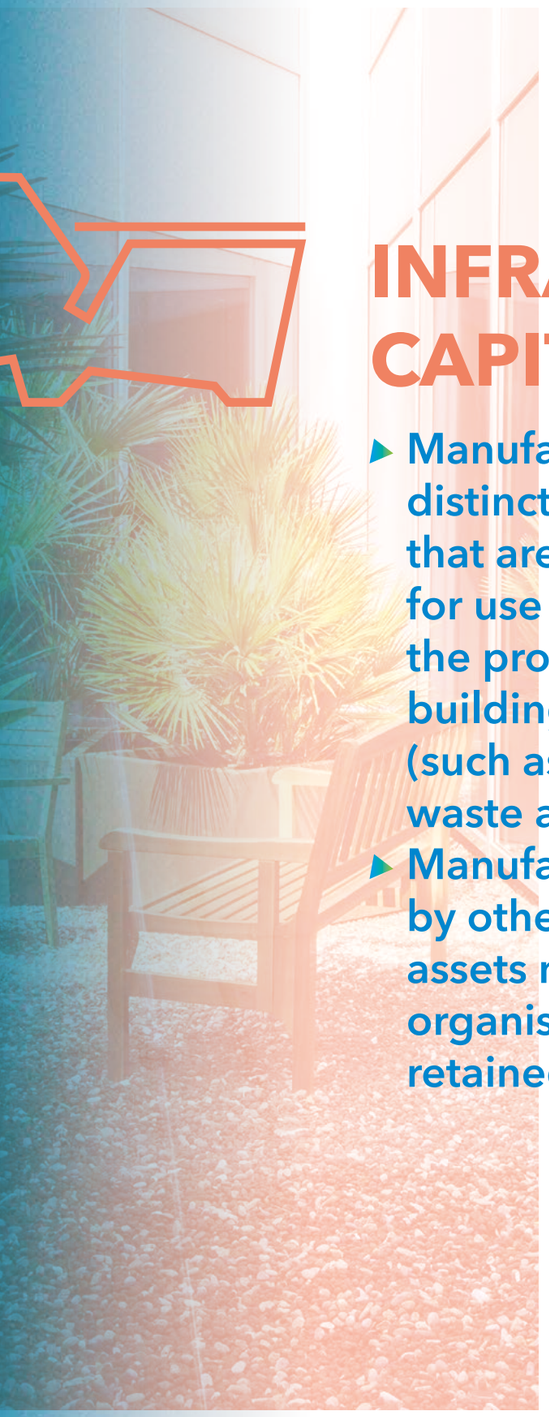
3.42 average training hours for **EXECUTIVES**

8.82 average training hours for **MANAGERS**

10.91 average training hours for **EMPLOYEES**

9.79 average training hours for **MEN**

8.13 average training hours for **WOMEN**



INFRASTRUCTURAL CAPITAL

- **Manufactured physical objects (as distinct from natural physical objects) that are available to an organisation for use in the production of goods or the provision of services, including: building, equipment and infrastructure (such as roads, ports, bridges, and waste and water treatment, plants)**
- **Manufactured capital is often created by other organisations, but includes assets manufactured by the reporting organisation for sale or when they are retained for its own use**

HT lies in the heart of MIND (Milano Innovation District), a new district of the city which covers over one million square metres on the former Expo 2015 site, located in the north-west of Milan.

MILANO INNOVATION DISTRICT

When its development is completed, MIND will contain a mix of public functions (e.g. research, higher education and healthcare) and private development. The aim is to create a science and technology park dedicated to the Life Sciences, Healthcare, Biotech, Pharma, Agri-food, Nutrition, Data Science and Smart Cities (i.e. urban innovation). MIND is also a public-private partnership which brings together two main realities, with Arexpo (the owner of the site) representing the public sector and the Australian multinational Lendlease, specialised in urban regeneration and infrastructure projects, representing the private sector. The MIND district will also host the new headquarters of the "IRCCS" Galeazzi research hospital (part of the private sector San Donato hospital group), the campus of the science faculties of the State University of Milan and the headquarters of the Triulza Foundation.
The "Decumanus", the central 1,500 metre-long section of the site, will become a green area, creating one of the longest linear parks in Europe.

Plans for the complete urban redesign of the area are based on a masterplan proposed by the international design and innovation firm Carlo Ratti Associati, winner of the international competition for the redesign of the site.

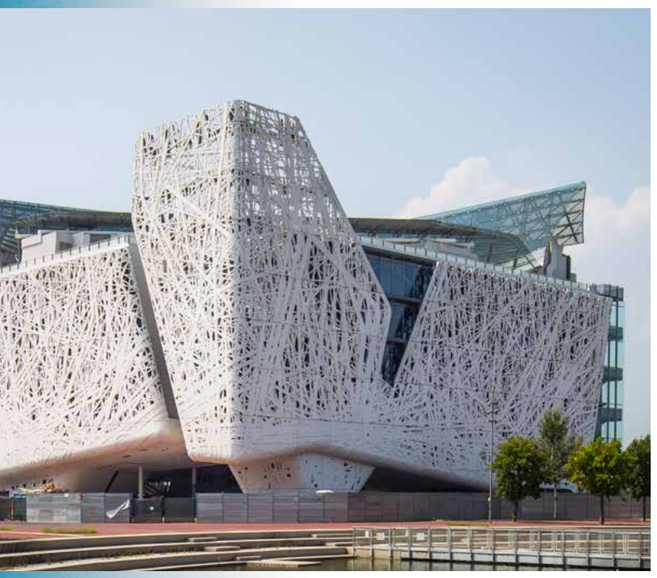
The project, promoted by Lendlease, is based on a number of important principles, including urban innovation, environmental sustainability and smart mobility.

Development of the area should cover a time span of approximately ten years, although Arexpo and Lendlease are working on the general infrastructure so that the first activities can begin in the next five years.

BUILDINGS AND LABORATORIES

In this context, the HT project is very central to MIND's development plans and as such its buildings are of high iconic value:

PALAZZO ITALIA

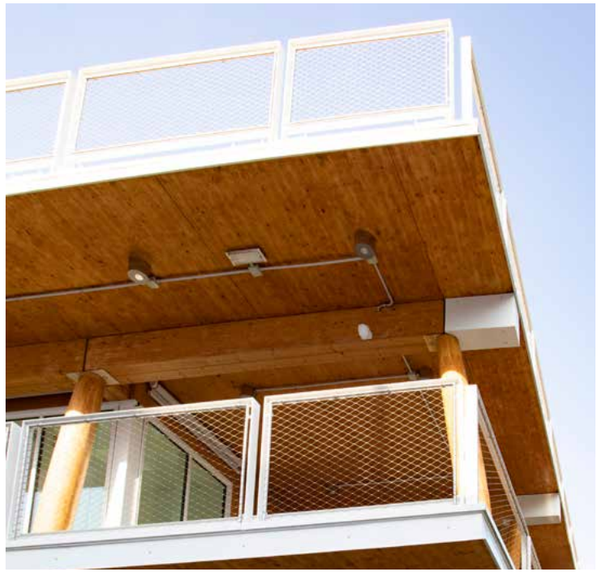


After representing Italy during EXPO 2015, Palazzo Italia is now the HT's institutional headquarters. Designed by the firm Nemesi, the building sits in front of the Tree of Life and has five floors, with a total height of 35 metres covering an area of 14,400 square metres.
The architecture is based on the idea of an urban forest with patterns of lines that generate light and shade. It was designed according to sustainability principles and conceived as a low-energy building. During EXPO Milan 2015, the exhibition spaces were dedicated to the power of beauty and the future to highlight Italy's creativity and potential. At the end of the World Expo, Palazzo Italia underwent intensive structural changes to transform the exhibition areas into spaces able to accommodate 400 workstations. Several areas have been retained, including the restaurant area, the auditorium, the panoramic terrace and the inner square.

INCUBATOR LABS

HT's first experimental laboratories were built on an area adjacent to Palazzo Italia and the Tree of Life. They consist of three buildings, two of which, both on two floors, mainly house laboratories, and a third, on one floor, which hosts the support Facilities for the Cryo-Electron Microscopy unit with two microscopes, a sample preparation room and a microscope control room. These house 130 "wet" stations, which are individual bench spaces for experimental researchers, with support desks, laboratories, instrument rooms, cell cultures, core services (glassware washing, kitchen, warehouse, etc.) and some offices. The laboratories have been operational since 2021.

NORTH PAVILION



The North Pavilion underwent substantial refurbishing to be able to host imaging Facilities with Cryo-Electron Microscopes (Cryo-EM) and optical microscopes (Light Microscopy Imaging). It has been equipped with support spaces for sample preparation and offices for the managers of the two facilities. The first floor houses twenty open-plan desks for the Image Analysis Facility staff and support for users of the two facilities. The building underwent major renovations so that it could house microscopes, which need a stable floor that is not subject to tremors, vibrations or the slightest oscillations and able to support their weight. The building has been operational since 2021.

SOUTH PAVILION

The South Pavilion was completely renovated in 2021. Starting in 2022, it will house experimental research laboratories for the various Centres and additional HT Facilities, as well as several spaces that will be used for offices.

SOUTH BUILDING

The new building will be composed of two functional and flexible units that will be developed around the "Common Ground", the focal point from which the entire building is generated. This is a central area that will lie at the heart of the building both in terms of its position and its function. It will have a ground floor that is partly open and partly glazed. Communal space will wind through the ten floors to create a single interconnected space that reaches up to the roof, thereby creating new spaces for gathering and relaxation. The first and ninth floors will be dedicated to laboratories and administrative offices, while the top floor will house catering areas, training rooms, meeting rooms for representatives, executive offices and terraces with direct access to the accessible green roof. The green roof is an iconic feature of the building composed of asymmetrical slopes and a sequence of south-facing green terraces overlooking the city of Milan. The roofing system provides good control of rainwater and will contribute to the generation of renewable energy in line with the green design approach which uses a photovoltaic system and of course the green roof itself.

PROPERTY DEVELOPMENT ACTIVITIES AND PLANS

Campus development plans are composed of three phases:

This phase started in the second half of 2018 and continued until the first half of 2021. The detailed planning of the Incubator Labs has been largely carried out over the course of 2019-20, working closely together with the first set of Heads of Research Centres and Group Leaders recruited to HT. Palazzo Italia, on the other hand, has been hosting the core of administrative activities and part of HT's research activities since early 2018. A further round of reburbishment of Palazzo Italia was finished in 2021 and further refurbishment work is planned during 2022.

This phase will last until the end of South Building construction works and is aimed at consolidating the first core of HT's experimental research and service activities (i.e. of the Genomics, Neurogenomics and Structural Biology Research Centres), located in the Incubator Labs, North Pavilion and South Pavilion.
These, from 2021, will host research (primary) labs, the first core of HT's scientific core facilities, as well as other common shared services (e.g., cell culture, animal facility, etc.). Subject to the completion of construction of the South Building, experimental research and service activities initiated in the Incubator Labs, North and South Pavilion should be transfer gradually from the end of 2026.

Starting at the end of 2026, we will focus on initiating and consolidating activities in the newly constructed South Building, which will be HT's main building for experimental research and service activities. The building will host labs, shared services and new Core Facilities, as well as spaces dedicated to the expansion of existing facilities, e.g. the Cryo-EM and the animal research facility.

INFRASTRUCTURAL CAPITAL – 2021 RESULTS

The Foundation continued its development of the Campus' infrastructure, together with Arexpo S.p.A., with the redevelopment of the "First Buildings" structures (North Pavilion and South Pavilion).

In April 2021, work was completed on the redevelopment of the North Pavilion and South Pavilion (former Expo constructions) and building the relative technical areas. Therefore, two respective temporary rental agreements were entered into between HT and Arexpo in order to make the areas available to the Foundation to manage its preparatory and laboratory priming activities. Subsequently, on 28th September 2021, in compliance with the provisions of the Memorandum of Understanding signed between HT and Arexpo in May 2019, the following was also carried out:

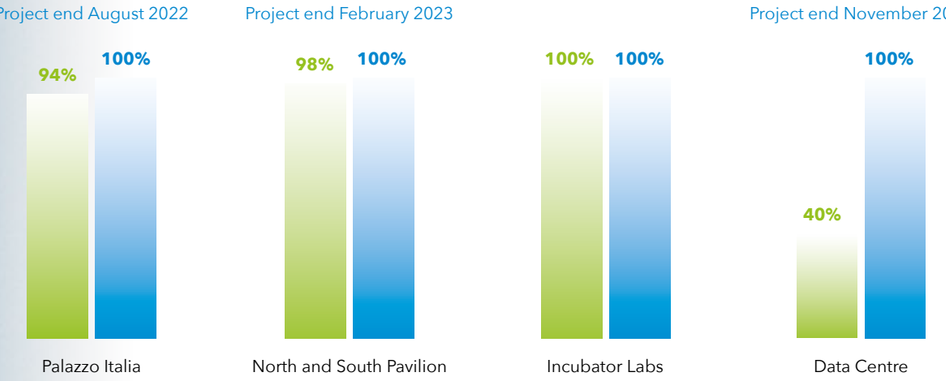
- completion of the construction of temporary facilities for an additional 4,000 square metres of dedicated laboratories and technical areas (the "Incubator Labs");
- completion of the "Technical and Financial Feasibility Project" for construction works on the "South Building", including the expansion of the preparatory works for the construction of an additional building to rationalise and centralise the technical areas and technological and generation plants (the "Technological Hub").

At the same time, the Foundation has a planned further redevelopment of the buildings acquired in 2020, again from Arexpo (Palazzo Italia and technical annexes), in order to meet growing needs in terms of office space and technical premises.
More specifically, the following was commenced:

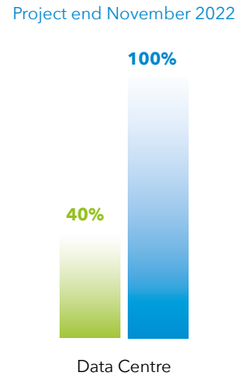
- the design of new office space in Palazzo Italia, acoustic mitigation measures and the location of the central warehouse and sample store in the basement. The Technical and Financial Feasibility Project was completed, to be followed by a special integrated tender in 2022;
- the executive design of plant and civil engineering additions to support new facilities in the South Pavilion, including biosafety level 3 (BSL3) laboratories;
- the executive design of the liquid nitrogen management infrastructure at Campus level;
- the construction of a Data Centre Facility and a 10 Gb data connectivity and networking star centre in the basement of Palazzo Italia.

The following charts show the state of progress of the construction and renovation of the buildings and the Data Centre at the end of 2021:

% PROGRESS IN INFRASTRUCTURE DEVELOPMENT PROJECTS



% PROGRESS DATA CENTRE



The following tables show the square metres allocated to research for the Campus buildings, at the end of 2021:

HT SQM DETAIL		% SQM RELATED TO RESEARCH ACTIVITIES (LABORATORIES) IN 2021
SOUTH PAVILION		
Laboratories	2,765	
NORTH PAVILION		
Laboratories	1,158	
INCUBATOR LABS		
Laboratories	3,298	41%
PALAZZO ITALIA		
Laboratories	1,067	
Offices and Facilities	11,916	

FORECAST SQM DETAIL	
SOUTH BUILDING (EXPECTED 2022-2026)	
Laboratories	15,460
Facilities	11,004
Offices	3,914

RELATIONAL CAPITAL

The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being. Social and relationship capital includes:

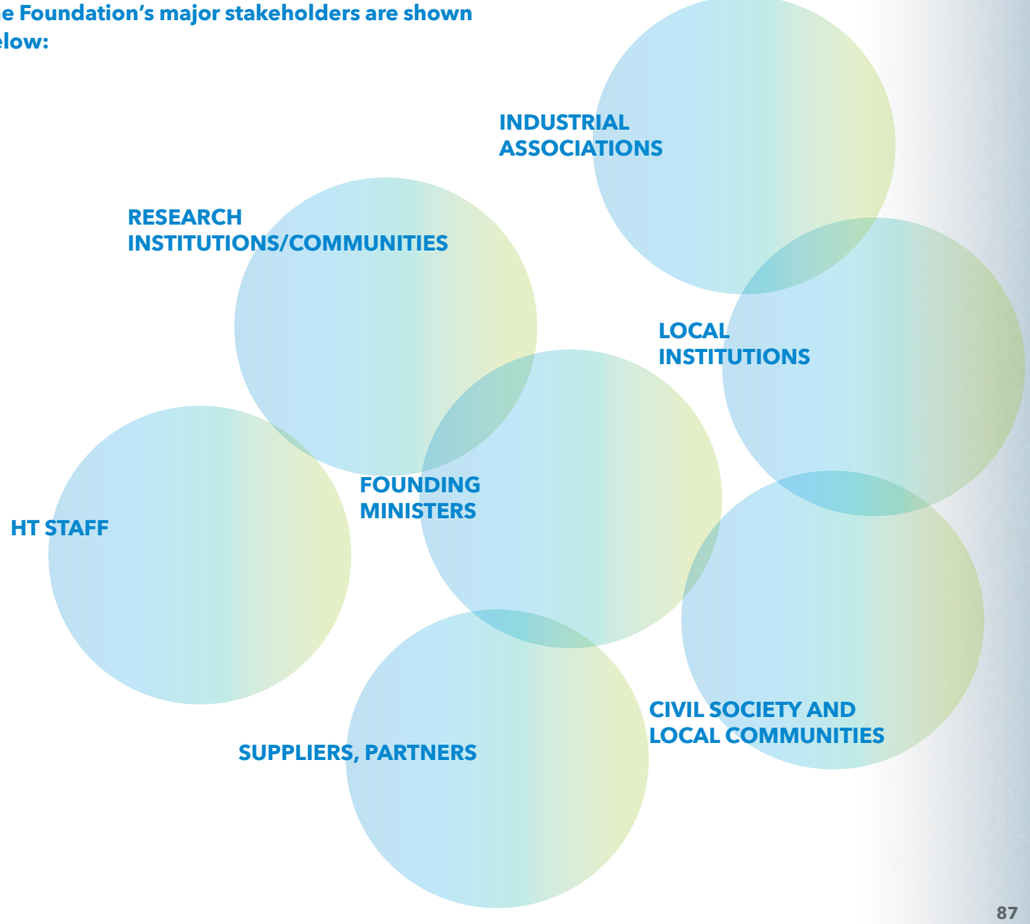
- **Shared norms, and commons values and behaviours**
- **Key stakeholder relationships, and the trust and willingness to engage that an organisation has developed and strives to build and protect with external stakeholders**
- **Intangibles associated with the brand and reputation that an organisation has developed**
- **An organisation's social licence to operate**

OUR STAKEHOLDERS

The Foundation focuses aims to maintain an inclusive approach towards stakeholders establishing strong relationships through transparent and effective communication. To do so, HT has ensured this approach through a series of structured engagements (interviews, institutional and scientific initiatives, surveys) with stakeholders.

A stakeholder mapping process forms the basis of its engagement activities, involving all internal structures. The approach to stakeholder engagement is dealt with in detail in the chapter "Stakeholder engagement and the materiality matrix" of this document.

The Foundation's major stakeholders are shown below:



Human Technopole is aware of the importance of people and the territory in which it operates. There is a constant commitment to implementing specific initiatives, both scientific and institutional, also aimed at the economic, social and cultural development of the areas in which the Foundation operates

Major stakeholder engagement initiatives include, for example, collaborations, partnerships, scientific visiting and institutional initiatives as reported below:

SCIENTIFIC PARTNERSHIPS AND COLLABORATIONS

In line with HT's intention to engage with scientific stakeholders, discussions have been started and collaborative framework agreements signed to promote interactions with industry and academia and to improve national research and innovation capacities in the areas of life sciences, agribusiness and nutrition.

HT has also started discussions with the Ministry of Health, the IRCCS networks and individual IRCCSs, which are funded by the Ministry of Health and engaged in high-level medical research.

Interactions with the surrounding research community became more intense and diversified in 2020 and 2021, following the recruitment of HT's scientific leadership, the first heads of Research Centres and Group Leaders. Their appointment triggered numerous initiatives and meetings with various players in the biomedical scientific community, eager to collaborate with HT on the basis of complementary expertise and common research goals. Concrete collaborations have been started with both academic and clinical partners, including the European Institute of Oncology, the University of Milan, the FBF-Sacco ASST of Milan, the University of Padua and the Città della Speranza Pediatric Research Institute - IRP in Padua, the IRCCS Neuromed in Molise. More specifically, in 2021 the Foundation continued its intensive interaction with the scientific community in order to foster potential areas of collaboration with universities, research centres, scientific companies and clinical research institutes. Some of these interactions led to the conclusion of collaboration agreements, such as those with the IRCCS Oasi Maria SS, the Scuola Internazionale Superiore di Studi Avanzati (SISSA), Eurac Reserarch and the Fondazione Regionale per la Ricerca Biomedica (FRBB).

HT also creates ties with and participates in consortia and collaborative research activities at european and international level.

Some of these initiatives are listed below:

- HT is an associate partner of **LifeTime**, a pan-European research initiative that aims to revolutionise healthcare by understanding and monitoring human disease at single cell resolution to transform patient care and the sustainability of healthcare systems. The LifeTime consortium brings together more than 120 leading scientists from over 90 european research institutes. The University of Milan is the official partner of the consortium, while other Italian associate partners include the European Institute of Oncology, the FIRC Foundation Institute of Molecular Oncology, the Institute of Biomedical Technologies and the Institute of Photonics and Nanotechnology of the National Research Council, as well as several leading italian universities;

- **Human Cell Atlas** is a global effort which brings together expertise in biology, medicine, genomics, technology development and computation with the goal of building a complete collection of cell maps, which characterise each of the thousands of cell types present in the human body. A systematic study of the molecular mechanisms that underlie the production, function and combined activity of different cell types would be an incredibly valuable resource for the global research community;

- The **Cancer Dependency Map** is a partnership created between the Broad Institute (USA) and the Wellcome Sanger Institute (UK) that brings together expertise, data and computational tools to systematically identify the genetic and pharmacological dependencies of cancer and the biomarkers that predict them. Initial discussions with consortium partners have been very positive and HT is expected to join the initiative in an attempt to dynamically map genetic dependencies, and those of glioblastoma in particular.

SCIENTIFIC VISITING INITIATIVES

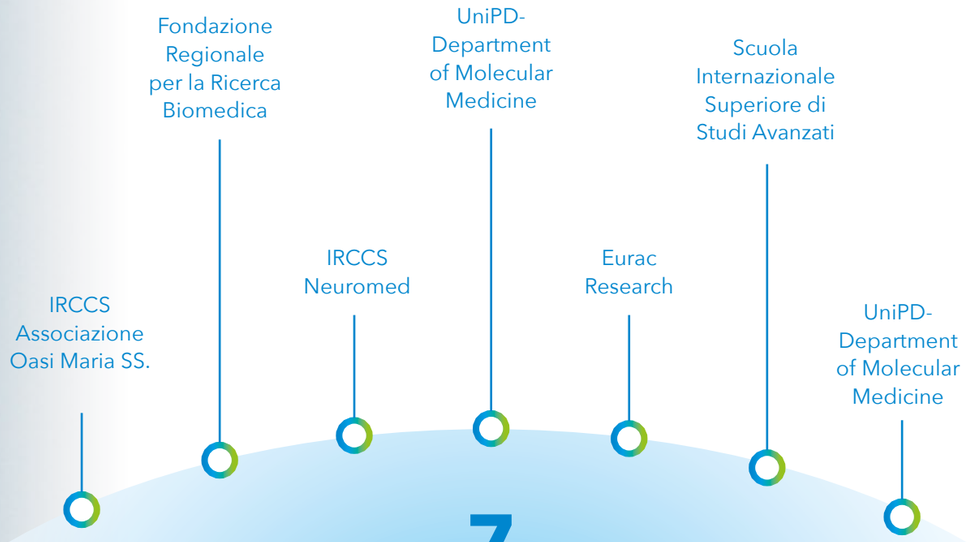
Other initiatives that bear witness to HT's commitment to the establishment of solid relations with its scientific stakeholders include scientific visiting programmes that offer research staff from the national and international scientific community the chance to spend time at HT for research collaborations.

INSTITUTIONAL INITIATIVES

HT's institutional activities help it to develop and monitor relations with national and local Government entities, European and international institutions, companies and employer associations, its neighbours at MIND – Milano Innovation District – and the stakeholders that are important to the Foundation, in order to promote, consolidate and defend its interests.

HT's Institutional Relations Department assists in the definition and implementation of the Foundation's image promotion and its activities to raise awareness of the economic and social impact of scientific research carried out at HT. It works in close contact with the Communication and Strategy and Scientific Affairs departments.

RELATIONAL CAPITAL – 2021 RESULTS



7

PARTNERSHIPS WITH SCIENTIFIC INSTITUTIONS AND ORGANISATIONS IN 2021

2021 INSTITUTIONAL INITIATIVES

THE ROLE OF CULTURE AND SCIENCE IN BOOSTING THE COUNTRY'S ECONOMY	HT and Associazione Civita organised, in the framework of the collaboration agreement signed in 2020, a discussion and debate between representatives from the worlds of research, culture, politics and industry to reflect on the potential of science and culture for the revival of the Country's economy, ahead of the presentation of the National Recovery and Resilience Plan. The event was attended, among others, by the Undersecretary of the Minister for Economic Development Anna Ascani.
SCIENCE AND CULTURE BALANCED BETWEEN CONTENT AND ENTERTAINMENT	HT and the Civita Association organised, again within the framework of the cooperation agreement signed in 2020, an event with representatives from the worlds of research, culture and politics to discuss science dissemination, as part of a broader reflection on how to rebuild trust in expertise.
INAUGURATION OF NEW MIND TOPONYMY	In order to strengthen the overall identity of the MIND area and emphasise its ambition to be a district of science and innovation, the Foundation has promoted, with the competent authorities and in agreement with the other protagonists, the proposal to name the entire toponymy of the area after scientists, researchers and personalities relevant to science and technology. The Ceremony to name the first three streets of MIND was held on 1st May 2021, in the presence of the President of the Senate Casellati, the President of the Lombardy Region Fontana and the Mayor of Milan Sala, and saw the naming of the Cardo, the HT site, after Rita Levi-Montalcini.
LIFE SCIENCES COMMUNITY AMBROSETTI	During 2021 HT scientists participated in events organised by the Community Life Sciences.

In 2021, HT's President took part as a speaker at numerous events on healthcare and research: **"Agorà - Salute è cultura"** (Agorà - Health is culture) as part of the project **"La salute in movimento"**, **"Investimento in R&S - perché conviene all'Italia"** ("Health in movement", "Investment in R&D - why it is worth it for Italy") a meeting organised by the Aspen Institute Italia, **"Ricerca, Innovazione e Formazione Universitaria"** ("University research, innovation and education") a ResPublica event, **"Sanità digitale"** ("Digital health") organised by AWARE, **"The economic consequences of the pandemic and their political implications. Italian, French, and German perspectives"** a meeting organised by the Deutsch-Französisches Institut of Ludwigsburg, **"Il Futuro Migliore"** ("The Best Future") an Assobiotech event, **"Technology Forum Life Sciences"** organised by European House Ambrosetti, **"Forum Health – the Culture of Cooperation. Rethinking Models to Create New Value"** by Fortune Italia, **"Oltre il tempo della pandemia"** ("After the pandemic"), a meeting coordinated by Confcommercio, **"SIMM National Congress"** and the event **"Invertire la rotta è possibile?"** ("Change course. Can it be done?") by Horizon Italy. The Foundation's senior management also met the heads of a number of national and local institutions, as well as scientific, industrial and civil society stakeholders, in order to raise awareness of HT's activities and their impact on the Country's economy.

HT also took part in a series of events and initiatives organised by partners at MIND (Landing AstraZeneca, Visit by the Regional Council of Lombardy, Visit by the Lombardy Regional Government), reporting on and describing the Foundation's activities.

The Foundation's relationship activities also include building a network of agreements with im-

portant partners. In this respect in 2021 HT signed a collaboration agreement with Enea Tech, joined the *Alleanza per lo Sviluppo Sostenibile* (ASviS – Alliance for Sustainable Development) and participated in the production of a video on the excellence of the Italian Life Sciences supply chain together with the Ministry of Foreign Affairs and International Cooperation.

HT also contributed to the work of the Italian G20, helping to draft a paper "Culture and sciences for life: towards a global health literacy alliance for a sustainable future" as part of the T20 activities on "Global Health and Covid-19".

HT's outreach activities took an important step forward in 2021 with the launch of initiative "HT Presents, Dialogues on science and society", a series of events to discuss science, innovation and society.

HT collaborated with the Feltrinelli Foundation and the Civita Association to organise events, workshops and seminars to discuss how science can improve our quality of life and the importance of promoting a knowledge-based society and culture.
The Foundation supported the Festival of Sciences, an annual science festival organised in cooperation with National Geographic. Representatives of HT's scientific leadership spoke at the international conference for the Italian research day in the world.

HT participated in the annual event with the Musica per Roma Foundation with three public workshops and three educational events for high school pupils and presented a proposal to the Milan City Council, together with its MIND partners, to rename the streets, squares, buildings and parks in the neighbourhood.

2021 MEDIA AND SOCIAL NETWORK PERFORMANCE

HT's communication activities are designed to increase the institute's visibility and bolster its reputation as an innovative Research Centre, attracting scientific talent from all over the world and providing high-quality science.

Furthermore, part of HT's mission is to inform public opinion of the importance of science and research and to promote science outreach to a wide variety of non-scientific stakeholders.

In 2021, HT acquired a constant presence in the main Italian media (press, TV and online). Close cooperation with its MIND partners enabled it to publicise the overall development of the innovation district, which this year saw the arrival of the first private sectors companies also in the international media (The Good Life, Bloomberg).

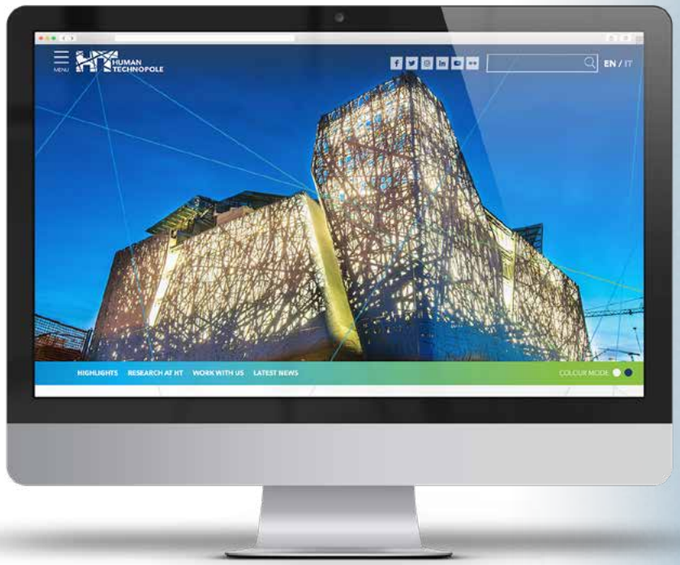
In 2021, the total number of mentions in newspapers and on the web, radio and TV was 1,766 (up 30% on 2020). Of these, 554 were the result of proactive media activity, distributed as follows:

- 19 national newspapers
- 4 national periodicals
- 16 national TV stations
- 2 national radio stations
- 385 news websites
- 10 local editions of national newspapers
- 16 local newspapers
- 5 local TV stations
- 94 press agencies

Finally, 2021 saw a significant increase in digital activity on all platforms, as follows:

PLATFORM	TOTAL FOLLOWERS AT 31.12.2021	YEAR-ON-YEAR GROWTH
TWITTER	5,615	+76.07%
LINKEDIN	14,861	+60.14%
INSTAGRAM	1,724	+35.86%
FACEBOOK	2,324	+93.83%
YOUTUBE	112	+93.10%
NEWSLETTER	1,002	+35.41%

In 2021 HT's website (HOME-HT) received more than 100,000 visits.

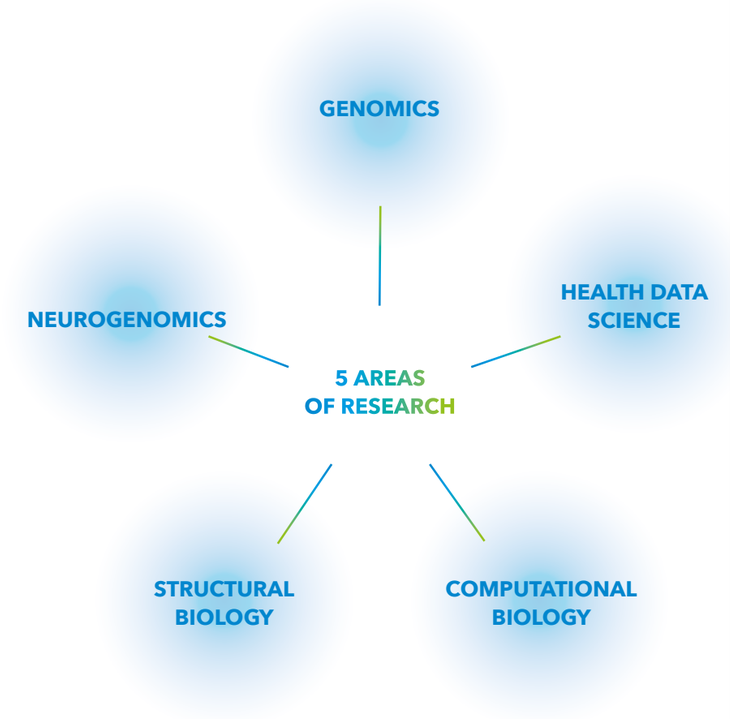


INTELLECTUAL CAPITAL

Organisational, knowledge-based intangibles, including:

- Copyrights, software, rights and licences
- "Organisational capital" such as tacit knowledge, systems, procedures and protocols

HT's research activities are organised in five different areas, each of which is supported by a Research Centre:



HT's science is interdisciplinary and is comprised of biologists, bioinformaticians, chemists, engineers, physicists, mathematicians, computer scientists and scientists with a medical background. The benefit of this breadth of available expertise, however, can only be reaped if scientists work together across disciplines to exploit the synergies between their different fields of expertise.

HT promotes and encourages interdisciplinary collaboration, by for example through the dual appointment of group leaders in more than one research centre, joint interdisciplinary doctoral and/or postdoctoral projects between centres, and the funding of jointly supervised pre or postdoctoral fellowships.

Additionally, HT carries out its research in a barrier-free environment and employs a collegial management approach, which fosters an inclusive and open culture, with extensive collaboration between different teams, the sharing of laboratories and facilities and collaboration between different centres.

INTELLECTUAL CAPITAL – 2021 RESULTS

In 2021 54 papers were published* by HT affiliated research scientists as listed below by Research Centre:

GENOMIC CENTRE

TITLE	AUTHORS	JOURNAL
Mitochondrial DNA variants modulate N-formylmethionine, proteostasis and risk of late-onset human diseases*	Na Cai, Aurora Gomez-Duran, Ekaterina Yonova-Doing, Kousik Kundu, Annette I. Burgess, Zoe J. Golder, Claudia Calabrese, Marc J. Bonder, Marta Camacho, Rachael A. Lawson, Lixin Li, Caroline H. Williams-Gray, ICICLE-PD Study Group, Emanuele Di Angelantonio, David J. Roberts, Nick A. Watkins, Willem H. Ouwehand, Adam S. Butterworth, Isobel D. Stewart, Maik Pietzner, Nick J. Wareham, Claudia Langenberg, John Danesh, Klaudia Walter, Peter M. Rothwell, Joanna M. M. Howson, Oliver Stegle, Patrick F. Chinnery & **Nicole Soranzo**	*Nat Med*
Embryonic LTR retrotransposons supply promoter modules to somatic tissues	Kosuke Hashimoto, Eeva-Mari Jouhilahti, Virpi Töhönen, **Piero Carninci**, Juha Kere, Shintaro Katayama	*Genome Res.*
SINEUPs: a novel toolbox for RNA therapeutics	Stefano Espinoza, Carlotta Bon, Paola Valentini, Bianca Pierattini, Abraham Tettey Matey, Devid Damiani, Salvatore Pulcrano, Remo Sanges, Francesca Persichetti, Hazuki Takahashi, **Piero Carninci**, Claudio Santoro, Diego Cotella, Stefano Gustincich	*Essays Biochem*
A field guide to cultivating computational biology	Gregory P Way, Casey S Greene, **Piero Carninci**, Benilton S Carvalho, Michiel de Hoon, Stacey D Finley, Sara J C Gosline, Kim-Anh Lê Cao, Jerry S H Lee, Luigi Marchionni, Nicolas Robine, Suzanne S Sindi, Fabian J Theis, Jean Y H Yang, Anne E Carpenter, Elana J Fertig	*PLoS Biol.*
The choice of negative control antisense oligonucleotides dramatically impacts downstream analysis depending on the cellular background	Luca Ducoli, Saumya Agrawal, Chung-Chau Hon, Jordan A Ramilowski, Eliane Sibler, Michihira Tagami, Masayoshi Itoh, Naoto Kondo, Imad Abugessaisa, Akira Hasegawa, Takeya Kasukawa, Harukazu Suzuki, **Piero Carninci**, Jay W Shin, Michiel J L de Hoon, Michael Detmar	*BMC Genom Data*
Analysis of Enhancer-Promoter Interactions using CAGE and RADICL-Seq Technologies	Alessandro Bonetti, Andrew Tae-Jun Kwon, Erik Arner, **Piero Carninci**	*Methods Mol Biol*
Low Quantity Single Strand CAGE (LQ-ssCAGE) Maps Regulatory Enhancers and Promoters	Hazuki Takahashi, Hiromi Nishiyori-Sueki, Jordan A Ramilowski, Masayoshi Itoh, **Piero Carninci**	*Methods Mol Biol*
Antisense RNAs during early vertebrate development are divided in groups with distinct features	Sanjana Pillay, Hazuki Takahashi, **Piero Carninci**, Aditi Kanhere	*Genome Res.*
Lipid-loaded tumor-associated macrophages sustain tumor growth and invasiveness in prostate cancer	Michela Masetti, Roberta Carriero, Federica Portale, Giulia Marelli, Nicolò Morina, Marta Pandini, Marta Iovino, Bianca Partini, Marco Erreni, Andrea Ponzetta, Elena Magrini, Piergiuseppe Colombo, Grazia Elefante, Federico Simone Colombo, Joke M M den Haan, **Clelia Peano**, Javier Cibella, Alberto Termanini, Paolo Kunderfranco, Jolanda Brummelman, Matthew Wai Heng Chung, Massimo Lazzeri, Rodolfo Hurle, Paolo Casale, Enrico Lugli, Ronald A DePinho, Subhankar Mukhopadhyay, Siamon Gordon, Diletta Di Mitri	*J Exp Med*
The Helicobacter pylori CagY Protein Drives Gastric Th1 and Th17 Inflammation and B Cell Proliferation in Gastric MALT Lymphoma	Chiara Della Bella, Maria Felicia Soluri, Simone Puccio, Marisa Benagiano, Alessia Grassi, Jacopo Bitetti, Fabio Cianchi, Daniele Sblattero, **Clelia Peano**, Mario Milco D'Elios	*Int J Mol Sci*
Interplay between Non-Coding RNA Transcription, Stringent/Relaxed Phenotype and Antibiotic Production in Streptomyces ambofaciens	Eva Pinatel, Matteo Calcagnile, Adelfia Talà, Fabrizio Damiano, Luisa Siculella, **Clelia Peano**, Giuseppe Egidio De Benedetto, Antonio Pennetta, Gianluca De Bellis, Pietro Alifano	*Antibiotics*

NEUROGENOMIC CENTRE

TITLE	AUTHORS	JOURNAL
Single cell-derived spheroids capture the self-renewing subpopulations of metastatic ovarian cancer	Tania Velletri, **Carlo Emanuele Villa**, Domenica Cilli, Bianca Barzaghi, Pietro Lo Riso, Michela Lupia, Raffaele Luongo, Alejandro López-Tobón, Marco De Simone, Raoul J P Bonnal, Luca Marelli, Stefano Piccolo, Nicoletta Colombo, Massimiliano Pagani, Ugo Cavallaro, Saverio Minucci, Giuseppe Testa	*Cell Death Differ*
Novel in vitro Experimental Approaches to Study Myelination and Remyelination in the Central Nervous System	Davide Marangon, **Nicolò Caporale**, Marta Boccazzi, Maria P Abbracchio, **Giuseppe Testa**, Davide Lecca	*Front Cell Neurosci*
Big Tech Platforms in Health Research: Re-purposing Big Data Governance in Light of the GDPR's Research Exemption	Luca Marelli, **Giuseppe Testa**, Ine Van Hoyweghen	*SSRN*
Inheritance and flexibility of cell polarity: a clue for understanding human brain development and evolution	**Nereo Kalebic**, Takashi Namba	*Development*
The Ferret as a Model System for Neocortex Development and Evolution	Carlotta Gilardi, **Nereo Kalebic**	*Front Cell Dev Biol*
NGN2 induces diverse neuron types from human pluripotency	Hsiu-Chuan Lin, Zhisong He, Sebastian Ebert, Maria Schörnig, Malgorzata Santel, Marina T. Nikolova, Anne Weigert, Wulf Hevers, Nael Nadif Kasri, **Elena Taverna**, J. Gray Camp, Barbara Treutlein	*Stem Cell Report*

STRUCTURAL BIOLOGY CENTRE

TITLE	AUTHORS	JOURNAL
MCPH1 inhibits Condensin II during interphase by regulating its SMC2-Kleisin interface	Martin Houlard, Erin E Cutts, Muhammad S Shamim, Jonathan Godwin, David Weisz, Aviva Presser Aiden, Erez Lieberman Aiden, Lothar Schermelleh, **Alessandro Vannini**, Kim Nasmyth	*Elife*
Structural basis of Ty3 retrotransposon integration at RNA Polymerase III-transcribed genes	Guillermo Abascal-Palacios, Laura Jochem, Carlos Pla-Prats, Fabienne Beuron, **Alessandro Vannini**	*Nat Commun*
Linker histone H1.8 inhibits chromatin binding of condensins and DNA topoisomerase II to tune chromosome length and individualization	Pavan Choppakatla, Bastiaan Dekker, Erin E Cutts, **Alessandro Vannini**, Job Dekker, Hironori Funabiki	*Elife*
A WDR35-dependent coat protein complex transports ciliary membrane cargo vesicles to cilia	Tooba Quidwai, Jiaolong Wang, Emma A Hall, Narcis A Petriman, Weihua Leng, Petra Kiesel, Jonathan N Wells, Laura C Murphy, Margaret A Keighren, Joseph A Marsh, Esben Lorentzen, **Gaia Pigino**, Pleasantine Mill	*Elife*
In vivo imaging shows continued association of several IFT-A, IFT-B and dynein complexes while IFT trains U-turn at the tip	Jenna L Wingfield, Betlehem Mekonnen, Ilaria Mengoni, Peiwei Liu, Mareike Jordan, Dennis Diener, **Gaia Pigino**, Karl Lechtreck	*J Cell Sci*
The structural basis of intraflagellar transport at a glance	Mareike A Jordan, **Gaia Pigino**	*J Cell Sci*
Intraflagellar transport	**Gaia Pigino**	*Curr Biol*
Tubulin glycylation controls axonemal dynein activity, flagellar beat, and male fertility	Sudarshan Gadadhar, Gonzalo Alvarez Viar, Jan Niklas Hansen, An Gong, Aleksandr Kostarev, Côme Ialy-Radio, Sophie Leboucher, Marjorie Whitfield, Ahmed Ziyyat, Aminata Touré, Luis Alvarez, **Gaia Pigino**, Carsten Janke	*Science (with Cover)*
Ccdc113/Ccdc96 complex, a novel regulator of ciliary beating that connects radial spoke 3 to dynein g and the nexin link	Bazan R, Schröfel A, Joachimiak E, Poprzeczko M, **Pigino G**, Wloga D.	*PLoS Genet*
Thermally Driven Membrane Phase Transitions Enable Content Reshuffling in Primitive Cells	Roger Rubio-Sánchez, Derek K O'Flaherty, Anna Wang, **Francesca Coscia**, Gianluca Petris, Lorenzo Di Michele, Pietro Cicuta, Claudia Bonfio	*J Am Chem Soc*
Integrated Cryo-Correlative Microscopy for Targeted Structural Investigation In Situ	Marit Smeets, Anna Bieber, Cristina Capitanio, Oda Schioetz, Thomas van der Heijden, Andries Effting, Éric Piel, Éric Piel, Bassim Lazem, **Philipp Erdmann**, Juergen Plitzko	*Microscopy Today*

COMPUTATIONAL BIOLOGY CENTRE

TITLE	AUTHORS	JOURNAL
Functional Impact of Genomic Complexity on the Transcriptome of Multiple Myeloma	Bachisio Ziccheddu, Matteo C Da Vià, Marta Lionetti, Akihiro Maeda, Silvia Morlupi, Matteo Dugo, Katia Todoerti, Stefania Oliva, Mattia D'Agostino, Paolo Corradini, Ola Landgren, **Francesco Iorio**, Loredana Pettine, Alessandra Pompa, Martina Manzoni, Luca Baldini, Antonino Neri, Francesco Maura, Niccolò Bolli	*Clin Cancer Res*
Integrated cross-study datasets of genetic dependencies in cancer	Clare Pacini, Joshua M Dempster, Isabella Boyle, Emanuel Gonçalves, Hanna Najgebauer, Emre Karakoc, Dieudonne van der Meer, Andrew Barthorpe, Howard Lightfoot, Patricia Jaaks, James M McFarland, Mathew J Garnett, Aviad Tsherniak, **Francesco Iorio**	*Nat Commun*
Combinatorial CRISPR screen identifies fitness effects of gene paralogues	Nicola A Thompson, Marco Ranzani, Louise van der Weyden, Vivek Iyer, Victoria Offord, Alastair Droop, Fiona Behan, Emanuel Gonçalves, Anneliese Speak, **Francesco Iorio**, James Hewinson, Victoria Harle, Holly Robertson, Elizabeth Anderson, Beiyuan Fu, Fengtang Yang, Guido Zagnoli-Vieira, Phil Chapman, Martin Del Castillo Velasco-Herrera, Mathew J Garnett, Stephen P Jackson, David J Adams	*Nat Commun*
Minimal genome-wide human CRISPR-Cas9 library	Emanuel Gonçalves, Mark Thomas, Fiona M Behan, Gabriele Picco, Clare Pacini, Felicity Allen, **Alessandro Vinceti**, Mamta Sharma, David A Jackson, Stacey Price, Charlotte M Beaver, Oliver Dovey, David Parry-Smith, **Francesco Iorio**, Leopold Parts, Kosuke Yusa, Mathew J Garnett	*Genome Biol*
Project Score database: a resource for investigating cancer cell dependencies and prioritizing therapeutic targets	Lisa Dwane, Fiona M Behan, Emanuel Gonçalves, Howard Lightfoot, Wanjuan Yang, Dieudonne van der Meer, Rebecca Shepherd, Miguel Pignatelli, **Francesco Iorio**, Mathew J Garnett	*Nucleic Acids Res*
Analysis of CRISPR-Cas9 screens identifies genetic dependencies in melanoma	Eirini Christodoulou, Mamunur Rashid, Clare Pacini, Alastair Droop, Holly Robertson, Tim van Groningen, Amina F A S Teunisse, **Francesco Iorio**, Aart G Jochemsen, David J Adams, Remco van Doorn	*Pigment Cell Melanoma Res*
CoRe: a robustly benchmarked R package for identifying core-fitness genes in genome-wide pooled CRISPR-Cas9 screens	**Alessandro Vinceti**, Emre Karakoc, Clare Pacini, **Umberto Perron**, **Riccardo Roberto De Lucia**, Mathew J Garnett, **Francesco Iorio**	*BMC Genomics*
Democratising deep learning for microscopy with ZeroCostDL4Mic	Lucas von Chamier, Romain F Laine, Johanna Jukkala, Christoph Spahn, Daniel Krentzel, Elias Nehme, Martina Lerche, Sara Hernández-Pérez, Pieta K Mattila, Eleni Karinou, Séamus Holden, Ahmet Can Solak, Alexander Krull, Tim-Oliver Buchholz, Martin L Jones, Loïc A Royer, Christophe Leterrier, Yoav Shechtman, **Florian Jug**, Mike Heilemann, Guillaume Jacquemet, Ricardo Henriques	*Nat Commun*
3D FIB-SEM reconstruction of microtubule-organelle interaction in whole primary mouse β cells	Andreas Müller, Deborah Schmidt, C Shan Xu, Song Pang, Joyson Verner D'Costa, Susanne Kretschmar, Carla Münster, Thomas Kurth, **Florian Jug**, Martin Weigert, Harald F Hess, Michele Solimena	*J Cell Biol*
Embedding-based Instance Segmentation in Microscopy	Manan Lalit, Pavel Tomancak, **Florian Jug**	*Proceedings of Machine Learning Research*
The ImageJ ecosystem: Open-source software for image visualization, processing, and analysis	Alexandra B Schroeder, Ellen T A Dobson, Curtis T Rueden, Pavel Tomancak, **Florian Jug**, Kevin W Eliceiri	*Protein Sci*
Sample Preparation by 3D-Correlative Focused Ion Beam Milling for High-Resolution Cryo-Electron Tomography	Anna Bieber, Cristina Capitanio, Florian Wilfling, Jürgen Plitzko, **Philipp S Erdmann**	*J Vis Exp*
In situ cryo-electron tomography reveals gradient organization of ribosome biogenesis in intact nucleoli	**Philipp S Erdmann**, Zhen Hou, Sven Klumpe, Sagar Khavnekar, Florian Beck, Florian Wilfling, Jürgen M Plitzko, Wolfgang Baumeister	*Nat Commun*
Deposition-free Cryo-FIB Lift-out Transfer for Cryo-Electron Tomography Specimen Preparation	Jürgen Plitzko, **Philipp S Erdman**, Sven Klumpe	*Microsc. Microanal.*
Epistasis, aneuploidy, and functional mutations underlie evolution of resistance to induced microtubule depolymerization	Mattia Pavani, Paolo Bonaiuti, Elena Chiroli, Fridolin Gross, Federica Natali, Francesca Macaluso, Ádám Póti, **Sebastiano Pasqualato**, Zoltán Farkas, Simone Pompei, Marco Cosentino Lagomarsino, Giulia Rancati, Dávid Szüts, Andrea Ciliberto	*EMBO J*

HEALTH DATA SCIENCE

TITLE	AUTHORS	JOURNAL
Integrative analysis of the plasma proteome and polygenic risk of cardiometabolic diseases	Scott C Ritchie, Samuel A Lambert, Matthew Arnold, Shu Mei Teo, Sol Lim, Petar Scepanovic, Jonathan Marten, Sohail Zahid, Mark Chaffin, Yingying Liu, Gad Abraham, Willem H Ouwehand, David J Roberts, Nicholas A Watkins, Brian G Drew, Anna C Calkin, **Emanuele Di Angelantonio**, Nicole Soranzo, Stephen Burgess, Michael Chapman, Sekar Kathiresan, Amit V Khera, John Danesh, Adam S Butterworth, Michael Inouye	*Nat Metab*
Novel longitudinal Multiple Overall Toxicity (MOTox) score to quantify adverse events experienced by patients during chemotherapy treatment: a retrospective analysis of the MRC BO06 trial in osteosarcoma	Marta Spreafico, **Francesca Ieva**, Francesca Arlati, Federico Capello, Federico Fatone, Filippo Fedeli, Gianmarco Genalti, Jakob Anninga, Hans Gelderblom, Marta Fiocco	*BMJ Open*
A Functional Data Analysis Approach to Left Ventricular Remodeling Assessmen	Letizia Clementi, Caterina Gregorio, Laura Savare, **Francesca Ieva**, Marco D Santambrogio, Laura M Sangalli	*EMBC*
[18 F]FMCH PET/CT biomarkers and similarity analysis to refine the definition of oligometastatic prostate cancer	Martina Sollini, Francesco Bartoli, Lara Cavinato, **Francesca Ieva**, Alessandra Ragni, Andrea Marciano, Roberta Zanca, Luca Galli, Fabiola Paiar, Francesco Pasqualetti, Paola Anna Erba	*EJNMMI Res*
Virtual Biopsy for Diagnosis of Chemotherapy-Associated Liver Injuries and Steatohepatitis: A Combined Radiomic and Clinical Model in Patients with Colorectal Liver Metastases	Guido Costa, Lara Cavinato, Chiara Masci, Francesco Fiz, Martina Sollini, Letterio Salvatore Politi, Arturo Chiti, Luca Balzarini, Alessio Aghemo, Luca di Tommaso, **Francesca Ieva**, Guido Torzilli, Luca Viganò	*Cancers*
Chemotherapy-Associated Liver Injuries: Unmet Needs and New Insights for Surgical Oncologists	Luca Vigano, Martina Sollini, **Francesca Ieva**, Francesco Fiz, Guido Torzilli	*Ann Surg Oncol*

TITLE	AUTHORS	JOURNAL
Development of a method for generating SNP interaction-aware polygenic risk scores for radiotherapy toxicity	Nicola Rares Franco, Michela Carlotta Massi, **Francesca Ieva**, Andrea Manzoni, Anna Maria Paganoni, Paolo Zunino, Liv Veldeman, Piet Ost, Valérie Fonteyne, Christopher J Talbot, Tim Rattay, Adam Webb, Kerstie Johnson , Maarten Lambrecht, Karin Haustermans, Gert De Meerleer, Dirk de Ruysscher, Ben Vanneste, Evert Van Limbergen, Ananya Choudhury, Rebecca M Elliott, Elena Sperk, Marlon R Veldwijk, Carsten Herskind, Barbara Avuzzi, Barbara Noris Chiorda, Riccardo Valdagni, David Azria, Marie-Pierre Farcy-Jacquet, Muriel Brengues, Barry S Rosenstein, Richard G Stock, Ana Vega, Miguel E Aguado-Barrera, Paloma Sosa-Fajardo, Alison M Dunning, Laura Fachal, Sarah L Kerns, Debbie Payne, Jenny Chang-Claude, Petra Seibold, Catharine M L West, Tiziana Rancati, REQUITE Consortium Collaborators	*Radiother Oncol*
Functional modeling of recurrent events on time-to-event processes	Marta Spreafico, **Francesca Ieva**	*Biom J*
Dynamic monitoring of the effects of adherence to medication on survival in heart failure patients: A joint modeling approach exploiting time-varying covariates	Marta Spreafico, **Francesca Ieva**	*Biom J*
Feature Selection for Imbalanced Data with Deep Sparse Autoencoders Ensemble	**Michela Carlotta Massi**, Francesca Gasperoni, **Francesca Ieva**, **Anna Maria Paganoni**	*Statistical Analysis and Data Mining*
Learning Signal Representations for EEG Cross-Subject Channel Selection and Trial Classification	**Michela C Massi**, **Francesca Ieva**	*IEEE*

**The publications listed include reviews and peer-reviewed research articles*

In 2021, we report 8 cohort studies (research projects in which groups of people are studied over a certain period of time) and 18 new experimental methods and protocols developed with the participation of HT affiliated research workers:

COHORT STUDIES

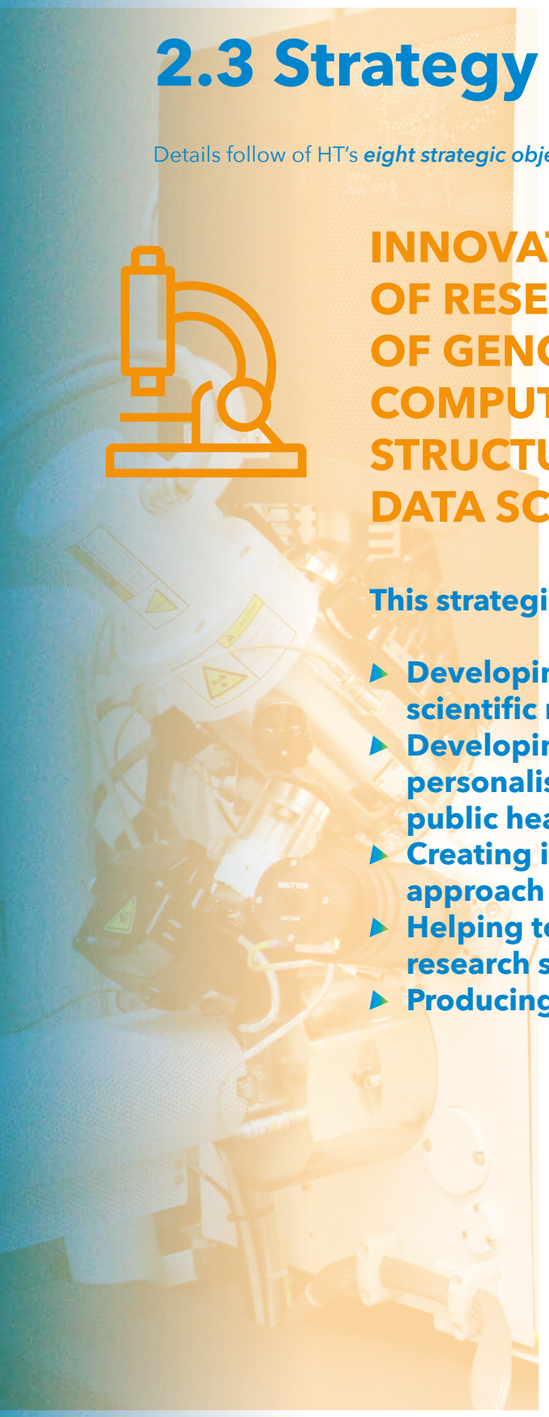
COHORT STUDY TITLE	AUTHORS	JOURNAL
Mitochondrial DNA variants modulate N-formylmethionine, proteostasis and risk of late-onset human diseases	Na Cai, Aurora Gomez-Duran, Ekaterina Yonova-Doing, Kousik Kundu, Annette I. Burgess, Zoe J. Golder, Claudia Calabrese, Marc J. Bonder, Marta Camacho, Rachael A. Lawson, Lixin Li, Caroline H. Williams-Gray, ICICLE-PD Study Group, Emanuele Di Angelantonio, David J. Roberts, Nick A. Watkins, Willem H. Ouwehand, Adam S. Butterworth, Isobel D. Stewart, Maik Pietzner, Nick J. Wareham, Claudia Langenberg, John Danesh, Klaudia Walter, Peter M. Rothwell, Joanna M. M. Howson, Oliver Stegle, Patrick F. Chinnery & **Nicole Soranzo**	*Nature Medicine*
Functional Impact of Genomic Complexity on the Transcriptome of Multiple Myeloma	Bachisio Ziccheddu, Matteo C Da Via, Marta Lionetti, Akihiro Maeda, Silvia Morlupi, Matteo Dugo, Katia Todoerti, Stefania Oliva, Mattia D'Agostino, Paolo Corradini, Ola Landgren, **Francesco Iorio,** Loredana Pettine, Alessandra Pompa, Martina Manzoni, Luca Baldini, Antonino Neri, Francesco Maura, Niccolò Bolli	*Clin Cancer Research*
Integrative analysis of the plasma proteome and polygenic risk of cardiometabolic diseases	Scott C Ritchie, Samuel A Lambert, Matthew Arnold, Shu Mei Teo, Sol Lim, Petar Scepanovic, Jonathan Marten, Sohail Zahid, Mark Chaffin, Yingying Liu, Gad Abraham, Willem H Ouwehand, David J Roberts, Nicholas A Watkins, Brian G Drew, Anna C Calkin, **Emanuele Di Angelantonio**, Nicole Soranzo, Stephen Burgess, Michael Chapman, Sekar Kathiresan, Amit V Khera, John Danesh, Adam S Butterworth, Michael Inouye	*Nature Metabolism*
Novel longitudinal Multiple Overall Toxicity (MOTox) score to quantify adverse events experienced by patients during chemotherapy treatment: a retrospective analysis of the MRC BO06 trial in osteosarcoma	Marta Spreafico, **Francesca Ieva**, Francesca Arlati, Federico Capello, Federico Fatone, Filippo Fedeli, Gianmarco Genalti, Jakob Anninga, Hans Gelderblom, Marta Fiocco	*BMJ Open*
[18 F] FMCH PET/CT biomarkers and similarity analysis to refine the definition of oligometastatic prostate cancer	Martina Sollini, Francesco Bartoli, Lara Cavinato, **Francesca Ieva**, Alessandra Ragni, Andrea Marciano, Roberta Zanca, Luca Galli, Fabiola Paiar, Francesco Pasqualetti, Paola Anna Erba	*EJNMMI Research*
Virtual Biopsy for Diagnosis of Chemotherapy-Associated Liver Injuries and Steatohepatitis: A Combined Radiomic and Clinical Model in Patients with Colorectal Liver Metastases	Guido Costa, Lara Cavinato, Chiara Masci, Francesco Fiz, Martina Sollini, Letterio Salvatore Politi, Arturo Chiti, Luca Balzarini, Alessio Aghemo, Luca di Tommaso, **Francesca Ieva**, Guido Torzilli, Luca Viganò	*Cancers*
Development of a method for generating SNP interaction-aware polygenic risk scores for radiotherapy toxicity	Nicola Rares Franco, Michela Carlotta Massi, **Francesca Ieva**, Andrea Manzoni, Anna Maria Paganoni, Paolo Zunino, Liv Veldeman, Piet Ost, Valérie Fonteyne, Christopher J Talbot, Tim Rattay, Adam Webb, Kerstie Johnson , Maarten Lambrecht, Karin Haustermans, Gert De Meerleer, Dirk de Ruysscher, Ben Vanneste, Evert Van Limbergen, Ananya Choudhury, Rebecca M Elliott, Elena Sperk, Marlon R Veldwijk, Carsten Herskind, Barbara Avuzzi, Barbara Noris Chiorda, Riccardo Valdagni, David Azria, Marie-Pierre Farcy-Jacquet, Muriel Brengues, Barry S Rosenstein, Richard G Stock, Ana Vega, Miguel E Aguado-Barrera, Paloma Sosa-Fajardo, Alison M Dunning, Laura Fachal, Sarah L Kerns, Debbie Payne, Jenny Chang-Claude, Petra Seibold, Catharine M L West, Tiziana Rancati, REQUITE Consortium Collaborators	*Radiother Oncology*
Functional modeling of recurrent events on time-to-event processes	Marta Spreafico, **Francesca Ieva**	*Biometrical Journal*

NEW EXPERIMENTAL METHODS AND PROTOCOLS

TITLE	HT AUTHORS	DESCRIPTION
Minimal genome-wide human CRISPR-Cas9 library	Vinceti, Iorio	Design of an optimised minimal genome-wide library with two sgRNAs per gene (MinLibCas9) that allows for backward compatibility with large resources of CRISPR-Cas9 screens of cancer cell models
Project Score database: a resource for investigating cancer cell dependencies and prioritizing therapeutic targets	Iorio	Uses genome-wide CRISPR-Cas9 dropout screening data in hundreds of highly annotated cancer cell models to identify genes required for cell fitness and prioritize novel oncology targets Development of an R package implementing existing and novel methods for the identification of core-fitness genes (at two different level of stringency) from joint analyses of multiple CRISPR-Cas9 screens
CoRe: a robustly benchmarked R package for identifying core-fitness genes in genome-wide pooled CRISPR-Cas9 screens	Iorio	Development of an R package implementing existing and novel methods for the identification of core-fitness genes (at two different level of stringency) from joint analyses of multiple CRISPR-Cas9 screens
Embedding-based Instance Segmentation in Microscopy	Jug	Developing a segmentation method for microscopy image analysis
Democratising deep learning for microscopy with ZeroCostDL4Mic.	Jug	Development of a Deep Learning-based platform for image analysis
Deposition-free Cryo-FIB Lift-out Transfer for Cryo-Electron Tomography Specimen Preparation.	Erdmann	Protocol for Cryo-EM sample preparation
Integrated Cryo-Correlative Microscopy for Targeted Structural Investigation In Situ	Erdmann	Development of a microscopy solution that streamlines the correlative cryo-ET workflow
Sample Preparation by 3D-Correlative Focused Ion Beam Milling for High-Resolution Cryo-Electron Tomography	Erdmann	Protocol for Cryo-EM sample preparation
Single cell-derived spheroids capture the self-renewing subpopulations of metastatic ovarian cancer	Villa	New method to isolate and grow single cells directly from patients' metastatic ascites.
SINEUPs: a novel toolbox for RNA therapeutics	Carninci	Protocol for Cryo-EM sample preparation
Analysis of Enhancer-Promoter Interactions using CAGE and RADICL-Seq Technologies	Carninci	Novel methodology to map genome-wide RNA–chromatin interactions in intact nuclei
Novel longitudinal Multiple Overall Toxicity (MOTox) score to quantify adverse events experienced by patients during chemotherapy treatment: a retrospective analysis of the MRC BO06 trial in osteosarcoma	Ieva	Development of a novel longitudinal method that can be applied to any cancer studies with CTCAE-graded toxicity data
A Functional Data Analysis Approach to Left Ventricular Remodeling Assessment	Ieva	Development of a novel analysis approach based on functional data analysis to evaluate myocardial contractility
Development of a method for generating SNP interaction-aware polygenic risk scores for radiotherapy toxicity	Ieva	Development of a new method for polygenic risk score messurement incorporating SNP-SNP interactions
Functional modeling of recurrent events on time-to-event processes	Spreafico, Ieva	Novel methodology to model patient survival with relevant dynamic features
Dynamic monitoring of the effects of adherence to medication on survival in heart failure patients: A joint modeling approach exploiting time-varying covariates	Spreafico, Ieva	Define a new personalized monitoring tool exploiting time-varying definition of adherence to medication, within a joint modeling approach
Feature Selection for Imbalanced Data with Deep Sparse Autoencoders Ensemble	Massi, Ieva & Spreafico	Development of a filtering algorithm for the analysis of radiogenomic data
Learning Signal Representations for EEG Cross-Subject Channel Selection and Trial Classification	Massi, Ieva	Development of an algorithm for the analysis of ElectroEncephaloGraphy recording

2.3 Strategy

Details follow of HT's ***eight strategic objectives***:



INNOVATION AND QUALITY OF RESEARCH IN THE AREAS OF GENOMICS, NEUROGENOMICS, COMPUTATIONAL BIOLOGY, STRUCTURAL BIOLOGY, HEALTH DATA SCIENCE

This strategic objective comprises the following steps:

- **Developing outstanding national and international scientific research programmes**
- **Developing new approaches to preventive and personalised medicine and new strategies to support public health**
- **Creating innovation through an interdisciplinary approach**
- **Helping to promote the Italian biomedical research system**
- **Producing high-quality scientific publications**

There are five large complementary areas used for biomedical and health research forming the basis of the HT research strategy for the period 2020-2024.

These areas are represented by the five Research Centres that HT has set up in the following fields:

GENOMICS

Genomics is an essential component of modern biomedicine. In general, research in this area aims to identify the mechanisms regulating gene expression and the way in which hereditary genetic material gives rise to important differences between individuals affecting health and well-being. Genome research in HT is extensive and formed by two complementary research programmes: one covering functional genomics and the other medical and population genomics. One of the main objectives of this type of research is to help characterise Italy's genetic variability and unique environment so as to improve our understanding of the genetic causes of various diseases common amongst the population, unleashing additional potential for both research and clinical purposes.

NEUROGENOMICS

Neurogenomics is another very important area of research for HT, also bearing in mind that neurological disorders are a considerable burden on the health service. At the same time, neurogenomics is an area of research in which significant benefits resulting from the integration of genomics, disease modelling and other cutting-edge methods are waiting to be gained. In particular, the application of new technology to the study of neurogenomics is intended to complement and create synergies with high-profile national and European research programmes and activities. HT's neurogenomic research combines computational and experimental approaches using different systems to investigate the nervous system's structure/function and development with a special focus on the mechanisms underlying neuropsychiatric and neurodegenerative disorders. Research in this area provides detailed insight into molecular function, as well as representing a crucial first step in new drug design.

STRUCTURAL BIOLOGY

HT's scientific strategy leans strongly towards structural biology that focuses on studying the three-dimensional structure of macromolecules. In addition to the importance of these studies, oriented towards the discovery of disease-regulating mechanisms, the strategic focus on structural biology is also motivated by the possibility for HT to grant access, through its Cryo-Electron Microscopy Facility, to a recent revolutionary technology in the field of structural biology research that is not yet widely available to Italian scientists due to its high cost and technical complexity.

COMPUTATIONAL BIOLOGY

Research in the areas described above generates huge amounts of data. It therefore becomes necessary to have close integration with computational biology research that is absolutely essential to every aspect of modern life science research. HT computational biologists use statistical, computational and bioinformatic approaches to develop solutions for large-scale data analysis, management and integration to support all research areas. In the area of computational biology, HT also plans to develop, host and manage software tools and data resources to be made available to the wider biomedical community. The aim is both to provide a service to the outside community and link publicly-accessible international biomolecular data to more limited national medical informatic data.

HEALTH DATA SCIENCE

Statistical and big data methods can be used to analyse different types of large-scale data (e.g. regarding treatment effectiveness and economic and social behaviour) or analyse and solve public health problems. HT's primary research objective in this field is to integrate big data from various sources to develop tools in support of the medical system, in particular, the areas of precision medicine and health and health economics management. So this is an innovative research area of great interest, even though quite different in nature from other types of HT research. Another HT objective for this type of research is to transfer this knowledge by providing analysis and advice to different stakeholders, but especially the Legislator, as the design and implementation of model systems to assess the socioeconomic impact on the national health system of various aspects of precision medicine can be important tools in helping to design policies that optimise efforts in the above-mentioned areas.

It is already possible to identify potential areas for HT's future development that are of great importance and represent an ideal addition for further strengthening of HT's scientific activity, maximising the potential impact on human health.

Such research areas are, for example, cell biology and metabolism. Cell biology, represents the natural missing link between understanding molecular structures and mechanisms (provided, for example, by structural biology) and the information obtained from large-scale (gen)omic studies of structures and mechanisms that operate at the organism level. Integration of these different disciplines will enable HT scientists to gain an in-depth, holistic understanding of the mechanisms regulating human health and their deregulation in disease.
With a view to maximising synergies with the rest of HT's planned activities, the Centre for Metabolism will focus on areas related to the human metabolism and microbiome and the resultant individual response to the intake of food, medicines and microbes. This is an emerging and extremely promising aspect of human biomedicine that fits in well with other research, making optimal use of both genomics and other high-throughput technology, as well as computational biology infrastructures and expertise.

HT's research work will advance our understanding of diseases and help to develop new therapeutic strategies (including ATMPs - Advanced Therapy Medicinal Products) for chronic and degenerative ones such as:

- cancer, cardiovascular disease and their intermediate phenotypes;
- neurodegenerative and neurodevelopmental disorders, such as autism and intellectual disabilities;
- rare diseases, such as primary ciliary dyskinesia;
- respiratory diseases, such as cystic fibrosis.

Some of these diseases, especially cancer, neuropsychiatric disorders and cardiovascular disease, are amongst the main causes of death in the world and, above all, have an enormous impact on healthcare systems in terms of social cost. Therefore, finding a cure for these diseases is one of the greatest challenges facing contemporary medicine.
More specifically, the first key strategic initiatives that the research team has vowed to implement are as follows:

- genomic projects to improve understanding of genetic diversity and disease predisposition in Italy - Complete genomic characterisation of the participants in the "Moli-sani" study conducted by the Neuromed IRCCS (Treatment and Research Hospital) Mediterranean Neurological Institute;
- high-throughput brain organoid longitudinal profiling for neurodevelopmental disease deconvolution of cohorts from the Associazione Oasi Maria Santissima IRCCS (Treatment and Research Hospital) in Troina, Sicily;
- machine-learning-based data mining of the Italian health insurance card system with the aim of analysing personal health data in the system that contains details and medical expenditure of every citizen and thus implement a data mining framework to identify statistical associations between underlying variables and study disease comorbidities and pharmacoepidemiological trends;
- development of key genomic and single-cell technologies to analyse genome and transcriptome structure and regulation;
- development of bioinformatic tools and databases, while promoting an open science culture, for data storage, recovery, curation and analysis;
- cancer functional genomics and translational bioinformatics with a view to generating computational models of biological pathways and networks regulating cancer initiation and progression.

Taken as a whole, the plans outlined above will provide HT with the tools needed to study an extensive range of human diseases and tackle some of today's major health challenges.
In facing these great challenges, HT's objectives overlap with the mission areas selected by the European Commission, i.e. the global societal challenges that have been recently identified and declared an integral part of the Horizon Europe framework programme launched in 2021.

HT will pay close attention to EU missions and priorities, envisaging that some of its specific research lines and projects will be able to tap into mission-specific schemes.
Furthermore, HT aims to be agile, continuing with the ability to turn its skills to new and emerging health problems following unforeseen events.
An important example regards HT's collaborative efforts in studying COVID-19.

While HT's research does not have a long-term strategic focus on virology, immunology, epidemiology or infectious diseases, in response to the recent ongoing emergency situation caused by the spread of the Sars-CoV-2 virus, HT scientists have set up a number of projects and partnerships with important research institutes and clinics both in Italy and abroad, in particular as regards genetic and (single-cell) transcriptomic analysis of virus response and population stratification in order to study COVID-19 epidemiology and dynamics.

These studies are essential to understanding the mechanism and progression of the Sars-CoV-2 infection, as well as identifying potential associations with infection susceptibility and disease severity in order to pinpoint new biomarkers, predict disease course and repurpose existing drugs to guide the host response to the virus in a patient-specific manner.

These studies continue in a manner that is consistent and integrated with the efforts of a number of international COVID-19-related initiatives in which our scientists are involved, e.g. European LifeTime FET Flagship and COVID-19 Host Genetic Initiative, to ensure that results can be shared, integrated and analysed so as to yield the most meaningful and valuable information to everyone fighting the pandemic. These efforts undertaken by our scientists are a perfect illustration of HT's collaborative culture and how its broad-based research approach, expertise and methods can be leveraged to contribute to a variety of human health related problems.

DEVELOPMENT AND PROVISION OF INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS

More specifically, the main aims of this strategic objective are as follows:

- To provide high quality infrastructures, instruments and services
- To guarantee high quality in research centres and areas
- To offer external and internal researchers access to infrastructures instruments and services

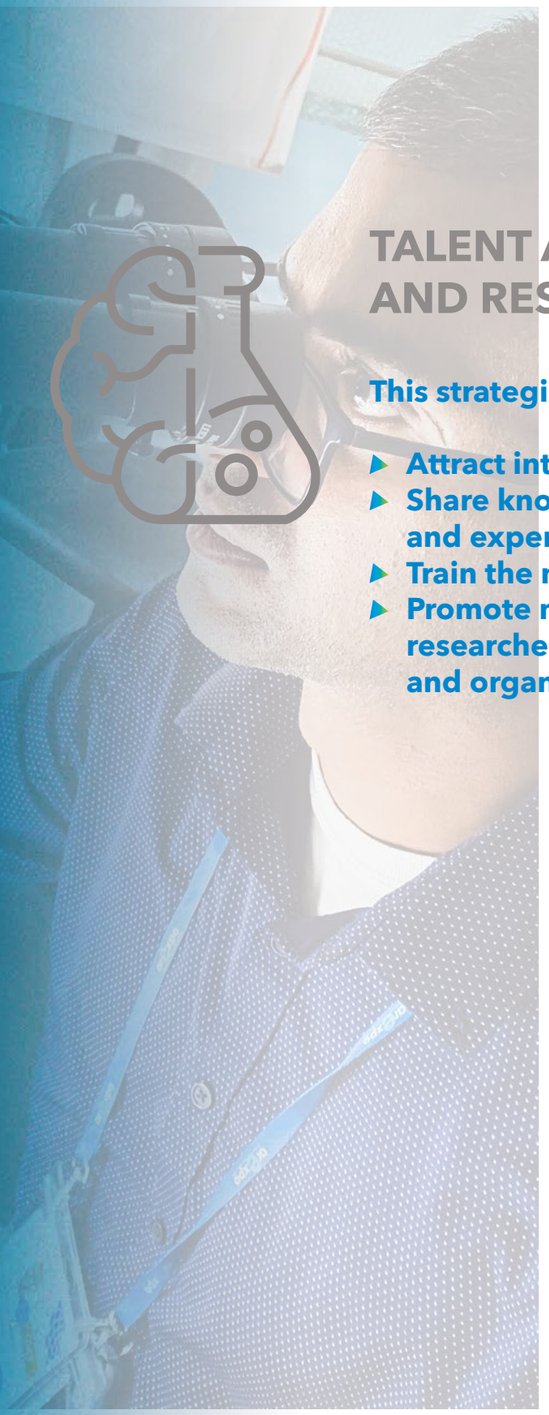
Research at HT will be supported by state-of the-art scientific infrastructures and Facilities that are essential to remaining competitive in the current international research scene and will be accessible to internal and external users. Besides meeting the requirements of HT scientists, these facilities and services will be widely available to the external scientific community. HT's plans in the area of user-accessible scientific services are aimed as much as possible at addressing the needs of the research community, by providing access to equipment and technology that are not readily available and to which scientists working in Italy in particular have limited access. Development and use of and access to infrastructures and instruments therefore form an essential part of HT's strategic vision.

In developing a user access strategy, HT's priority will be to ensure transparent, time-effective use of infrastructures by both internal and external researchers.

In order to extend and further facilitate researcher access and position HT's Facilities internationally, where possible, these will take part in European schemes and programmes and other special programmes (e.g. iNEXT, Instruct, Euro-BioImaging, etc.). In setting up its Facilities, HT has invested and continues to invest in innovative technology with a view to offering state-of-the-art equipment and expertise. An important aspect is the need to recruit highly-qualified professionals (e.g. senior technical staff) who understand the technology on offer and can support researchers in their experiments, as well as promote the dissemination of crucial resources, methods and expertise in specific areas of technology relevant to HT's science.

HT Facilities also play an active role in training designed for both 'biological users' and more specialised technical staff from other national and international institutes.
Prime Facilities, already operational or in an advanced stage of completion, are the Data Centre, Genomics Facility, Cryo-Electron Microscopy Facility, Light Imaging Facility, Image Analysis Facility and Automated Stem Cell Facility (for full details of these facilities please see the subchapter 1.2 "Research Centres and Facilities" of this document).
In addition to these, additional technological platforms are planned, including: Fluorescence Activated Cell Sorting (FACS) service, Protein Expression and Purification, Crystallisation and Biophysics, Proteomics, Metabolomics, Animal Research Facility and Transgenic Facility.

A further step forward, completed in conformity with this strategic objective, is marked by the recent signing of the Agreement, introduced by article 1, paragraph 275, of Law No. 160 dated 27th December 2019, between HT and the Founding Italian Ministries. The Agreement is designed to promote HT's specific function of science and technology park to support national scientific research. The Agreement's field of application is to identify, construct and run new infrastructure Facilities known as National Platforms, i.e. facilities, resources and connected services used by the scientific community to conduct high-quality research in its respective fields.



TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING

This strategic objective comprises the following steps:

- **Attract internationally-renowned researchers**
- **Share knowledge and encourage knowledge and experience exchange and sharing**
- **Train the next generation of researchers**
- **Promote mobility and exchange of outstanding researchers between research institutes and organisations**

Through its synergetic missions, HT helps to improve the national life sciences research system. At the same time, the Foundation wants to take on the role of reference partner of other leading international institutes in the field.

Through participation and promotion of scientific networks with prestigious (international) partners, HT aims to give greater visibility to Italian biomedical research, thus helping to raise its profile. Another very important goal for HT is to offer young scientists advanced scientific training programmes.

Through the International Desk of the Human Resources Department of the Foundation's Administration, numerous programmes have been designed to support the mobility and reception of talent from all over the world.

Since 2018, the Foundation has been part of the joint PhD programme in Data Analytics and Decision Sciences (DADS) with the Milan-Polytechnic, a partnership that involves three departments – Electronics, Computer Science and Bioengineering (DEIB), Management, Economics and Industrial Engineering (DIG) and Mathematics (DMAT) – and the Analysis, Decisions and Society Centre (now Health Data Science). The part of this three-year programme that involves Health Data Science is designed to train highly-qualified data analysts and data managers who will be able to conduct important research for healthcare and the health system at universities, clinical research centres, hospitals, health authorities, international institutes, financial institutions, technology companies, regulatory authorities and other public bodies.

In 2019, HT joined the European School of Molecular Medicine (SEMM) four-year PhD programme in Systems Medicine as a host institute. Set up as a partnership between various Italian life science research institutes, Milan University and the University of Naples Federico II, SEMM is a private training foundation that combines basic, translational and clinical research in biomedicine's emerging sectors. In this context, the SEMM PhD in Systems Medicine offers courses in Molecular Oncology, Human Genetics, Computational Biology and Medical Humanities, as well as complete training courses, mainly held by the faculty of SEMM host institutes, in areas of particular relevance to these different sectors of biomedicine.

In 2021, HT was admitted as a host institute to the national PhD programme in artificial intelligence, coordinated by the National Research Council (CNR) and comprising five PhD courses involving 61 universities and research institutes. HT has also joined as a host institute the AI & Health and Life Sciences PhD Course that is led by the Campus Bio Medico University in Rome. HT's participation is considered of great strategic value as regards both attracting outstanding young computational scientists and offering expertise that can help to shape activities in the AI field at national level.

In 2021 HT signed a memorandum of understanding with the International School for Advanced Studies (SISSA), University of Naples "Federico II" and Turin University. Besides laying the foundations for scientific partnerships, the agreement with these academic institutes offers the possibility of organising joint training schemes.

Additional opportunities for joint PhD training schemes with Italian universities and research institutes are being considered.
Finally, HT provides specific training schemes with a dual purpose: to enhance knowledge and skills in certain areas of research and assist career growth and development in various life science sectors of interest to the scientist. Training activities are aimed at all categories of scientist: interns, PhD students, postdoctoral researchers, young group leaders and core-facility experts/managers.

For example, training programmes for young group leaders include laboratory leadership courses, mentoring schemes and professional development activities enabling them to acquire the skills needed to manage a laboratory and establish themselves as leaders in their field.

The entire international scientific community has access to seminars held by HT group leaders, as well as to seminars, courses and conferences with top level international speakers held on the premises or in other research institutes. HT scientific staff are also actively involved in external training so as to increase their experience of scientific dissemination.

These are just a few examples of HT's commitment to training in an extensive range of areas relevant to life science and biomedical research.

Training is aimed not only at HT's in-house scientists, but also researchers employed in biomedical research centres in Italy or abroad, with the aim of making HT a centre of excellence for training talented young researchers by granting access to HT's methods, resources and experience.

The Foundation also organises and contributes to the organisation of conferences, symposiums, workshops, theoretical and practical courses. These activities are at the cutting edge of the scientific and technological research areas in which HT operates and essential to modern biomedical research.

The first training activities, covering the field of image analysis, involved around 50 scientists belonging to top institutes from all over the world and began during 2021, receiving extremely positive feedback from the participants. Subject to the availability of laboratories and equipment, there will be a gradual increase in these activities over the coming months, including in other pertinent areas such as computer programming, computational omic data analysis in the field of neurogenomics, theoretical and practical sessions in areas of wet-lab research (e.g. organoid courses and advanced courses on genome editing or the use of Cryo-Electron Microscopy methods).

The Foundation is in the process of developing a Scientific Visitor Programme to promote the mobility and dissemination of methods developed in-house, enabling external scientists to spend time at HT for research collaboration, learn methods in use at HT and use the existing Facilities.

The Early Career Fellowship Programme represents a further project closely linked to this strategic objective. In 2020, HT first banned this programme that is designed to support the professional development of talented researchers, helping them to set up their own independent research activity in Italy. Thanks to the ECF programme, during 2021, 5 young researchers returned from abroad with a grant worth 200,000 euro per annum for 5 years, enabling them to set up their own research laboratory in institutes all over the country. In October 2021, selection began for the 2021 ECF and the names of the new winners will be released by the end of 2022.

SCIENTIFIC REPUTATION AND DISSEMINATION

This strategic objective comprises the following steps:

- **Be a part of the most important international dissemination networks (conferences, associations, etc.) and scientific organisations**
- **Obtain research grants and awards**
- **Organise/host scientific events for an audience of experts and lay people**
- **Promote scientific literacy and its dissemination amongst a wider public**

It is essential that HT belong to the most important international networks and play an active role in scientific collaboration projects.

The Foundation is involved in talks and discussions with the scientific community on a regular basis. Various framework partnership agreements have already been signed, both to set up joint research projects or training programmes and promote interaction between industry and academia.

The aim of these projects is to boost national research and innovation skills in the sectors of life science, agrifood and nutrition, as well as improve reputation and promote scientific dissemination.

The completion of the appointment of HT's scientific leadership in 2021 has led to a surge of projects and meetings with various players from the biomedical scientific community who are eager to work with the Foundation on the basis of complementary expertise and common research objectives.

It is therefore important for HT to establish ties with European and international institutes, participating in large-scale research projects, international collaborative consortia, conferences and scientific associations. Taking part in all these projects is strategic for HT and cross-cutting, involving scientists from various Centres and Facilities who collaborate across various disciplines and areas of research.

HT's willingness to engage with the outside is also expressed by activities involving non-scientific stakeholders and the general public. HT has an ongoing commitment, in a range of awareness-raising, training and dissemination activities and an active role in popularising science effectively, promoting a public understanding of the importance of scientific research and knowledge-based innovation, as well as encouraging continuous, fruitful dialogue between science and society.

This dialogue does not just concern the academic level, but also takes the form of more informative initiatives.

In 2021, HT launched, for example, the 'HT Presents' programme, a series of online meetings to explore and discuss science, innovation and society, with the message that science is everyone's heritage. The 'HT Presents' events were held throughout the year, taking as their starting point the publication of a non-scientific essay, to be read through the lens of science, to fuel a debate between the author, Human Technopole and representatives of academia, science and industry.

There have also been numerous HT participations in various initiatives both to promote the role of women in research and to promote the presence of women in science faculties, as well as HT's participation in schools of all levels in the area to disseminate basic science topics.

In conclusion, HT's aim is to play an active role in imparting science effectively and ensuring that its work, just like that of more general science, is heard about and understood by not just scientists, but also the ordinary public.

RESEARCH-BASED INNOVATION

The aims of this strategic objective are as follows:

- **Sign agreements with external organisations and industry to generate economic and social value from research findings**
- **Develop, file, register and protect patents**
- **Set up new companies and promote technology transfer**
- **Provide innovative training and mentoring services for Italian (and international) academia**

The life science sector, including medical technology, biotechnology and pharmaceuticals, is highly productive and represents an area of great interest for innovation.

Contributing to economic and social progress by transferring research findings to applications, therapies and products is one of HT's main objectives and an additional way for the Foundation to fulfil its mission.

As HT research activities grow, technology transfer activities will be arranged in a structured manner so as to help transform discoveries and inventions into tangible applications and marketable products.

New scientific technology and methods resulting from HT's work cover the entire range of life sciences in the broadest sense, including therapeutic and diagnostic strategies, enabling technology, molecular tools and assays, instruments and devices, as well as software applications and databases, to be developed in close cooperation with industrial partners from the pharmaceutical, biotech, engineering and IT sectors.

In addition to launching technology transfer activities and in line with the Foundation's commitment to the wider academic community, HT is investigating how it can help to improve transfer technology opportunities for Italian researchers.

Besides research experience, successful technology transfer requires a wide range of business skills and expertise as regards intellectual property, as well as the ability to identify and attract the interest of business partners with whom to negotiate in order to develop optimised strategies for bringing individual products and technology to the market.

With this in mind and also as a result of the provisions of article 49 a) of Decree Law No. 34 dated 19th May 2020, enacted with amendments as Law No. 77 dated 17th July 2020, in July 2021, HT opened a new facility known as the "Centre for Innovation and Technology Transfer in the life science field". The Centre's function is to promote innovative processes submitted by the public or private entities within the research and innovation system with particular focus on:

- supporting patenting and maximising the value of intellectual property;
- promoting collaboration between private entities from the innovation system and national and European research institutes;
- assisting the dissemination of research findings and knowledge transfer;
- encouraging research based collaboration between businesses and start-ups to develop biotechnology, artificial intelligence technology for genetic, proteomic and metabolic analysis, as well as technology relating to diagnostics, active surveillance, protecting frail people and improving the quality of life.

Another role that the Centre plans to carry out regards the organisation of specific training courses to promote an entrepreneurial mindset amongst academics and contribute to bridging the general shortage of technology transfer professionals in the life sciences sector.

In addition to training courses, HT is involved in organising schemes to make full use of research findings. The HT CITT has initiated numerous discussions with key players from universities and other public and private organisations operating in the sector with a view to exploring the national technology transfer scene and identify additional ways of benefiting the wider academic community.

At the same time HT has undertaken to activate interactions with potential business partners in a variety of sectors, including biotech, pharmaceuticals, instruments and IT, engaging in dialogue with businesses in the genomics, data analytics, biomedical imaging and many other sectors.
Various partnership models have been discussed with each of these businesses depending on the complementarity with HT's scientific activity and the opportunities for specific collaborative schemes. The schemes range from the implementation of joint postdoctoral projects or programmes to joint training programmes (e.g. organising courses and workshops) to R&D partnerships for joint development of new tools (e.g. algorithms and software) and applications, such activities being sponsored or co-sponsored by the businesses in question.

We are also examining the possibility of creating more formal long-term partnerships with selected businesses. These will be implemented by combining the supply of instruments and services with codevelopment and access to new technology, e.g. by making it available for testing by HT researchers and users at the Foundation's core facilities.

SUSTAINABILITY (ENVIRONMENTAL, SOCIAL AND ECONOMIC)

The aims of this strategic objective are as follows:

- **ENVIRONMENTAL SUSTAINABILITY**
  Contribute to minimise the environmental impact of the MIND site and optimise the environmental efficiency of buildings and laboratories, minimise experiments on animals

- **SOCIAL SUSTAINABILITY**
  Have a positive impact on the territory (employment, economic induced activities, etc.), promote awareness of the importance of science and research in society and the public, becoming a reference for a new generation of students

- **ECONOMIC SUSTAINABILITY**
  Attract investors, including private investors, be efficient in the use of resources, ensure economic-financial balance from a long-term perspective through self-financing

As regards economic sustainability, HT is hoping to attract additional investments, in particular by continuing to attract grants of international scientific relevance.

HT also adopts a policy of maximum efficiency in the use of resources, guaranteeing the balance between profitability and financial sustainability, also in a long-term view. In the coming years, we expect that HT's main sources of external research funding can also be obtained from international organisations.

These will include the European Commission, through its Framework Programmes, and other funding schemes such as the European Research Council or other individual awards, National Institutes of Health (NIH) that finance some activities outside of the United States, private foundations and non-profit organisations. By consolidating activities to maximise the value of research findings, it is expected that additional contributions to HT's overall budget will come from patent licensing and revenues generated by intellectual property (e.g. royalties), as well as joint programmes with industry.

Generally speaking, sustainability is an integral and essential part of HT activities and reaching this objective corresponds with simultaneous achievement of the 17 UN 2030 Agenda Sustainable Development Goals (SDGs).

HT has specified a set of goals supplementing the results of the activities performed with awareness of the social and environmental effects associated with them. With the introduction of integrated reporting, HT implemented a process aimed at assessing and investigating the contribution that the Foundation can make towards achieving the sustainable development goals specified by government leaders of the UN's 193 Member States. For more details of sustainability goals, especially those regarding environmental and social aspects, please see the subchapter 2.4 "Responsible and sustainable approach".

PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT

The main aims of this strategic objective are:

- **Establish long-term partnerships with the main stakeholders**
- **Contribute to the development and proficuous use of the MIND site, promoting joint projects and synergies with its partners**
- **Promote stakeholder engagement**

As previously stated, an important goal for HT is to consolidate the relationship with its stakeholders, by means of scientific collaboration, facility sharing or agreeing to organise and host scientific training activities and events aimed at in-house scientists and external scientists from universities and other research institutes.

As regards the latter, HT is continuing its discussions with the various Italian stakeholders, including universities, scientific institutes and individual hospitals and research institutes, in order to identify areas of particular need. Taken as a whole, HT's external training activities aim to create a global forum for sharing, discussing and learning about cutting-edge biomedical science and technology.

As regards interaction with the world of industry, it is considered that public/private partnerships may represent the ideal way of leveraging HT's skills and expertise with a view to stimulating industrial and technological development. Being located within the MIND campus should help to promote such interaction as many highly-innovative businesses will move to the area in question.

As the MIND campus develops, it should also become easier to set up an area in which research findings can take the first steps towards commercialisation, both by creating start-ups and through joint development with industrial partners.
In order to achieve these objectives, the HT communications strategy is aimed at building, consolidating and maintaining the Foundation's visibility and reputation, promoting events and projects that establish a positive relationship between the institute and its main stakeholders.

Overall, communications activities support HT's strategic development by increasing its visibility and creating reasonable expectations for the stakeholders.

The activities that HT conducts in this field have a number of different tools available that are used selectively according to the specific target audience from amongst the various stakeholder groups.

These tools include the national press, radio, television and digital media, including some scientific media, social media or the organisation of and attendance at seminars, conferences or events, along with other methods of raising awareness, including amongst the general public, of HT's mission and work.

Furthermore, HT's primary mission is to assist with the promotion of health and well-being and indeed, the main stakeholders are the ordinary public who can obtain long-term benefits from the Foundation's activities.

The areas available in HT are and will be utilised to host public events, seminars and conferences in order to extend HT's sphere of influence, involving visitors and the local community.

Where possible, the development of training and dissemination activities (i.e. aimed at non-scientists) need to be organised with the assistance of academic and scientific partners.

HT's engagement with the younger generations through schools and scientific education programmes is particularly important in order to raise awareness of the importance of science and promote careers in life science or biomedical research.

In all areas described above, from scientific to clinical and industrial relations, right up to interaction with the general public, HT will continue to work with other national and international organisations.

EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES

The specific aims of this strategic objective are as follows:

- **Develop technological and digital processes (e.g. Digital Transformation)**
- **Create an attractive environment for non-scientific talents/professionals**

DIGITAL TRANSFORMATION

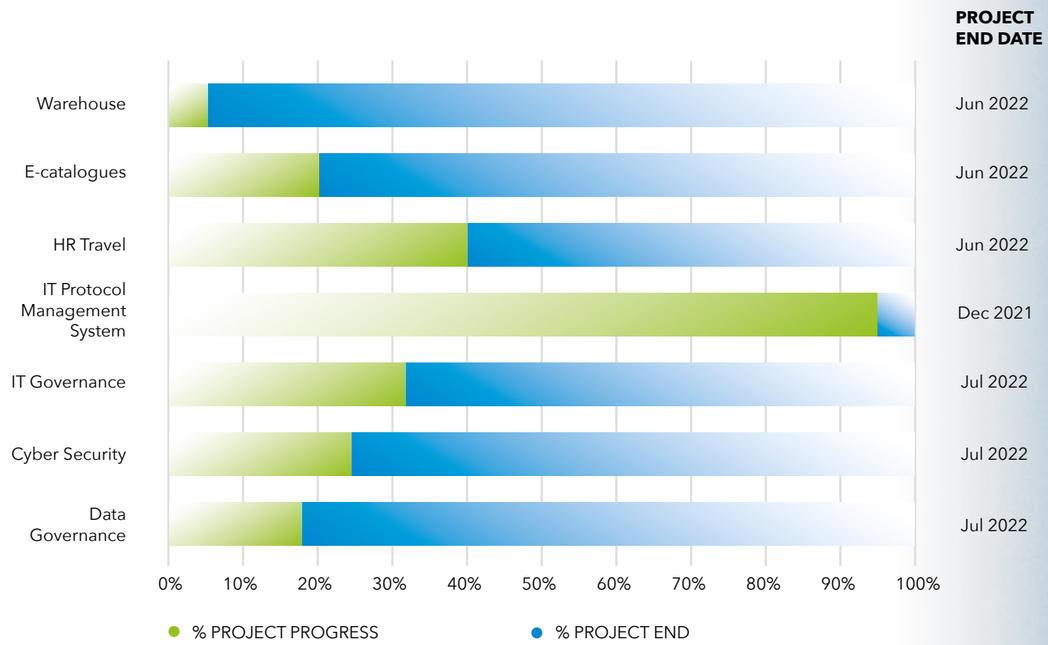
As regards digital transformation, HT is implementing a complex process aimed at acquiring new tools and skills into a public sector digitalisation framework designed to ensure the efficiency of operational processes and improved transparency and integrity of the Foundation's operating and financial data.

During 2021 steps were taken to implement the ERP system provided in order to handle the operational processes of the procurement and administration cycle.

The project has also been extended to other areas such as human resources, project management, e-procurement and warehouse management. There will also be important focus on developing a business intelligence platform that can interface with the current ERP in order to provide additional added value to administration processes.

The following table shows the status as at 31/12/2021 of the main digitalisation projects mentioned above:

% DIGITAL TRANSFORMATION PROJECT PROGRESSION



PROJECT MANAGEMENT

Whilst developing the Digital Transformation projects, in 2021, the Foundation introduced a Project Management scheme to enable effective planning, organisation, monitoring and control of the administrative aspect of all projects.

The aim of this activity is to ensure that the various projects are completed by deadline and within budget.

Project Management also provides an overall picture of all Foundation projects, taking advantage of the synergies existing between them and ensuring they are in line with corporate strategy.

Using a continuous resource planning and control process, the PMO (Project Management Office) aims to increase overall project efficacy and obtain greater efficiency as regards:

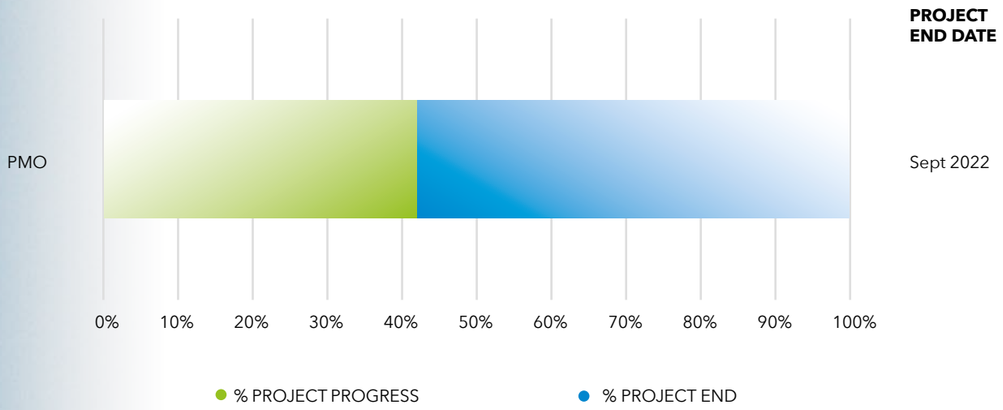
- Resource optimisation
- Risk containment
- Cost containment

The PMO is currently being set up and its work is supported by a specific project whose aims are the creation of a project management culture and implementation of a set of tools to monitor and coordinate all HT activities in a uniform manner.

In order to achieve this objective, the project will analyse HT's current activities and abilities in order to identify and apply a Project Programme Portfolio Management approach/method.

The project status as 31st December 2021 is outlined in the table below:

% PMO PROJECT PROGRESSION



MANAGEMENT CONTROL SYSTEM

The aim for operational process efficiency and efficacy also requires efficient cost monitoring of the project and other general activities in order to enable precise and comprehensive reporting of the resources utilised. To this end, as from 2021, the Foundation has begun the process of implementing a management control system.

The new HT control system has been developed on the basis of cost reporting requirements for the activities performed that must comply with the disclosure obligations towards the Foundation's financial backers or sponsors.

As stated in the "Financial Capital" section, a distinction should be made between:

- **Founding Ministries (Economy and Finance, University and Research and Health)**, that provide an annual grant in accordance with Law No. 232/2016 designed to support the creation of a scientific and research infrastructure (**Agreement**);
- **Economy and Finance Ministry (MEF),** that provides an annual grant pursuant to article 49 a) of Decree Law No. 34 dated 19th May 2020 (Recovery Decree), enacted as article 1, paragraph 1, of Law No. 77 dated 17th July 2020 (**CITT** – Centre for Innovation and Technology Transfer in the field of life sciences);
- **Other parties**, that finance individual scientific research projects after taking part in specific calls for proposals (e.g. **EU grants**).

Technically speaking, the management control system refers to a set of activities and tools used to verify whether corporate performance is in line with the objectives set by the Strategic Plan and Annual Budget and complies with cost effectiveness principles.

This system forms a part of the 'Foundation system', regulating operating processes and tools used to achieve corporate targets in accordance with the organisational structure.

The HT control system is part of a general framework that provides for:

- **Value Creation System**
  Represents the set of strategic choices aimed at assisting sustainable long-term growth in order to create value across the board for all of the Foundation's stakeholders.

- **Organisation and Processes**
  This is the set of interrelations created between production cycle processes (e.g. supply planning, sourcing & procurement, logistics) and economic-financial processes (e.g. finance) responsible for the efficiency of operational processes.

- **IT System**
  This is the set of people, equipment, applications and procedures that allow an organisation to obtain the information needed to make suitable decisions.

The following diagram shows how the HT management control system integrates with the value creation system:

INPUT

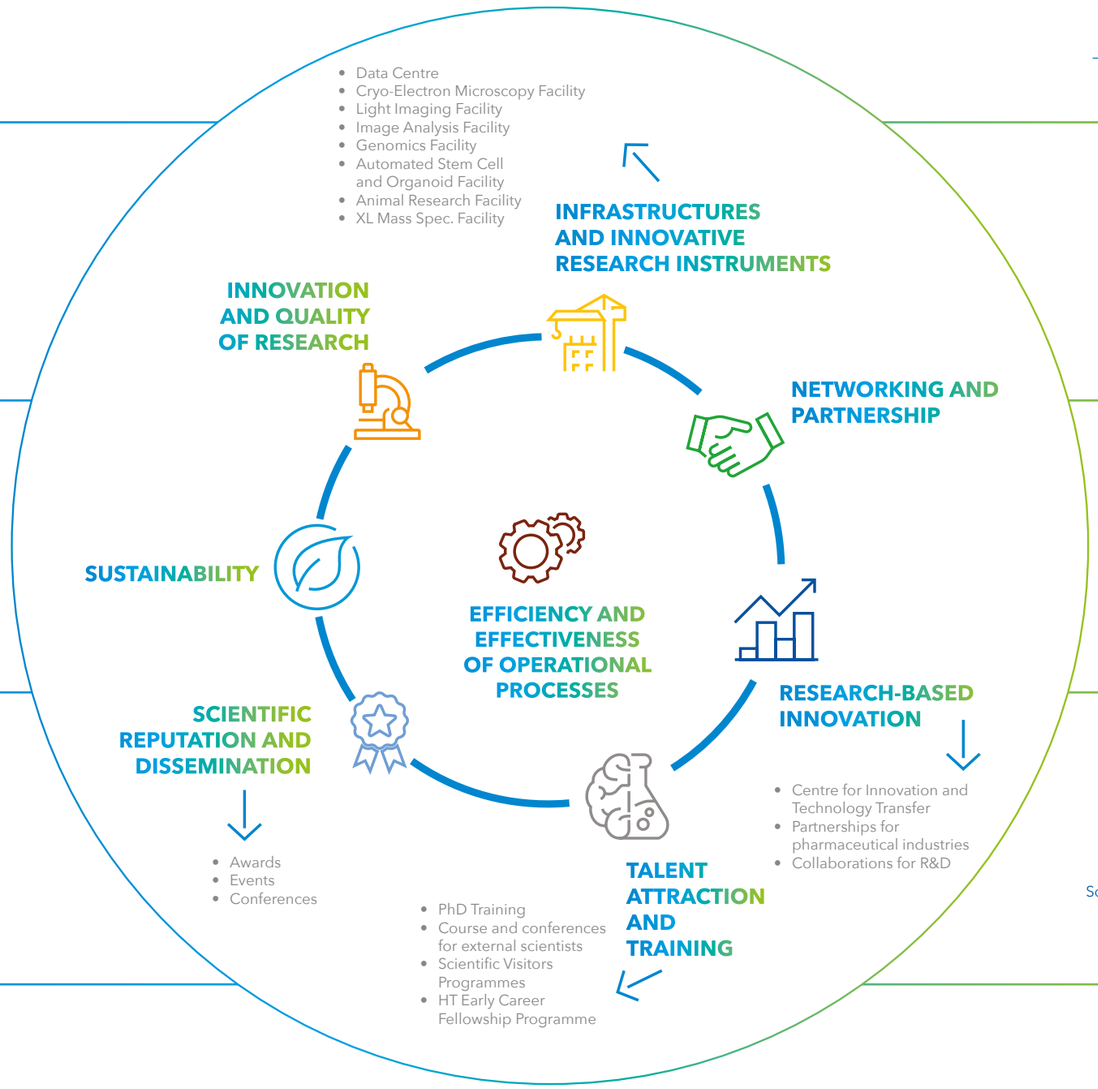
Financial Capital
«MEF» grants (Agreement, CITT)
External grants (e.g. EU)

Human Capital

Infrastructural Capital

Relational Capital

Intellectual Capital



OUTPUT

Transformation of scientific discoveries into tangible applications for the benefit of patiens

Attraction of additional funding, including from private sources

Career opportunities for the next generation of scientists

Operating scientific services and facilities to be made available to external scientists

Scientific collaboration, institutional events and initiatives of great relevance

Innovative approaches for personalized and preventive medicine

Awareness importance of science and scientific literacy

1° LEVEL BU	2° LEVEL Funding type	3° LEVEL Grants details	4° LEVEL Projects
RESEARCH CENTRES	MEF – Agreement	MEF HT	Project
Genomic Centre: - Medical & Pop. - Functional		MEF NP	Project
Neurogenomic Centre			Project
Structural Biology Centre		MEF Outside scope of application	Project
Computational Biology Centre			Project
Health Data Science Centre	MEF pre-2021 grants		
CORE FACILITIES	MEF CITT		...
Data Centre			...
Cryo-Electron Microscopy Facility	MAECI		
Light Imaging Facility	EU grants	ERC cilia-Pigino	Project
		ERC Tyroid-Coscia	Project
Image Analysis Facility	Other scientific research grants	Google-Jug	Project
Genomics Facility		SVCF-Jug	Project
		SANGER-Iorio	Project
Automated Stem Cell and Organoid Facility		Glasnstonbury-Soranzo	Project
.....		EMBO 1 Pigino	...
		EMBO 2 Pigino	...

Institutional
Commercial

The control system therefore supports value creation in the field of the scientific research activities in which the Foundation operates, pursuing the strategic objectives.

As already described in the section concerning the value creation system, **INPUTS** differ according to the type of capital that can be:

- **Financial** - financial resources obtained from MEF Grants (Agreement, pre-2021 and CITT Grants) and external Grants, both institutional (MAECI) and scientific (e.g. EU);
- **Human** - skills, experience and excellence of both scientific and non-scientific staff;
- **Infrastructural** - assets belonging to HT, facilities, infrastructures and services;
- **Relational** - relations with the group of stakeholders and joint ventures with research centres and universities;
- **Intellectual** - the wealth of knowledge and organisation of the Foundation's scientific research.

OUTPUTS are designed to achieve strategic objectives and can be split into several types:

- Novel approaches to personalised and preventive medicine;
- Operational scientific services and facilities to be placed at the disposal of outside scientists;
- Conversion of scientific discoveries to tangible applications for the benefit of patients and society;
- Career development and opportunities for the next generation of scientists;
- Awareness of the importance of science and scientific literacy;
- Attracting additional funding, including from private sources;
- Important scientific collaboration, institutional events and projects.

As part of the control system, these outputs are therefore split into **four** distinct **levels**:

- **Business Unit (BU)** (**level 1**), i.e. Research Centres and associated Facilities;
- **Funding type** (**level 2**) including: MEF Grants (Agreement and remainder of pre-2021 grants), CITT Grants, MAECI, EU Grants and Other grants;
- **Details of MEF Agreement Grant** (**level 3**), including: HT share (in turn split into Institutional and Commercial Activity), NP share, outside scope of application;
- **Research projects** (**level 4**) with details of individual scientific research and institutional projects.

TRAINING OPPORTUNITIES

Finally, as regards the aim of creating an attractive work environment for non-scientific talents and professionals, HT will be offering its staff a series of training opportunities by organising courses covering soft skills and technical subjects of more general interest. The aim is to improve the professional profiles and promote the continuous personal and professional development of its employees.

The choice of training includes a vast range of courses and workshops designed to develop, for example, personal, communication, project management and computing skills.

This area also includes management and leadership development courses, especially for staff in managerial positions.

Finally, in accordance with HT's international nature, language courses will be available, including beginners' courses to aid the integration of international employees into the Italian environment, as well as advanced language training for specific work purposes within HT.

Generally speaking, the courses organised will, to the extent possible, be flexible and tailored to suit the individual requirements and requests of HT staff. A detailed, organised schedule for these activities is yet to be planned, but a few small-scale courses were launched in 2020 with this number increasing during 2021.

Furthermore, significant expansion is expected during the term of the current strategic plan.

2.4 Responsible and sustainable approach

In 2015, United Nations Member States adopted the 2030 Agenda for sustainable development that provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), *"which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth - all while tackling climate change and working to preserve our oceans and forests"* (United Nations website).

The 17 Sustainable Development Goals are pictured here below:

HT has identified 10 SDGs that are in line with its strategic objectives and of direct importance to the Foundation's approach within its areas of operation. The SDGs are interconnected and therefore HT can offer a contribution towards more than one SDG, including those not listed in this section of the document.

The following table summarises the connections between the 10 SDGs and HT strategic objectives:

INNOVATION AND QUALITY OF RESEARCH	3) Good health and well being
DEVELOPMENT AND PROVISION OF INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS	11) Sustainable cities and communities
	3) Good health and well being
ATTRACTION, TRAINING OF RESEARCH TALENT, SHARING OF RESEARCH OUTPUTS	4) Quality education
	8) Decent work and economic growth
SCIENTIFIC REPUTATION AND DISSEMINATION	4) Quality education
RESEARCH-BASED INNOVATION	9) Industry, innovation and infrastructure
	8) Decent work and economic growth
SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	3) Good health and well being
	4) Quality education
	5) Gender equality
	6) Clean water and sanitation
	7) Affordable and clean energy
	8) Decent work and economic growth
	12) Responsible production and consumption
	16) Peace, justice and strong institutions
PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT	8) Decent work and economic growth
	16) Peace, justice and strong institutions
EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES	8) Decent work and economic growth

A short description is given hereafter for each SDG, along with the contribution provided by HT activities and programmes and the relationship between SDGs and the Foundation's strategic objectives.

3. GOOD HEALTH AND WELL-BEING
To ensure healthy lives and promote well-being for all at all ages

HT can contribute towards the progress of this SDG through scientific research programmes and the use of state-of-the-art facilities to support research. This SDG is closely connected with the goals '**Innovation and quality of research**' and '**Development and provision of infrastructures and innovative research instruments**'.
This SDG is also linked to the strategic objective '**Sustainability (environmental, social and economic)**' and in particular social sustainability and the aim of improving quality of life of citizens (health, age, well-being).

4. QUALITY EDUCATION
Provide inclusive and equitable quality education and learning opportunities for all

HT contributes towards the progress of this SDG through training programmes and activities for the next generation of researchers, schemes to promote mobility and exchange of outstanding researchers and to disseminate scientific knowledge amongst experts and lay people. This SDG is closely connected to the HT strategic objectives: '**Talent attraction and training, and research output sharing**' and '**Scientific reputation and dissemination**'. There is also a link with the strategic objective '**Sustainability (environmental, social and economic)**' and in particular with social sustainability and the aims of promoting awareness of the importance of science and research among society and the public and becoming a benchmark for a new generation of students.

5. GENDER EQUALITY
Achieve gender equality and empower all women and girls

HT contributes towards the progress of this SDG through diversity management activities and programmes designed to promote equal opportunities amongst women and men.

A tangible example of this is the implementation, early in 2022, of the Gender Equality Plan (Our Gender Equality Plan - Human Technopole) details of which you can find herein in the section on 'Human Capital'. This SDG is closely connected with the strategic objective '**Sustainability (environmental, social and economic)**' and in particular social sustainability and the aim to promote equal opportunities between women and men.

6. CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all

HT can contribute towards the progress of this SDG through activities and programmes to implement a QHSE policy that represents the Foundation's commitment to reduce the environmental impact and optimise the use of energy resources. More specifically, in April 2021, the position of Environment, Health & Safety Expert was added to the HSE team, leading to the implementation of an environmental operations management process.

In January 2022, the Environment Health & Safety Expert and Integrated Management System Expert began an initial analysis of environmental risks (Initial Environmental Assessment), specifying methods and criteria to identify and assess the importance of the environmental aspects (e.g. generation of waste, atmospheric emissions, noise impact, releases to water, etc.), of the Foundation's activities.
In accordance with the requirements of an environmental management system (standard ISO 14001:2015), upon completion of the process, a report will be produced containing the measures to mitigate environmental compliance and operating risks and environmental improvement objectives with the respective KPIs.
The tool that HT will utilise in order to pursue its environmental, social and economic sustainability policy and objectives is an Integrated Management System complying with standards: UNI EN ISO 9001:2015, UNI EN ISO 14001:2015, UNI ISO 45001:2018.

An Initial Environmental Assessment is also underway relating to the environmental impact of the atmospheric emissions released during laboratory work (e.g. fume cupboards, biosafety cabinets, etc.) and summer and winter air conditioning systems, as well as equipment containing f-gases (fluorinated greenhouse gases).

Currently, atmospheric emission impacts only regard the transport of waste:

- KPI = tons CO_2/tons transported waste;
- CO_2 consumed = litres consumed × emission factor;
- Emission factors kg CO_2/litres diesel.

With reference to the year 2021, the KPI of tons CO_2/ton transported waste records a value of 0.04. These are the HSE's main environmental objectives for 2022:

- Implement environmental management and operational procedures (operational controls, environmental emergency management, environmental audits, external supplier management) in order to monitor environmental management efficacy and efficiency and any internal and external non-conformities:

KPI 1 = No. environmental NCs/No. internal audits;

- Supplier environmental assessment:
  HSE + Procurement & Supply Chain:

KPI 2 = No. supplier HSE NCs/No. contracts.

This SDG is connected with the strategic objective '**Sustainability (environmental, social and economic)**', particularly Environmental Sustainability and the aim to help minimise the MIND site's environmental impact by optimising the environmental efficiency of buildings and laboratories.

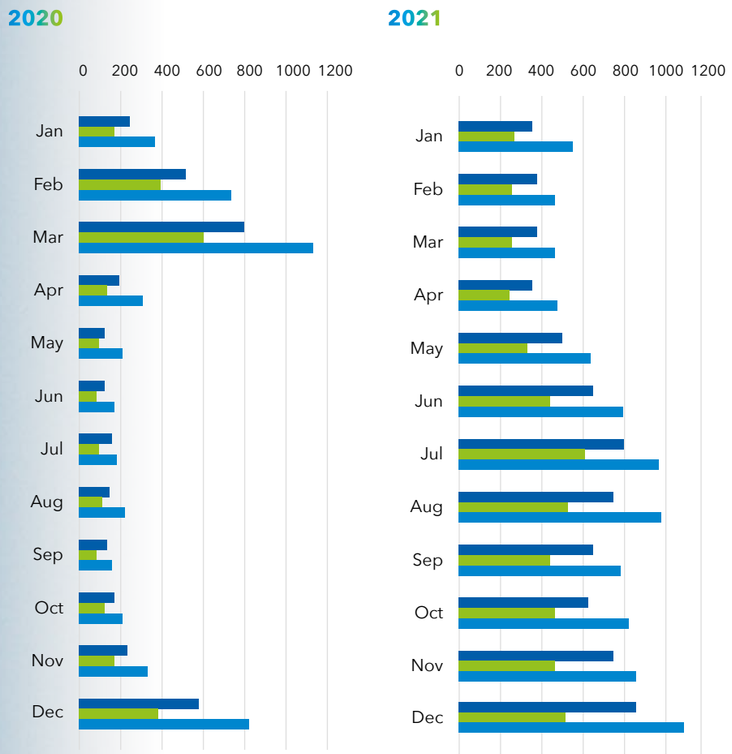
7. AFFORDABLE AND CLEAN ENERGY
Ensure access to affordable, reliable, sustainable and modern energy for all

HT can contribute towards the progress of this SDG through schemes and programmes to implement solar power plants in Campus buildings and the purchase of clean energy from external suppliers. An example of this is the implementation of the 'green option', following signing of an agreement with Consip that allows HT to use electricity produced by renewable sources.

This SDG is connected with the strategic objective '**Sustainability (environmental, social and economic)**', particularly Environmental Sustainability and the aim to optimise the environmental efficiency of buildings and laboratories.

The following tables show electricity consumption for the years 2020 and 2021, as well as estimates for the energy likely to be produced by the solar power plants installed on HT Campus buildings that will come into service shortly.

ELECTRICITY CONSUMPTION 2020-2021 (GJ)



ENERGY FROM SOLAR POWER PLANTS

Building	GJ per year estimated for 2022
Palazzo Italia	305
North Pavilion	52
South Pavilion	124
Incubator Labs	179
TOTAL	**659**

In 2021, the "green option" was activated through a Consip agreement, allowing Human Technopole to use electricity produced by renewable sources.

8. DECENT WORK AND ECONOMIC GROWTH
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

HT can contribute towards the progress of this SDG as a result of its relations with stakeholders and partners in the fields of scientific research and technology transfer and the maximisation of its findings. Upon completion of the development stage, HT will have a positive effect on surrounding areas in terms of employment. Thanks to the research activities, technology transfer and also training programmes, HT will promote the creation of new job opportunities for talented young people, more senior researchers and also employees belonging to the staff. The Foundation continues to maintain its commitment, including through the creation of safe workplaces following implementation of a Health, Safety and the Environment policy. The HSE policy will constitute a statement of commitment and intent by the Foundation's Governance bodies, as well as the framework within which HT processes are carried out and corporate Health, Safety and the Environment (HSE) objectives, roles and responsibilities specified. More specifically, the Policy will form HT's commitment to:

- hazard prevention and removal and health and safety risk reduction for its employees, researchers, collaborators, partners and the community in which HT operates;
- environmental protection, environmental impact reduction, optimised use of energy resources and use of best available technology;
- ensure compliance with the requirements of Occupational Health and Safety legislation (Legislative Decree No. 81/2008 - Consolidated Occupational Health and Safety Act);
- ensure compliance with the requirements of Environmental legislation (Legislative Decree No. 152/2006 as amended and supplemented - Consolidated Environment Act);
- ensure maximum satisfaction of all interested parties.

This SDG is connected with various HT strategic objectives, including:

- **'Talent attraction and training, and research output sharing'**
- **'Research-based innovation'**
- **'Sustainability (environmental, social and economic)'** and in particular with social sustainability and the aim of having a positive impact on the community
- **'Partnership, networking and stakeholder engagement'**
- **'Effectiveness and efficiency of operational processes'**.

9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

HT can contribute towards the progress of this SDG through the activities and programmes relating to the running of the Centre for Innovation and Technology Transfer. In order to comply with legislative requirements, as well as arrange for sufficient involvement in the project of the entities specifically mentioned under article 1 of the so-called Recovery Decree (i.e. treatment and research hospitals, universities, National Research Council, research centres, innovative SMEs and start-ups), as from the end of 2020, HT has started a series of discussions concerning technology transfer with more than 70 representatives from these bodies and many other stakeholders from the sector.

HT is also backing a study of national and international best practices that could serve as a blueprint for the Centre. This SDG is connected with the strategic objective '**Research-based innovation**'.

11. SUSTAINABLE CITIES AND COMMUNITIES
Make cities and human settlements inclusive, safe, resilient and sustainable

HT can contribute towards the progress of this SDG through activities and programmes to develop buildings and infrastructures within the MIND Area that are based on the following criteria:

- **Flexibility**: i.e. the possibility to adapt, modify and reshape the areas over time in order to meet changing requirements and support new lines of research and technology. Apart from anything else, this aspect is essential to modern life science research and therefore also to HT.

- **Durability and maintenance**: design and technical solutions are applied to ensure maximum longevity, limit the need for routine and extraordinary maintenance and optimise and reduce operating and maintenance costs.

- **Innovative construction technology**: where possible, industrialised construction solutions and the use of state-of-the-art materials are preferred, in line with the principles of construction modularity and efficiency (e.g. prefabrication and rapid assembly).

- **Environmental sustainability and energy efficiency**: the planning of work and installation takes place in accordance with energy saving and environmental sustainability criteria, specifying innovative cutting-edge components, whilst implementing architectural solutions, such as passive design, that enable us to reduce consumption and produce energy.

- **Concept of 'common space'**: MIND's overall development plan specifies buildings with a 'permeable' ground floor (common space) and the absence of lots of closed, individual buildings. The degree of 'openness' of the ground floor of HT's new buildings will be decided by considering the needs of new research centres as regards internal logistical requirements for scientific activities, logistical requirements (pedestrian and vehicle traffic) of staff, external suppliers and visitors and matters regarding the security and protection of HT's research work. This SDG is connected with the strategic objective '**Development and provision of infrastructures and innovative research instruments**'.
A project the size of HT also has the objective of reducing its environmental impact to a minimum. HT's actions contribute towards this objective through a combination of schemes, incentives and policies.

These actions include, systematically, reference to their social and environmental impact, with specific rules, procedures and guidelines based on current standards and regulations, such as minimum environmental criteria (CAM) when tendering and the green building rating system LEED (Leadership in Energy and Environmental Design) or Life Cycle Assessment methods to consider the environmental impact of laboratories and buildings.

12. RESPONSIBLE CONSUMPTION AND PRODUCTION
Ensure sustainable consumption and production patterns

HT can contribute towards the progress of this SDG through activities and programmes that the HSE officer has launched with regards to analysis of environmental aspects (emissions, waste, effluent, water resource management, etc.).
As regards the issue of waste management, during 2021, we arranged to:

- identify areas of the Campus to be used for temporary waste storage;
- introduce ERP software to manage hazardous and non-hazardous waste generated by activities at the Research Centres.

The software will deal with documentary requirements for the waste loading/unloading register, tracking records, checks on waste carrier and disposal licences of chosen suppliers, monitoring of the amount of waste produced and its classification. Work at the Research Centres began in June 2021 in the Incubator Labs and North Pavilion. Therefore, as at 31st December 2021, only 2 types of hazardous (*) and non-hazardous waste have been sent for recovery (R) or disposal (D).

CER CODE	WASTE DESCRIPTION	HAZARDOUS WASTE (H) NON-HAZARDOUS WASTE (NH)
CER 180103*	Waste that must be collected and disposed of with special precautions to avoid infection	H
CER 200307	Bulky waste (furniture)	NH

In compliance with GRI 306-2020, details are provided of the waste handled during 2021.
It should be noted that the data entered in the following table has been extrapolated from the SOGER waste management system according to the amount of each individual type of waste and how it is handled (recovery or disposal).
Waste operations are carried out offsite only.

HT waste is sent to what is classed as a temporary storage facility that performs only type R 13 (storage pending treatment) and D 15 (preliminary storage pending collection) operations, i.e. sorting and separating the quantities that can actually be recycled from those to be sent for disposal (incineration with energy recovery, incineration without energy recovery, landfill, other).

These operations carried out on HT waste lead to a conservative estimate of the amounts sent for recovery/disposal as shown in the table and explained in the notes.

TABLE 1. WASTE BY COMPOSITION, IN METRIC TONS (T), FOR THE YEAR 2021 (RIF. GRI 306)

COMPOSITION OF THE WASTE				WASTE GENERATED (GRI 306-3-a)	WASTE DIVERTED FROM DISPOSAL (GRI 306-4-a)	WASTE DIRECTED TO DISPOSAL (GRI 306-5-a)
Description and EER code	**Type of waste**	**Waste streams**	**Present materials**	**Tonn**	**Tonn**	**Tonn**
Mixed furniture such as cupboards, desks and the like (EER 20.03.07)	Non hazardous	Furniture maintenance and renovation	Glass, iron, steel, entire plastic items, polyurethane foam, wood	3.27	1.962 (1)	1.308 (1)
Mixed waste, potentially infected, from microbiological research laboratory (EER 180103*)	Hazardous	Resource activities in the biological laboratory	Paper, glass, plastic packaging, parts of plastic articles, organic substances, solvents, potentially infected biological liquids and solids	0.144	-	0.144
TOTAL WASTE				**3.414**	**1.962**	**1.452**

TABLE 2. WASTE DIVERTED FROM DISPOSAL BY RECOVERY OPERATION, IN METRIC TONS (T) (RIF. GRI 306)

	ONSITE (GRI 306-4-d-i)	OFFSITE (GRI 306-4-d-ii)	TOTAL (GRI 306-4-b e c)
Hazardous waste			
Preparation for reuse	-	-	-
Recycling	-	-	-
Other recovery operations	-	-	-
TOTAL	**-**	**-**	**-**
Non-hazardous waste			
Preparation for reuse	-	-	-
Recycling	-	1.962(1)	1.962(1)
Other recovery operations	-	-	-
TOTAL	**-**	**1.962**	**1.962**
Waste prevented	-	-	-
Waste prevented	**-**	**-**	**-**

Note (1). The value indicated for bulky waste (EER 20.03.07) delivered in R 13, is the result of sorting and separating operations, of which an estimated 60% recyclable material and 40% material for disposal out of the total waste delivered.

TABLE 3. WASTE DIRECTED TO DISPOSAL BY DISPOSAL OPERATION, IN METRIC TONS (T)

	ONSITE (GRI 306-5-d-i)	OFFSITE (GRI 306-5-d-ii)	TOTAL (GRI 306-5-b e c)
Hazardous waste			
Incineration (with energy recovery)	-	0.131 [2]	0.131
Incineration (without energy recovery)	-	0.013 [2]	0.013
Landfilling	-	-	-
Other disposal operations	-	-	-
TOTAL	**-**	**0.144**	**0.144**
Non-hazardous waste			
Incineration (with energy recovery)	-	0.654 [3]	0.654
Incineration (without energy recovery)	-	-	-
Landfilling	-	0.654 [3]	0.654
Other disposal operations	-	-	-
TOTAL	**-**	**1.308**	**1.308**

Note [2]. The values indicated result from the fact that potentially infectious waste (EER 18.01.03*) undergoes different disposal operations depending on the operation indicated on the form: 0.131 tonnes collected in R 13 are destined for incineration with energy recovery; 0.013 tonnes collected in D 15 are destined for incineration without energy recovery.

Note [3]. The values indicated derive from the consideration that the part of bulky waste (EER 20.03.07) 1.308 tonnes that is not recyclable (ref. Note 1), on average is destined for two types of disposal operations: 50% is incinerated with energy recovery; the other 50% is sent to landfill.

This SDG is connected with the strategic objective '**Sustainability (environmental, social and economic)**', particularly environmental sustainability and the aim to help minimise the MIND site's environmental impact and optimise the environmental efficiency of buildings and laboratories.

16. PEACE, JUSTICE AND STRONG INSTITUTIONS
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

HT contributes towards the progress of this SDG through programmes and activities to implement the Organisational Model pursuant to Legislative Decree No. 231/2001, ensuring legality, transparency and propriety in managing its institutional activities. Furthermore, when awarding procurement contracts for works, services and supplies, HT follows the principles of cost effectiveness, efficacy, promptness and propriety. In other words, HT complies with the principles of open competition, non-discrimination, transparency, proportionality and disclosure, as well as the principle of rotation of the parties invited to or awarded the tender where procedure so requires, taking environmental sustainability into account and avoiding conflicts of interest (Legislative Decree No. 50 dated 18th April 2016 as amended).
The Corporate Organisational Model pursuant to Legislative Decree No. 231/2001, approved following a resolution by the *Consiglio di Sorveglianza* on 29th July 2020, also stipulates the requirement to notify the *Organismo di Vigilanza* of any breach or suspected breach of said Organisational Model, including the Code of Ethics, as well as any illicit conduct relating to the perpetration of predicate offences (whistleblowing).

With reference to the Code of Ethics, whose guiding principles are listed herein under subchapter 1.1 "Mission, vision and values" , HT has attempted to specify a system of behavioural values and rules to which constant reference can be made when conducting its business and to which all those acting on behalf of the Foundation should adhere, regardless of the, even temporary, relationship forming the bond between them.

The Code of Ethics is an integral part of the Corporate Organisational Model pursuant to Legislative Decree No. 231/2001 and has been implemented by the Foundation with a view to preventing:

- the commission, in accordance with Italian law, of the offences specified by Legislative Decree No. 231/2001;
- conduct at odds with the values that the Foundation seeks to promote.

The persons covered by the Code of Ethics are: members of Foundation Governance boards, permanent and temporary employees and consultants, each according to the contractual nature of the relationship with the Foundation and the degree of independence that the position affords, third parties having a contractual relationship with the Foundation or who, in any event, cooperate in some way in order to achieve its institutional objectives.

The Foundation agrees to ensure prompt in-house and external dissemination of the Code of Ethics by:

- sending to all members of Governance boards;
- placing in an area accessible to all HT staff and publishing on the institutional website and intranet;
- making available to third parties to whom the Organisational Model applies or to any other party upon request.

In addition, the Foundation promotes and monitors regular training courses covering the Code of Ethics. This SDG is connected with the strategic objectives **'Partnership, networking and stakeholder engagement'** and **'Sustainability (environmental, social and economic)'** and in particular with social sustainability.

03 OUR EXPECTATIONS FOR THE FUTURE

HUMAN TECHNOPOLE IS A PROJECT IN CONTINUOUS EVOLUTION. EVERYONE'S HERITAGE LIKE THE SCIENCE IT PRODUCES

The HT project represents an important opportunity to strengthen the life science scientific community in Italy. It is essential, in order to reach the success of the institute, managing possible risks that may undermine its proper development and take full advantage of opportunities in the short and medium term

3.1 Risks and opportunities 152

3.1 Risks and opportunities

We can identify a series of risks, originating from both the external and internal environment, that could have negative effects on HT's both short-term and medium-term development.

The main risks originating from the **external environment** are as follows:

a) The impact of HT's connotation as a para-public entity in the implementation of deliberate strategies

The complexity and timing that are a feature of public organisations, in order to duly take into account the indications coming from the bodies in charge of overseeing the proper use of public funds, could at any time condition HT's ability to allocate the available resources and implement its strategy, in the forms and manner decided by its internal bodies.

b) The political risk

Changes of scenario in the Italian and international political landscape could influence HT's mission and strategic objectives in the medium term, causing potential uncertainty on the path of the original project realisation.

c) The 'competitive risk' posed by Italian research institutes operating in the same scientific sectors as HT

The likelihood of such risk depends on the type of relationship that HT manages to establish with the other Italian research institutes once the project is fully underway.
Indeed, we might witness friction rather than cooperation with a consequent effect on available resources and HT's national and international attractiveness.

As regards the **internal environment**, the main risks are as follows:

a) Possibility that HT become less attractive to outstanding national and international researchers after shifting the strategic focal point

Partially shifting the focal point of HT activities to the development of national platforms could be seen by potential talented researchers as liable to produce cuts in resources allocated to basic research and therefore in the resultant opportunities, thus making HT less attractive as a place for work and research.

b) Possibility that HT become less attractive to industrial partners after shifting the strategic focal point

Partially shifting the focal point of HT activities to the development of national platforms could be seen by private institutes, potential technology transfer partners, as a drop in HT's interest for such area of activity, thus weakening its relationship with industrial partners.

c) Potentially reduced standing of HT project and loss of reputation with stakeholders

The slowdown in infrastructural investments, also for external reasons, could reduce the standing of the entire project and thus harm HT's reputation as an outstanding national project.

RISK	RISK MANAGEMENT
Potential reduced attractiveness for outstanding national and international researchers after shifting the strategic focal point	HT has developed HRM practices and employment programmes comparable to those offered by internationally recognized institutions. As long as HT will continue to receive stable support from its stakeholders the risk will remain low

RISK	RISK MANAGEMENT
Potential reduced attractiveness for industrial partners after shifting the strategic focal point	HT has launched activities concerning the implementation of a 'Centre for Innovation and Technology Transfer'. This risk can remain low thanks to an efficient activity carried out by CITT in order to attract stakeholders and industrial partners with whom to share initiatives and collaborations

RISK	RISK MANAGEMENT
Potential reduced standing of HT project and declining reputation with stakeholders due to delays in infrastructural investments	While such events have delayed the development of HT already and may well do so in future, HT will work with partners and stakeholders to try to ensure that the lenght of delays is not such as to have a major effect on the realization of HT project. This risk is therefore considered manageable

The **opportunities** that could help HT's short and medium term development and success are as follows:

a) Availability of cutting-edge research infrastructures having a positive effect on HT's image and its attractiveness to the world of science and industry

The state-of-the-art research laboratories and equipment make HT of interest to numerous stakeholders: top researchers, research bodies and universities, industrial partners.

HIGHLY ADVANCED RESEARCH INFRASTRUCTURE

OPPORTUNITY	MAXIMIZATION OF THE POSITIVE EFFECT
The availability of highly advanced research infrastructure has a positive impact on HT's image and makes it attractive to science and industry	HT can maximise the positive effect of this opportunity by developing a "*user access*" strategy, ensuring transparent and effective use of its infrastructure and making it available to the scientific community

b) Availability of substantial financial, technological and human resources to be allocated to scientific research

The availability of substantial, high-quality resources allows the development of important projects and also represents a driving force in obtaining additional, especially financial, resources offered by national and international entities (e.g. participation in competitive calls, grants, etc.).

SIGNIFICANT FINANCIAL, TECHNOLOGICAL AND HUMAN RESOURCES

OPPORTUNITY	MAXIMIZATION OF THE POSITIVE EFFECT
The provision of relevant and quality resources enables the development of important projects and is also an important driver for the acquisition of further resources, especially financial resources, made available by national and international institutions	HT can maximise the effect of this opportunity by developing outstanding projects and collaborations that can attract additional resources from national and international institutes (e.g. participation in tenders, grants)

c) HT's location within the MIND area

MIND is currently one of the most important urban regeneration projects at national level of ever-increasing interest to international investors. HT's location within the MIND district provides an opportunity to develop relationships, collaborative projects and partnerships with the very best organisations and institutes in the field of scientific research and technology transfer, as well as an important public presence for the qualification of the new Milan area.

HT LOCALISATION IN MIND AREA

OPPORTUNITY	MAXIMIZATION OF THE POSITIVE EFFECT
The location of HT in the MIND area, which today represents one of the leading projects at national level that is also increasingly attractive to international investors, represents an opportunity to develop relations, collaborations and partnerships with organisations and institutions of importance in the field of scientific research and technology transfer	HT can maximise the positive effect of this opportunity by developing and caring for relations with MIND area partners, scientific stakeholders and technology transfer partners

d) Opportunities provided by the National Recovery and Resilience Plan

The resources allocated to research by the National Recovery and Resilience Plan (PNRR) represent a great opportunity to develop HT's activities in the short and medium term.

PNRR

OPPORTUNITY	MAXIMIZATION OF THE POSITIVE EFFECT
The resources made available by the PNRR for research represent a significant opportunity for the development of HT activities in the short and medium term	HT can maximise the positive effect of this opportunity by participating in partnerships extended to universities and research centres on scientific research projects

As regards the opportunities provided by the PNRR, discussions have been started that should lead HT to take part as a "spoke member" in the Public notice to submit proposals to set up "Extended partnerships between universities, research centres and businesses to fund basic research projects" – under the terms of the National Recovery and Resilience Plan, Mission 4 "Education and research" – Component 2 "From research to business" – Investment 1.3, funded by the European Union – NextGenerationEU.

04

PERFORMANCE ANALYSIS

The first HT laboratories were completed in the first part of 2021. Meanwhile, Human Technopole researchers have already published tens of papers in prestigious scientific journals. During 2021, HT also awarded with the first external funds through European grants

TRANSPARENCY, COMPLETENESS, RELEVANCE AND COMPREHENSIBILITY GUIDE THE EVALUATION OF OUR PERFORMANCE

4.1 Key performance indicators 158

4.2 Financial statements 168

4.3 Auditors' Report on the Integrated Report 222

4.1 Key performance indicators

The following table gives the performance indicators linked to the Foundation's 8 strategic objectives:

PERFORMANCE INDICATORS/STRATEGIC OBJECTIVES

INNOVATION AND QUALITY OF RESEARCH

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
Number of research groups	20	-	Of which 4 recruited in 2021 but started in 2022
Number of cohort studies involved	8	-	-
Amount of external grant funding (individual fellowship/grant and other research funding) formalised in 2021	1,934,611 Euros of which collected 201k/ Euros as at 31.12.2021	-	-
Amount of external grant funding (individual fellowship/grant and other research funding) formalised in 2022	1,964,204 Euros	-	Additional grants amounting to 4,501,940 Euros were awarded during 2021 and will be formalised during 2022
Number of joint publications with external institutions	53	-	-
Number of publications in international peer-reviewed journals	54	27	-
Number of new experimental methods/tools/protocols	18	-	-

DEVELOPMENT AND PROVISION OF INFRASTRUCTURES, AND INNOVATIVE RESEARCH INSTRUMENTS

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
Investments (amount) in buildings/laboratories/ technologies	54,857,914 Euros	59,863,573 Euros	Additions in the fiscal year
Investments (amount) in intangible assets	4,564 Euros	34,000 Euros	Additions in the fiscal year
% progress of infrastructure development projects (projects on schedule)	% Progress of existing buildings: 96% % Progress of buildings under design: 1% The last stage of the project, final acceptance, is scheduled for April 2027	81%	-
% of square meters dedicated to research laboratories	41%	-	With reference to the South Building, the design estimate includes 15,460 square metres for research laboratories, 11,004 square metres for service areas, and 3,914 square metres for offices

TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
No. of PhD students	30	16	-
No. of postdoc fellows	23	2	-
Number of researchers from foreign institution	50	-	-
Scientific Visitors hosted	10	-	-
Early career fellows funded	5	-	Early career fellows for the call launched in 2020. A new call for proposals has been launched for 2021, providing funding for five additional scientific projects
No. of internal seminar training events for in-house PhD students and postdocs	1	-	-

SCIENTIFIC REPUTATION AND DISSEMINATION

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
Number of participations in conferences with presentation of accepted talks/posters	95	-	-
Number of researchers present in governance roles/bodies/review boards of international institutions/research organisations of excellence	7	-	-
Scientific conferences/courses/training events organised (internal & external)	3	-	-
Number of attendees scientific conferences/ training events organised (internal & external)	71	-	-
No. of dissemination/educational initiatives organised for non-specialist stakeholders	21	1	-
No. of research awards/honours/prizes (by institutions/field)	3	-	-

RESEARCH-BASED INNOVATION

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
CITT (Centre for Innovation and Technology Transfer)	See subchapter 2.2 paragraph "Financial Capital", subchapter 2.3 paragraph "Research-Based Innovation", and subchapter 2.4 paragraph "Industry, innovation and infrastructure (ESG)"	-	-

SUSTAINABILITY (ENVIRONMENTAL, SOCIAL AND ECONOMIC)

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
ENVIRONMENTAL			
Energy from renewable sources	Available 2022 estimate. See subchapter 2.4, paragraph "Affordable and clean energy"	Available 2021 estimate. See chapter 2, par. 2.4 "Responsible and sustainable approach" section "Affordable and clean energy" of the 2020 edition of the Integrated Report	-
SOCIAL			
Diversity & equal opportunity (employees gender)	Men 47% Women 53%	Men 46% Women 54%	GRI 405-1
Diversity & equal opportunity (employees age)	< 30: 9% 31-50: 80% >50: 11%	< 30: 9% 30-50: 78% > 50: 13%	GRI 405-1
% researchers vs staff	41%	23%	-
Transparency in supplier selection	See subchapter 2.2, paragraph "Financial Capital" section "Procurement and Purchases 2021"	-	-
ECONOMIC			
% of resources collected from parties other than the MEF on total collections 2021	0.38%	-	-
Commitments formalised in 2021 not reflected in the Balance Sheet	See subchapter 2.2, paragraph "Financial Capital"	-	-
Other economic and financial data	See subchapter 2.2, paragraph "Financial Capital"	-	-

PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
Number of partnerships and collaborations with universities/ IRCCS/research centres/industry	7	3	-
Number of research infrastructure development projects co-managed with suppliers	1	-	-
Number of initiatives developed in partnership with other MIND area subjects	4	2	-
Number of partnerships with other relevant stakeholder	1	4	-
Indicators for press office activities	Press mentions: 1,766	Press mentions: 1,356	For more information see subchapter 2.2 paragraph “Relational Capital” section “2021 media and social network performance”
Social media indicators	Social media followers: 24,636	Social media followers: 13,668	-
Number of subscribers to newsletter	Newsletter subscribers: 1,002	Newsletter subscribers: 740	-
Number of website single users	Number of website visits: 52,780	Number of website visits: 81,000	-
Number of website visits	100,878	133,714	-

EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES

KPI	2021 DATA/ REFERENCES	2020 DATA/ REFERENCES	NOTES
% of development of digital transformation projects (e.g. SAP)	Data Governance: 18% Cyber Security: 24% IT Governance: 32% PMO: 42% IT Protocol Management System: 95% HR Travel: 40% E-catalogues: 20% Warehouse: 5%	20%	-

The following table gives the performance indicators contained in the GRI standard:

GRI RECONCILIATION STATEMENT OR GRI CONTENT INDEX

GRI	KPI	REFERENCES	NOTES
GRI 101: FOUNDATION 2016		**In the whole report**	
GRI 102: GENERAL DISCLOSURES 2016			
Organisational profile			
102-1	Name of the organisation	Cover	
102-2	Activities, brand, products and services	See subchapter 1.2 "Research Centres and Facilities"	
102-3	Location of headquarters	See subchapter 1.1 "Mission, vision and values"	
102-4	Location of operations	See subchapter 2.2, paragraph "Infrastructural Capital"	
102-5	Ownership and legal form	See subchapter 1.1 "Mission, vision and values"	
102-6 a. ii - a.iii	Markets served	See subchapter 1.2, "Research Centres and Facilities"	
102-7	Scale of the organisation	See subchapter 2.2, paragraph "Financial Capital" and paragraph "Human Capital"	
102-8	Information on employees and other workers	As at 31.12.2021, there were 159 employees, 5 of whom had part-time contracts (3 women and 2 men). There are also PhDs who mainly carry out scientific activities. For more details see subchapter 2.2, paragraph "Human Capital"	
102-9	Supply chain	See subchapter 2.2, paragraph "Financial Capital"	
102-10	Significant changes to the organisation and its supply chain	No significant changes have occurred	
102-11	Precautionary Principle or approach	The Foundation applies the Precautionary Principle, according to which, in the event of serious or irreversible damage, the absence of absolute scientific certainty must not serve as a pretext for postponing the implementation of effective measures to prevent environmental degradation. In support of the above statement, it should be noted that from 2021 the Foundation has committed to implementing a Quality, Health, Safety and Environment Policy. In particular, it will constitute HT’s commitment to the prevention and elimination of hazards, the safeguarding and protection of the environment, the reduction of environmental impacts, the optimisation of the use of energy resources and the use of the best available technologies, and will guarantee compliance with the legal requirements for the environment (Legislative Decree 152/2006 and subsequent amendments and additions - Consolidated Environment Act). For more details see subchapter 2.4, paragraph “Clean water and sanitation” and “Responsible consumption and production”	

GRI	KPI	REFERENCES	NOTES
102-12	External initiatives	See subchapter 2.2, paragraph "Relational Capital", section "Scientific partnerships and collaborations"	
102-13	Membership of associations	See subchapter 2.2, paragraph "Relational Capital", section "Scientific partnerships and collaborations"	
Strategy			
102-14	Statement from senior decision-maker	Letter to stakeholders	
Ethics and integrity			
102-16	Values, principles, standards and norms of behavior	See subchapter 1.1 "Mission, vision and values"	
Governance			
102-18	Governance structure	See subchapter 1.4 "Governance and organisation"	
Stakeholder engagement			
102-40	List of stakeholder groups	See Methodology note and subchapter 2.1 “Stakeholder engagement and the materiality matrix”	
102-41	Collective bargaining agreements	100% of the employees are subject to the provisions of the national contracts and regulations in force in the country where the Foundation operates. In particular, the CCNL for the chemical sector applies to office workers and middle managers, while the CCNL for Industry Managers applies to executives, also taking into account the provisions of the regulations applicable to public administrations (Law 196/09-article 1, paragraph 3)	
102-42	Identifying and selecting stakeholders	See Methodology note and subchapter 2.1 "Stakeholder engagement and the materiality matrix"	
102-43	Approach to stakeholder engagement	See Methodology note and subchapter 2.1 "Stakeholder engagement and the materiality matrix"	
102-44	Key topics and concerns raised	See Methodology note and subchapter 2.1 "Stakeholder engagement and the materiality matrix" and subchapter 3.1 "Risks and opportunities"	
Reporting practice			
102-45	Entities included in the consolidated financial statements	The Foundation does not prepare consolidated financial statements as it does not have any other entities within its scope. At the same time, as of 30th September 2021, HT has been recognised within the list (ISTAT) of public administrations included in the consolidated profit and loss account in accordance with Article 1, p.3, L.31.12.09, No.196	
102-46	Defining report content and topic Boundaries	See Methodology note	
102-47	List of material topics	See Methodology note	
102-48	Restatements of information	No revisions of information	
102-49	Changes in reporting	No significant changes in reporting	
102-50	Reporting period	See Methodology note	
102-51	Date of most recent report	See Methodology note	
102-52	Reporting cycle	See Methodology note	
102-53	Contact point for questions regarding the report	See Methodology note	
102-54	Claims of reporting in accordance with the GRI Standards	See Methodology note	
102-55	GRI content index	GRI Reconciliation Statement	
102-56	External assurance	See Methodology note	
GRI 103: MANAGEMENT APPROACH 2016			
103-1	Explanation of the material topic and its Boundary	See subchapter 2.1 "Stakeholder engagement and the materiality matrix" and subchapter 2.3 "Strategy"	
103-2	The management approach and its components	See subchapter 2.1 “Stakeholder engagement and the materiality matrix” and subchapter 2.3 “Strategy”	
103-3	Evaluation of the management approach	See subchapter 2.1 “Stakeholder engagement and the materiality matrix” and subchapter 2.3 “Strategy”	
GRI 201: ECONOMIC PERFORMANCE 2016			
Topic-specific disclosures			
201-1	Direct economic value generated and distributed	See subchapter 2.2, paragraph "Financial Capital"	
GRI 205: ANTI-CORRUPTION 2016			
Topic-specific disclosures			
205-1	Operations assessed for risks related to corruption	See subchapter 2.2, paragraph "Financial Capital" and subchapter 2.4, ESG No. 16 "Peace, justice and strong institutions"	
205-3	Confirmed incidents of corruption and actions taken	No corruption incidents were detected during 2021	

GRI	KPI	REFERENCES	NOTES
GRI 302: ENERGY 2016			
Topic-specific disclosures			
302-1	Energy consumption within the organisation	See subchapter 2.4, paragraph "Affordable and clean energy"	
GRI 305: EMISSIONS 2016			
Topic-specific disclosures			
305-1	Direct (Scope 1) GHG emissions	See subchapter 2.4, paragraph "Clean water and sanitation"	
GRI 306: WASTE 2020			
Topic-specific disclosures			
306-3 306-4 306-5	Waste generated Waste diverted from disposal Waste directed to disposal	See subchapter 2.4, paragraph “Responsible consumption and production”	Data 2021
GRI 307: ENVIRONMENTAL COMPLIANCE 2016			
Topic-specific disclosures			
307-1	Non-compliance with enrivonmental laws and regulations	During 2021, HT did not identify any non-compliance with environmental laws and/or regulations	
GRI 401: EMPLOYMENT 2016			
Topic-specific disclosures			
401-1 a.	New employee hires and employee turnover	No. 97 divided as follows: Women: 51 Men: 46 < 30: 12 31-50: 77 >50: 8 Italians: 77% Non-Italians: 23%	Data 2021. For more details see subchapter 2.2, section “Human Capital”
401-1 b.	New employee hires and employee turnover	No. 8 divided as follows: Women: 5 Men: 3 < 30: 1 31-50: 6 > 50: 1 Italians: 100%	Data 2021. For more details see subchapter 2.2, section “Human Capital”

GRI	KPI	REFERENCES	NOTES
GRI 403: OCCUPATIONAL HEALTH AND SAFETY 2018			
Topic-specific disclosures			
403-8	Workers covered by an occupational health and safety management system	See subchapter 2.4, paragraph "Decent work and economic growth"	
403-9 a.	Work-related injuries	No accidents at work occurred during 2021	
GRI 404: TRAINING AND EDUCATION 2016			
Topic-specific disclosures			
404-1	Average hours of training per year per employee	See subchapter 2.2, paragraph "Human Capital"	Data on HSE training
GRI 405: DIVERSITY AND EQUAL OPPORTUNITY 2016			
Topic-specific disclosures			
405-1	Diversity of governance bodies and employees (member’s Governance gender)	Men: 68% Women: 32%	Data 2021
405-1	Diversity of governance bodies and employees (empolyees gender)	See subchapter 2.2, paragraph "Human Capital"	
405-1	Diversity of governance bodies and employees (empoyees age)	See subchapter 2.2, paragraph "Human Capital"	
405-1	Diversity of governance bodies and employees (employees origin)	See subchapter 2.2, paragraph "Human Capital"	
405-2	Ratio of basic salary and remuneration of women to men	Research and Facility Area: female managers and executives earn 2% less than men SSA Area: women make up 100% of SSA staff Administration and Governance: women earn the same as men	Source: Gender Equality Plan (data by 2021)
GRI 419: SOCIOECONOMIC COMPLIANCE 2016			
Topic-specific disclosures			
419-1	Non-compliance with laws and regulations in the social and economic area	With reference to the financial year 2021, there were no non-compliances with laws and/or regulations on social and economic matters that resulted in significant fines or non-monetary penalties	

4.2 Financial statements

HT FOUNDATION BALANCE SHEET - ASSETS

BALANCE SHEET - ASSETS - (IN EURO)	31/12/2021	31/12/2020
A) RECEIVABLES FROM SHAREHOLDERS FOR PAYMENTS STILL DUE	**-**	**-**
Receivables from shareholders already called up	-	-
Receivables from shareholders not yet called up	-	-
B) FIXED ASSETS, WITH LEASED ASSETS SHOWN SEPARATELY	**115,623,825**	**60,761,347**
I. Intangible assets	**38,564**	**34,000**
1) Start-up and expansion costs	-	-
2) Research, development and advertising costs	-	-
3) Industrial patent and intellectual property rights	-	-
4) Concessions, licences, trademarks and similar rights	6,981	13,966
5) Start-up	-	-
6) Intangible fixed assets under construction and advances	-	-
7) Other	31,583	20,034
II. Tangible assets	**115,585,261**	**60,727,347**
1) Land and buildings	58,077,835	41,303,566
2) Plant and machinery	1,809,382	2,183
3) Industrial and commercial equipment	27,110,243	-
4) Other assets	24,263,846	426,534
5) Intangible fixed assets under construction and advances	4,323,955	18,995,064
6) Leased	-	-
III. Financial assets	**-**	**-**

BALANCE SHEET - ASSETS - (IN EURO)	31/12/2021	31/12/2020
C) CURRENT ASSETS	**435,998,719**	**391,575,937**
I. Stock	**73,696**	**-**
II. Receivables	**375,445,989**	**308,023,261**
1) from customers	93,594	14,204
within 12 months	93,594	14,204
over 12 months	-	-
5-bis) tax credits	33,140	1,437,105
within 12 months	33,140	1,437,105
over 12 months	-	-
5-quarter) from others	375,319,254	306,571,952
within 12 months	375,319,254	306,571,952
over 12 months	-	-
III. Financial assets not constituting fixed assets	**40,013,999**	**34,005,952**
7) Non-interest-bearing accounts with the General State Treasury	40,013,999	34,005,952
IV. Cash and cash equivalents	**20,465,035**	**49,546,724**
1) Bank and postal accounts	20,464,315	49,546,685
2) Cheques	-	-
3) Cash and valuables on hand	719	39
D) ACCRUED INCOME AND PREPAYMENTS	**562,319**	**418,717**
Discount on loans	-	-
Other	562,319	418,717
TOTAL ASSETS	**552,184,863**	**452,756,001**

HT FOUNDATION BALANCE SHEET - LIABILITIES

BALANCE SHEET - LIABILITIES & EQUITY - (IN EURO)	31/12/2021	31/12/2020
A) SHAREHOLDERS' EQUITY	**404,381,790**	**381,959,527**
I. Endowment fund and reserves	**77,261,869**	**77,261,869**
HT endowment fund	77,261,869	77,261,869
CITT endowment fund	-	-
II. Equity bound by third parties	**-**	**-**
III. Equity bound by Board decision	**-**	**-**
IV. Operating fund	**327,059,490**	**304,654,974**
HT operating fund	246,003,374	294,745,749
NP operating fund	69,569,748	-
CITT operating fund	11,486,368	9,909,225
V. Statutory reserves	**-**	**-**
VI. Reserve for own shares in portfolio	**-**	**-**
VII. Other reserves, shown separately	**-**	**-**
VIII. Retained earnings (losses) from previous year	**42,684**	**28,766**
IX. Profits (losses) for the year	**17,747**	**13,918**
B) PROVISIONS FOR RISKS AND CHARGES	**-**	**-**
C) EMPLOYEE SEVERANCE INDEMNITIES	**564,922**	**220,938**

BALANCE SHEET - LIABILITIES & EQUITY - (IN EURO)	31/12/2021	31/12/2020
D) PAYABLES	**20,652,547**	**9,814,189**
4) Payables to banks	**-**	**60**
within 12 months	-	60
over 12 months	-	-
7) Payables to suppliers	**18,807,062**	**9,064,879**
within 12 months	18,807,062	9,064,879
over 12 months	-	-
12) Tax liabilities	**724,397**	**302,553**
within 12 months	724,397	302,553
over 12 months	-	-
13) Payables to social security institutions	**632,292**	**286,964**
within 12 months	632,292	286,964
over 12 months	-	-
14) Other payables	**488,796**	**159,733**
within 12 months	488,796	159,733
over 12 months	-	-
E) ACCRUALS AND DEFERRALS	**126,585,603**	**60,761,347**
Premium on loans	-	-
Other	126,585,603	60,761,347
TOTAL LIABILITIES & EQUITY	**552,184,863**	**452,756,001**

HT FOUNDATION - INCOME STATEMENT

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
A) VALUE OF PRODUCTION	**36,220,072**	**12,372,887**
1) Revenues from sales and services	-	-
2) Change in stock of work in progress, semi-finished and finished products	-	-
3) Change in work in progress on order	-	-
4) Increase in fixed assets for internal work	-	-
5) Other revenues and income	**36,220,072**	**12,372,887**
a) Other	49,363	235,111
b) HT grants	24,104,554	12,047,001
of which HT operating grants	18,033,953	11,323,493
of which HT capital grants	6,070,601	723,508
c) CITT grants	422,857	90,775
of which CITT capital grants	-	-
of which CITT operating grants	422,857	90,775
d) National Platforms grants	11,581,829	-
e) Grants from other Bodies	61,469	-
of which capital grants other Bodies	-	-
of which operating grants other Bodies	61,469	-
B) COSTS OF PRODUCTION	**35,660,571**	**12,187,935**
6) Raw materials, consumables and goods	**2,596,936**	**889,440**
7) Services	**14,719,853**	**6,252,890**
8) Lease / rent	**1,640,201**	**164,767**
9) Personnel costs	**10,580,270**	**4,154,009**
a) Salaries and wages	7,808,324	3,016,694
b) Social contributions	2,029,381	920,692
c) Severance pay	496,983	195,321
d) Pensions and similar benefits	63,499	21,302
e) Other costs	182,084	-
10) Depreciation and write-downs	**6,070,601**	**723,508**
a) Amortisation of intangible fixed assets	11,906	9,847
b) Depreciation of tangible fixed assets	6,058,695	713,661
c) Other write-downs of fixed assets	-	-
d) Impairment of receivables in current and liquid assets	-	-
11) Changes in stock of raw, ancillary and consumable materials and goods	**(73,696)**	**-**
14) Other operating costs	**126,407**	**3,321**
Difference between Value and Cost of Production	**559,501**	**184,951**
C) FINANCIAL INCOME AND COSTS	**785**	**(2,028)**
16) Other financial income	**1,968**	**570**
17) Interest and other financial charges	**(112)**	**(161)**
17-bis) Exchange gains and losses	**(1,072)**	**(2,437)**
D) VALUE ADJUSTMENTS ON FINANCIAL ASSETS	**-**	**-**
Profit before tax	**560,285**	**182,924**
20) Income tax for the year	**542,538**	**169,006**
a) Current taxes	542,538	169,006
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expenses) from adoption of tax consolidation/tax transparency regime	-	-
21) Profit (loss) for the year	**17,747**	**13,918**

HT FOUNDATION - CASH FLOW STATEMENT

INDIRECT METHOD – DESCRIPTION	31/12/2021	31/12/2020
A. CASH FLOWS FROM OPERATING ACTIVITIES		
Profit (loss) for the year	17,747	13,918
Income tax	542,538	169,006
Interest paid (interest earned)	(1,856)	(409)
(Dividends)	-	-
Capital (gains) / losses on disposal of assets	-	-
1. Profit (loss) for the year before income taxes, interest, dividends and capital gains/losses	**558,429**	**182,515**
Adjustments for non-monetary items that have no offsetting items in net working capital		
Provisions to funds	-	-
Amortisation/depreciation of fixed assets	6,070,601	723,508
Permanent impairment losses	-	-
Adjustments of financial gains and losses on derivative financial instruments not involving monetary movements	-	-
Other adjustments up/(down) for non-monetary items	-	-
Total adjustments for non-monetary items that have no offsetting items in net working capital	6,070,601	723,508
2. Cash flow before changes in net working capital	**6,629,029**	**906,023**
Changes in net working capital		
Decrease/(increase) in inventories	(73,696)	-
Decrease/(increase) in receivables from customers	(79,391)	(14,204)
Increase/(decrease) in payables to suppliers	9,742,183	7,721,961
Decrease/(increase) in accrued income and prepaid expenses	(143,602)	(231,255)
Increase/(decrease) in accrued expenses and deferred income	65,824,257	60,723,315
Other decreases/(increases) in net working capital	(66,448,617)	(53,453,623)
Total changes in net working capital	8,821,134	14,746,194
3. Cash flow after changes in net working capital	**15,450,164**	**15,652,217**
Other adjustments		
Interest earned/(paid)	1,856	409
(Income taxes paid)	(341,023)	(7,100)
Dividends received	-	-
(Use of funds)	343,984	137,147
Other receipts/(payments)	-	-
Total other adjustments	4,817	130,456
CASH FLOW FROM OPERATING ACTIVITIES (A)	**15,454,981**	**15,782,673**
B. CASH FLOWS FROM INVESTING ACTIVITIES		
Tangible fixed assets	**(60,916,609)**	**(60,577,234)**
(Investments)	(60,916,609)	(60,577,234)
Disinvestments	-	-
Intangible fixed assets	**(16,470)**	**(43,847)**
(Investments)	(16,470)	(43,847)
Disinvestments	-	-
Financial fixed assets	**-**	**-**
(Investments)	-	-

INDIRECT METHOD – DESCRIPTION	31/12/2021	31/12/2020
Disinvestments	-	-
Financial assets not held as fixed assets	**(6,008,047)**	**(34,005,952)**
(Investments)	(6,008,047)	(34,005,952)
Disinvestments	-	-
(Acquisition of business units net of cash and cash equivalents)	**-**	**-**
Disposal of business units net of cash and cash equivalents	**-**	**-**
CASH FLOW FROM INVESTING ACTIVITIES (B)	**(66,941,126)**	**(94,627,033)**
C. CASH FLOWS FROM FINANCING ACTIVITIES		
Third-party financing		
Increase (Decrease) in current bank liabilities	(60)	(2,032)
Loans taken out	-	-
(Repayment of loans)	-	-
Own financing		
Increase in endowment fund	-	31,312
Increase in operating fund	22,404,516	49,200,876
(Dividends and interim dividends paid)	-	-
CASH FLOW FROM FINANCING ACTIVITIES (C)	**22,404,456**	**49,230,156**
INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS (A+-B+-C)	**(29,081,689)**	**(29,614,204)**
Exchange rate effect on cash and cash equivalents	-	-
Cash and cash equivalents at the beginning of the year		
Bank and postal accounts	49,546,685	79,160,734
Cheques	-	-
Cash and valuables in hand	39	194
Total cash and cash equivalents at beginning of year	**49,546,724**	**79,160,928**
Of which not freely usable	-	-
Cash and cash equivalents at end of year		
Bank and postal accounts	20,464,315	49,546,685
Cheques	-	-
Cash and valuables in hand	719	39
Total cash and cash equivalents at end of year	**20,465,035**	**49,546,724**
Of which not freely usable	-	-

INCOME STATEMENT - CITT DETAIL

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
A) VALUE OF PRODUCTION	**422,857**	**90,775**
1) Revenues from sales and services	**-**	**-**
2) Change in stock of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on order	**-**	**-**
4) Increase in fixed assets for internal work	**-**	**-**
5) Other revenues and income	**422,857**	**90,775**
a) Other	-	-
b) HT grants	-	-
of which HT operating grants	-	-
of which HT capital grants	-	-
c) CITT grants	422,857	90,775
of which CITT capital grants	-	-
of which CITT operating grants	422,857	90,775
d) National Platforms grants	-	-
e) Grants from other Bodies	-	-
of which capital grants other Bodies	-	-
of which operating grants other Bodies	-	-
B) COSTS OF PRODUCTION	**422,857**	**90,775**
6) Raw materials, consumables and goods	**-**	**-**
7) Services	**386,115**	**59,553**
8) Lease / rent	**-**	**-**
9) Personnel costs	**36,742**	**31,222**
a) Salaries and wages	36,742	23,698

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
b) Social contributions	-	5,929
c) Severance pay	-	1,222
d) Pensions and similar benefits	-	373
e) Other costs	-	-
10) Depreciation and write-downs	**-**	**-**
a) Amortisation of intangible fixed assets	-	-
b) Depreciation of tangible fixed assets	-	-
c) Other write-downs of fixed assets	-	-
d) Impairment of receivables in current and liquid assets	-	-
11) Changes in stock of raw, ancillary and consumable materials and goods	**-**	**-**
14) Other operating costs	**-**	**-**
Difference between Value and Cost of Production	**-**	**-**
C) FINANCIAL INCOME AND COSTS	-	-
16) Other financial income	**-**	**-**
17) Interest and other financial charges	**-**	**-**
17-bis) Exchange gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS ON FINANCIAL ASSETS	**-**	**-**
Profit before tax	**-**	**-**
20) Income tax for the year	**-**	**-**
a) Current taxes	-	-
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expenses) from adoption of tax consolidation/tax transparency regime	-	-
21) Profit (loss) for the year	**-**	**-**

INCOME STATEMENT - DETAIL OF COMMERCIAL ACTIVITY

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
A) VALUE OF PRODUCTION	**37,077**	**13,918**
1) Revenues from sales and services	**-**	**-**
2) Change in stock of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on order	**-**	**-**
4) Increase in fixed assets for internal work	**-**	**-**
5) Other revenues and income	**37,077**	**13,918**
a) Other	37,077	13,918
b) HT grants	-	-
of which HT operating grants	-	-
of which HT capital grants	-	-
c) CITT grants	-	-
of which CITT capital grants	-	-
of which CITT operating grants	-	-
d) National Platforms grants	-	-
e) Grants from other Bodies	-	-
of which capital grants other Bodies	-	-
of which operating grants other Bodies	-	-
B) COSTS OF PRODUCTION	**995,684**	**230,293**
6) Raw materials, consumables and goods	**136,697**	**-**
7) Services	**459,105**	**90,261**
8) Lease / rent	**-**	**-**
9) Personnel costs	**52,230**	**20,524**
a) Salaries and wages	47,422	15,367

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
b) Social contributions	4,150	3,915
c) Severance pay	659	987
d) Pensions and similar benefits	-	254
e) Other costs	-	-
10) Depreciation and write-downs	**239,016**	**119,508**
a) Amortisation of intangible fixed assets	-	-
b) Depreciation of tangible fixed assets	239,016	119,508
c) Other write-downs of fixed assets	-	-
d) Impairment of receivables in current and liquid assets	-	-
11) Changes in stock of raw, ancillary and consumable materials and goods	**-**	**-**
14) Other operating expenses	**108,637**	**-**
Difference between Value and Cost of Production	**(958,608)**	**(216,375)**
C) FINANCIAL INCOME AND COSTS	**-**	**-**
16) Other financial income	**-**	**-**
17) Interest and other financial charges	**-**	**-**
17-bis) Foreign exchange gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS ON FINANCIAL ASSETS	**-**	**-**
Profit before tax	**(958,608)**	**(216,375)**
20) Income tax for the year	**258,126**	**62,557**
a) Current taxes	258,126	62,557
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expenses) from adoption of tax consolidation/tax transparency regime	-	-
21) Profit (loss) for the year	**(1.216.734)**	**(278.932)**

PART A - INTRODUCTION

The Human Technopole Foundation - hereinafter: HT Foundation, Foundation or simply HT - was established by Article 1, paragraph 116, of Law no. 232 of 11th December 2016.

The financial year ending 31st December 2021 was the Foundation's fourth year of operation and was marked by a growth in scientific activity with the launch of new research and development of the HT Campus infrastructure, including the purchase of the Cardo/South Pavilion and US6/North Pavilion buildings.

The figures shown in these financial statements take into account the forecasts contained in the Convention, envisioned by Budget Law no. 160 of 27th December 2019, Article 1 - paragraphs 275 to 277, which the Foundation signed on 30th December 2020 with the Founding Ministries - Ministry of University and Research, Ministry of Economy and Finance and Ministry of Health.

More specifically, the Convention assigns HT, with its mission as an infrastructure hub supporting national scientific research, the task of funding new and established 'scientific infrastructural facilities', defined as 'facilities, resources and related services, used by the scientific community to conduct high quality research in their respective fields, without any institutional or national affiliation'.

Within the scope of this mandate, the HT Foundation is, inter alia, required to allocate not less than 55% (fifty-five per cent) per annum of public funding received pursuant to Article 1, paragraph 121, of Law no. 232 of 11th December 2016, excluding: "facilities under construction in accordance with the provisions of the Multi-Year Strategic Plan for Scientific Activity referred to in Articles 13.3(b) and 18.2(a) of HT Foundation's By-Laws, and the resources necessary for their construction, operation and maintenance".

It should be noted that on 15th February 2022, pursuant to Article 5 of the Convention, the annual statement of costs incurred during financial year 2021 was submitted, illustrating the management, administrative and accounting procedures adopted in accordance with the instructions for the use of the annual resources allocated to the Foundation. At the date of presentation of this budget to the Management Committee, the Foundation is still waiting for final feedback from the Ministries.

These financial statements, submitted for your examination and approval, show a positive operating result for the year of €17,747.

The following is a summary of the public grants received and the use of financial resources during the year.

YEAR	GRANTS	ACTIVITIES	AMOUNT (EURO)
2018 2019	MEF-HT	Grant amount received on 22.10.2018	6,531,520
	MEF-HT	Endowment fund amount received on 27.12.2019	77,140,000
		Disbursements from 01.11.2018 to 31.12.2018	137,790
		Disbursements from 01.01.2019 to 31.12.2019	4,372,803
		Residual liquidity at 31.12.2019	**79,160,927**
2020	MEF-HT	Grant amount received on 11.08.2020	35,812,898
	MEF-HT	Grant amount received on 17.12.2020	24,005,952
	MEF-CITT	Grant amount received on 17.12.2020	10,000,000
	MEF-HT	Collection of residual endowment fund on 26.05.2020	31,312
		Reimbursement of costs/recharges from 01.01.2020 to 31.12.2020	90,063
		Disbursements from 01.01.2020 to 31.12.2020	65,520,110
		Disbursements from 01.01.2020 to 31.12.2020 CITT	28,426
		Residual liquidity at 31.12.2020	**83,552,616**
2021	MEF-HT	Grant amount received on 09.10.2021 BDI	7,818,663
	MEF-HT	Grant amount received on 21.09.2021 BDI	30,763,999
	MEF-HT	Grant amount received on 16.12.2021 BDI	17,978,376
		Other receipts from 01.01.2021 to 31.12.2021 (Banca Intesa) CITT	807
	EXTRA MEF	Grant amount received on 27.09.2021 (EMBO)	16,250
	EXTRA MEF	Grant amount received on 02.12.2021 (GOOGLE IRELAND LIMITED)	8,747
	EXTRA MEF	Grant amount received on 13.12.2021 (LONGEVITY IMPETUS)	176,062
	EXTRA MEF	Grant amount received on 24.12.2021 (MAECI)	12,810
		Net disbursements from 01.01.2021 to 31.12.2021 (Banca Intesa)	79,850,014
TOTAL		**RESIDUAL LIQUIDITY AT 31.12.2021**	**60,478,314**

SIGNIFICANT EVENTS DURING THE YEAR

Reference should be made in full to the Management Report.

FORMATION CRITERIA

The Financial Statements for the year ended 31st December 2021 were drafted in accordance with Articles 2423 et seq. of the Italian Civil Code, in the extended form, even though the prerequisites set out in Article 2435-bis for preparation in an abbreviated form were met. The formation and valuation criteria take into account the rules of Italian legislation pursuant to Legislative Decree 139/2015, implementing Directive 2013/34/EU.
The figures shown in the statements are in euros, rounded to the nearest unit. Any rounding differences were posted to the "Euro rounding reserve" included among the equity items. Pursuant to Article 2423, paragraph 6 of the Italian Civil Code, the Notes to the Financial Statements were drawn up in euros.
The Notes to the Financial Statements present information on the balance sheet and income statement items in the order in which the items appear in the statements themselves.

DRAFTING PRINCIPLES

Valuation of the items in the financial statements was based on general criteria of prudence and accrual, with a view to the continuation of business.

In line with the accrual principle, the impact of transactions and other events was booked and attributed to the financial year in which such events and transactions occurred, and not to that in which the relative cash movements (receipts and payments) occurred.

Applying the principle of materiality, the obligations regarding recognition, measurement, presentation and disclosure were not complied with if their observance was immaterial to giving a true and fair view.

Application of the same valuation principles makes it possible to compare the Foundation's financial statements for different years.
The recognition and presentation of items in the financial statements was made taking into account the substance of the transaction or contract.

The financial statements consist of the "Balance Sheet", the "Income Statement", the "Cash Flow Statement", the "Notes to the Financial Statements" and the "Management Report".

The Balance Sheet is organised by macro-classes, in accordance with the criterion of increasing liquidity, while the groupings and items are subdivided by kind.

The various balance sheet items are shown net of the relevant adjustment items.

Memorandum accounts are no longer included in the financial statements and are described in these notes.

The Income Statement was prepared in accordance with the format established by Article 2425 of the Italian Civil Code and represents the Foundation's operational management.
The format presents the cost and revenue structure of production, with scalar development and content reflecting an ordering of costs by kind.

The Income Statement is divided into areas that highlight:

Ordinary operations, (items A and B), which consist of the Foundation's routine and non-routine activities and whose result is indicated by the definition: "Difference between production value and costs";

Financial management, (items C and D), which refers to costs and income arising from the provision of funds and their temporary investment pending use in ordinary operations;

Income taxes, (item 20), consist of direct taxes (IRAP and IRES) on taxable income for the year. They are accounted for on the basis of the taxable income for the year and in compliance with the prevailing tax regulations. At the close of the financial year, there were no deferred tax liabilities or prepaid tax assets.

Comparison with the previous accounting period is achieved by two separate columns for the current year and for the previous year.

The Cash Flow Statement is a component of the Financial Statements. Note that the Foundation, in compliance with the provisions of OIC 10, adopts the indirect method format.

The Notes to the Financial Statements were drafted in order to clarify, complete and analyse the information contained in the Balance Sheet, Income Statement and Cash Flow Statement, and to provide details on the valuation criteria, and variations in the various asset and liability items.

It is an integral part of the Financial Statements and provides descriptive and tabular information on the balance sheet, income statement and financial position.

EXCEPTIONS PURSUANT TO ARTICLE 2423, PARAGRAPH 5, OF THE ITALIAN CIVIL CODE

There were no exceptional cases that required recourse to dispensations pursuant to Article 2423 paragraph 5 of the Civil Code.

VALUATION CRITERIA

FIXED ASSETS

Intangible fixed assets

These are booked at historic purchase cost, including ancillary costs and VAT (where non-deductible if the asset is intended for routine activity), and recognised net of amortisations and attributed directly to the individual items.

Licenses, concessions and trademarks are amortised at an annual rate of 20%.

In the event of an impairment, regardless of any depreciations already booked, the asset is written down. Should the reasons for the write-down cease to apply in subsequent years, the original adjusted value of the amortisations is recovered.

Tangible fixed assets

These are booked at purchase cost, including ancillary expenses and non-deductible VAT, and adjusted by the corresponding accumulated depreciation. Depreciation, posted to the income statement, was calculated on the basis of the residual useful life of the asset, taking into account its use and economic-technical duration, which we believe is well reflected in the following rates, reduced by half in the year the asset enters operation:

ASSET TYPE	% DEPRECIATION
Industrial buildings	3%
Plant and machinery	10%
Furniture and fittings	12%
Electronic office machinery	20%
Mobile phones	20%
Servers	20%

In the event of an impairment, regardless of any depreciations already booked, the asset is written down. Should the reasons for the write-down cease to apply in subsequent years, the original adjusted value of the amortisations is recovered.

STOCK

Inventories of consumables, goods and finished goods are posted to the balance sheet at their purchase value.

This figure is not significantly different from a valuation at weighted average cost.

RECEIVABLES

These are recognised at their estimated realisable value without applying the amortised cost method, given that as current receivables the effects of this method would be insignificant.

FINANCIAL ASSETS NOT CONSTITUTING FIXED ASSETS

The new accounting principle OIC 14, alters, from FY 2016, the classification and valuation of cash and cash equivalents, restricting them to bank and postal accounts where they are collectible at spot and usable for any business purpose. In the light of this new ruling, two important aspects of the assets held in the Foundation's treasury accounts with the Bank of Italy should be highlighted:

- they are not collectible on a spot basis (given the procedure and withdrawal limits imposed by law and the guidelines agreed with the State General Accounting Office (RGS));
- there are strong similarities with treasury management methods given that the Foundation cannot access these funds directly, but only after requesting authorisation and transfer to the RGS.

In compliance with the new OIC 14, therefore, the HT Foundation assets held in with the Bank of Italy are recognised under "Financial assets not constituting fixed assets" at nominal value.

SHAREHOLDERS' EQUITY

The equity of non-commercial entities is intended on a long-term basis to support the purchase of essential production factors, whether current or as investments. Its nature is therefore definable as a "purpose fund", to be allocated as needed to achieve the Foundation's statutory purposes.

PAYABLES

These are booked at nominal value, seen as representative of their settlement value and substantially in line with the amortised cost criterion.

Payables in foreign currency are recognised on the basis of the exchange rates prevailing on the date of the transaction. Foreign currency gains or losses arising from the year-end exchange rate are credited or debited to the year.

"Payables to suppliers", in addition to the amounts due for invoices received, also include the value of invoices for services rendered and orders delivered, not yet received by the closing of the financial year.

"Tax liabilities" include amounts deducted as withholding agent, direct IRAP and IRES taxes for the year as well as indirect taxes. The latter are calculated on the basis of a realistic forecast of the taxes due, taking into account the prevailing regulations, and are recognised net of any advances paid.

"Payables to pension and social security institutions" include social security contributions for employees and staff, accrued and not paid at the close of the year, including amounts due to private pension funds for those who took advantage of the option provided by Law no. 296 of 27.12.2006 concerning the allocation of severance pay from 1st January 2007.

"Other payables" comprise liabilities which by their nature do not fall under the previous items, including payables to employees accrued to them under the current legislation, including holidays and other benefits accrued but not taken at the date of the financial statements.

ACCRUALS AND DEFERRALS

These are determined according to the temporal accrual accounting principle.
"Prepaid expenses" include costs incurred before the end of the financial year for the portion pertaining to the following year.
"Deferred income" includes income realised before the end of the financial year but accruing to the following year.

SEVERANCE FUND

This represents the effective liability accrued in respect of employees as provided by the law and the ongoing labour agreements, taking into account every form of continuous remuneration.
The fund represents the total amount due to employees at the balance sheet closing date, net of advances paid, and corresponds to the amount payable were the employment relationship to be terminated at that date. The item depends on the severance pay accrued by most of the employees, who chose to keep it within the company, not availing themselves of the option provided by Law no. 296 of 27th December 2006 to pay the amount accrued from 1st January 2007 into a private pension fund.

INCOME TAX

Taxes are set aside on an accrual basis and in accordance with current tax regulations.

At the close of the financial year, there were no deferred tax liabilities or prepaid tax assets.

INCOME AND EXPENSES

These are recognised on an accrual basis, irrespective of the date of collection or payment, and on a prudent basis, with a view to preserving the value of Human Technopole's assets and in anticipation of the continuation of the business.

OPERATING GRANTS

Pursuant to accounting principle no. 1 for not-for-profit entities, grants received for the financial year, either by law or contractually, relating to the Foundation's specific activities, are recognised on an accrual basis, in relation to the incurred expenses to which they refer, regardless of whether they were received.
In this regard, the principle states that: "where a correlation between income, of a non-monetary nature, can be identified, it can be correlated with the expenses of the financial year. This correlation constitutes a fundamental corollary of the accrual recognition of events characterising routine activities and expresses the need to offset the charges of the financial year, whether certain or presumed, against the related revenues". Since these grants are specifically related to the Foundation's routine activities, they are posted to the income statement under item A5) "Other revenues and income", and indicated separately under the sub-item "Operating grants".

The costs pertaining to the financial year are partly covered by use of the grants deferred in the previous financial year, in part through recognition of the portion pertaining to the future under deferred income, and partly through the use of the "Operating Fund".

CAPITAL GRANTS

Grants received in full are recognised on the balance sheet as deferred income and are reduced at the end of each tax period by posting to the income statement a portion determined on the basis of the useful life of the asset acquired.
In accordance with the principles set out in OIC No. 16, letter F.II.a), capital grants received from the State (included in the mixed grant awarded annually in relation to investment plans for the acquisition of depreciable assets and other expenses with specific reference to orders formalised by the end of the financial year) are also recognised on this basis for the portion intended for the purchase of tangible fixed assets, commensurate with the cost of the investments and with the constraints on their use in connection with the Foundation's statutory and legal mission.

Capital grants are recognised using the "income method", whereby the amount is posted to the income statement under "Other revenues and income", and booked to future years under deferred income, with depreciation posted to the income statement on the gross cost of assets equal to the portion of the grant attributable to the year.

GRANTS FROM OTHER BODIES

Grants relating to European research projects and similar funding from other entities (banks or other public or private institutions) are recognised, in accordance with the accounting principle for not-for-profit entities No. 1, at the time of disbursement, as deferred income and, at the end of the financial year, booked as "income" on the basis of costs incurred (if the grant was made during the year).

OTHER REVENUES AND INCOME

This includes all non-financial income from ancillary activities, which in the case of the Foundation mainly relate to the rental of certain spaces used for commercial activities. The item also includes fees received from other entities in connection with scientific projects of a commercial nature.

MEMORANDUM ACCOUNTS

A section of the Notes to the Financial Statements shows the commitments entered into by the Foundation, in particular, the value of contracts for which there is a revocable commitment to make future payments.

PART B - INFORMATION ON BALANCE SHEET ASSETS

FIXED ASSETS

INTANGIBLE FIXED ASSETS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
38,564	34,000	4,564

Intangible fixed assets arise from increases during the financial year ending 31/12/2021 and consist of "Other intangible fixed assets".

MOVEMENTS IN INTANGIBLE FIXED ASSETS

	START-UP AND EXPANSION COSTS	DEVELOPMENT COSTS	INDUSTRIAL PATENT RIGHTS AND INTELLECTUAL PROPERTY RIGHTS	CONCESSIONS, LICENCES, TRADEMARKS, AND SIMILAR RIGHTS	START-UP	INTANGIBLE ASSETS UNDER CONSTRUCTION AND ADVANCES	OTHER INTANGIBLE ASSETS	TOTAL INTANGIBLE FIXED ASSETS
VALUE AT START OF YEAR								
Cost	-	-	-	20,951	-	-	22,896	**43,847**
Revaluations	-	-	-	-	-	-	-	-
Depreciation (Depreciation fund)	-	-	-	(6,985)	-	-	(2,862)	**(9,847)**
Write-downs	-	-	-	-	-	-	-	-
Book value	-	-	-	13,966	-	-	20,034	**34,000**
CHANGES DURING THE YEAR								
Increases due to acquisitions	-	-	-	-	-	-	16,470	**16,470**
Reclassifications (of book value)	-	-	-	-	-	-	-	**-**
Decreases due to disposals and divestments (of book value)	-	-	-	-	-	-	-	-
Revaluations carried out during the year	-	-	-	-	-	-	-	-
Depreciation for the year	-	-	-	(6,985)	-	-	(4,921)	**(11,906)**
Write-downs during the year	-	-	-	-	-	-	-	-
Other changes	-	-	-	-	-	-	-	-
Total changes	-	-	-	(6,985)	-	-	11,549	**4,564**
YEAR-END VALUE								
Cost	-	-	-	20,951	-	-	39,366	**60,317**
Revaluations	-	-	-	-	-	-	-	-
Depreciation (Depreciation fund)	-	-	-	(13,970)	-	-	(7,783)	**(21,753)**
Write-downs during the year	-	-	-	-	-	-	-	-
Book value	-	-	-	6,981	-	-	31,583	**38,564**

TANGIBLE FIXED ASSETS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
115,585,261	60,727,347	54,857,914

MOVEMENTS IN TANGIBLE FIXED ASSETS

	LAND AND BUILDINGS	PLANT AND MACHINERY	INDUSTRIAL AND COMMERCIAL EQUIPMENT	OTHER ASSETS	TANGIBLE FIXED ASSETS UNDER CONSTRUCTION AND ADVANCES	TOTAL TANGIBLE FIXED ASSETS
VALUE AT START OF YEAR						
Cost	41,932,554	2,509	-	552,465	18,995,064	**61,482,593**
Revaluations	-	-	-	-	-	**-**
Depreciation (Depreciation fund)	(628,988)	(326)	-	(113,846)	-	**(743,160)**
Write-downs	-	-	-	(12,086)	-	**(12,086)**
Book value	41,303,566	2,183	-	426,534	18,995,064	**60,727,347**
CHANGES DURING THE YEAR						
Increases due to acquisitions	18,272,842	1,905,110	27,503,171	11,594,177	1,641,309	**60,916,609**
Reclassifications (of book value)	34,006	-	2,519,788	13,758,624	(16,312,419)	**-**
Decreases due to disposals and divestments (of book value)	-	-	-	-	-	**-**
Revaluations carried out during the year	-	-	-	-	-	**-**
Depreciation for the year	(1,532,579)	(97,911)	(2,912,716)	(1,515,488)	-	**(6,058,695)**
Write-downs during the year	-	-	-	-	-	**-**
Other changes	-	-	-	-	-	**-**
Total changes	16,774,269	1,807,199	27,110,243	23,837,313	(14,671,109)	**54,857,914**
YEAR-END VALUE						
Cost	60,239,403	1,907,619	30,022,959	25,905,266	4,323,955	**122,399,202**
Revaluations	-	-	-	-	-	**-**
Depreciation (Depreciation fund)	(2,161,568)	(98,237)	(2,912,716)	(1,629,334)	-	**(6,801,855)**
Write-downs during the year	-	-	-	(12,086)	-	**(12,086)**
Book value	58,077,835	1,809,382	27,110,243	24,263,846	4,323,955	**115,585,261**

The value of tangible fixed assets has increased compared to the previous year by €54,857,914.

In particular, note the change in the item "Land and buildings", which is attributable to the acquisition of the Cardo-South Pavilion and the US6-North Pavilion for approximately €18 million, as well as the item "Industrial and commercial equipment" for the purchase of the Cryo Electron Microscope. In addition, there was a significant reduction in the item "Assets under construction and advances", due to the reclassification of part of the assets under the items "Industrial and commercial equipment" and "Other assets".

The total value of "Other assets" is broken down as follows:

II 4) OTHER ASSETS	FURNITURE AND FITTINGS	LIGHTWEIGHT CONSTRUCTIONS	LABORATORY FURNITURE AND FITTINGS	ELECTROMECHANICAL AND ELECTRONIC OFFICE EQUIPMENT
Historical cost	11,432	-	-	541,034
Depreciation of previous years	(4,324)	-	-	(121,608)
BALANCE AT 31/12/2020	**7,108**	**-**	**-**	**419,426**
Acquisitions during the year	75,936	16,267,209	5,113,213	3,896,443
Depreciation for the year	(6,794)	(813,360)	(178,520)	(516,815)
BALANCE AT 31/12/2021	**76,250**	**15,453,849**	**4,934,693**	**3,799,054**

The increase in the item "Lightweight constructions" is due to the purchase of structures for the "Incubator Labs" which were delivered to the Foundation after the first conformity assessment.

The item "Tangible fixed assets under construction and advances" amounts to €4,323,955.

Note that in FY 2021, reclassifications were made under the item "Tangible fixed assets under construction and advances" amounting to approximately €16 million.

CURRENT ASSETS

STOCK

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
73,696	-	73,696

STOCK	VALUE AT START OF FY	VARIATION DURING THE FY	VALUE AT END OF FY
Raw and ancillary materials, consumables	-	73,696	73,696
TOTAL STOCK	**-**	**73,696**	**73,696**

RECEIVABLES BOOKED AS CURRENT ASSETS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
375,445,989	308,023,261	67,422,728

Variations and receivables at maturity included in current assets:

	VALUE AT START OF FY	VARIATION DURING THE FY	VALUE AT END OF FY	PORTION DUE WITHIN FY	PORTION DUE BEYOND FY	OF WHICH WITH A RESIDUAL MATURITY OF MORE THAN 5 YEARS
Receivables from customers included in current assets	14,204	79,391	93,594	93,594	-	-
Tax receivables booked as current assets	1,437,105	(1,403,965)	33,140	33,140	-	-
Receivables from others included in current assets	306,571,952	68,747,302	375,319,254	375,319,254	-	-
TOTAL RECEIVABLES BOOKED AS CURRENT ASSETS	**308,023,261**	**67,422,728**	**375,445,989**	**375,445,989**	**-**	**-**

The item "Receivables from customers" at 31/12/2021 is made up as follows:

DESCRIPTION	AMOUNT
Receivables from customers - Italy	21,651
Receivables for invoices to be issued - Italy	-
Receivables for invoices to be issued - foreign customers	71,943
TOTAL	**93,594**

The item "Tax receivables" at 31/12/2021 amounts to €33,140, made up of HT Foundation's VAT credit with the tax authorities following a transaction in the commercial area.

It should be noted that the VAT credit at 31/12/2020 was used entirely to offset other taxes.

The item "Receivables from others" at 31/12/2021, amounting to €375,319,254 is made up as follows:

DESCRIPTION	AMOUNT
Due from the State for grants as yet unpaid	374,088,591
Credit notes to be received	1,084,422
Others	146,241
TOTAL	**375,319,254**

The item "Due from the State for grants as yet unpaid" amounts to €374,088,591 and consists of the grants referred to in Article 1, paragraph 121 of Law no. 232 of 11th December 2016, for the years 2018, 2019, 2020 and 2021 for €372,088,591 and the grants pursuant to Legislative Decree no. 34/2020 (CITT) for 2021 for €2,000,000, for the portion not collected at the close of the financial year, as summarised in the following tables:

PERIOD	GRANTS UNDER L. 232/2016	GRANTS DISBURSED AT 31.12.2019	RESIDUAL GRANTS AT 31.12.2019	GRANTS DISBURSED AT 31.12.2020	RESIDUAL GRANTS AT 31.12.2020	GRANTS DISBURSED AT 31.12.2021	RESIDUAL GRANTS AT 31.12.2021
2017	10,000,000	6,531,520	3,468,480	3,468,480	-	-	-
2018	114,300,000	-	114,300,000	56,350,370	57,949,630	56,561,038	1,388,591
2019	136,500,000	-	136,500,000	-	136,500,000	-	136,500,000
2020	112,100,000	-	-	-	112,100,000	-	112,100,000
2021	122,100,000	-	-	-	-	-	122,100,000
TOTAL	**495,000,000**	**6,531,520**	**254,268,480**	**59,818,850**	**306,549,630**	**56,561,038**	**372,088,591**

PERIOD	GRANTS UNDER DL 34/2020 (CITT)	GRANTS DISBURSED AT 31.12.2019	RESIDUAL GRANTS AT 31.12.2019	GRANTS DISBURSED AT 31.12.2020	RESIDUAL GRANTS AT 31.12.2020	GRANTS DISBURSED AT 31.12.2021	RESIDUAL GRANTS AT 31.12.2021
2020	10,000,000	-	-	10,000,000	-	-	-
2021	2,000,000	-	-	-	-	-	2,000,000
TOTALE	**12,000,000**	**-**	**-**	**10,000,000**	**-**	**-**	**2,000,000**

Regarding the item "Credit notes to be received", the balance is due to invoices received with VAT incorrectly applied (Split payment).

The account has been moved to track incorrect invoices awaiting credit notes.

BREAKDOWN OF RECEIVABLES BOOKED AS CURRENT ASSETS BY GEOGRAPHICAL AREA

The breakdown of receivables at 31/12/2021 by geographical area is not considered significant.

FINANCIAL ASSETS NOT CONSTITUTING FIXED ASSETS

Variations in financial assets not constituting fixed assets:

	BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
Financial assets not constituting fixed assets	40,013,999	34,005,952	6,008,047

DESCRIPTION	VALUE AT START OF FY	VARIATIONS DURING THE FY	VALUE AT END OF FY
Non-interest bearing accounts with the State Treasury	34,005,952	6,008,047	40,013,999
TOTAL FINANCIAL ASSETS NOT CONSTITUTING FIXED ASSETS	**34,005,952**	**6,008,047**	**40,013,999**

Article 49-bis, paragraph 4 of Law Decree no. 34 of 19th May 2020, converted with amendments by Law no. 77 of 17th July 2020, added the following sentence to the law establishing HT Foundation, specifically, Article 1, paragraph 121 of Law no. 232/2016: "Grants to the Foundation's Endowment Fund and Operating Fund paid by the State shall be credited to a non-interest-bearing account held in the name of the Foundation with the State Treasury". Non-interest bearing account no. 25084 was therefore opened with the State Treasury.

This account is credited with the annual grant and the operation fee is transferred to a cashier's account with Banca Intesa as foreseen by Ministerial Decree MEF 49506 of 16th June 2010 and subsequent guidelines.

The balance at 31/12/2021 consists of the following amounts:

- €9,250,000 pursuant to Article 49-bis, Law Decree no. 34 of 19th May 2020, converted with amendments by Law no. 77 of 17th July 2020 for the establishment of the CITT;
- €30,763,999 from the portion of the 2018 grant collected during the current financial year.

CASH AND CASH EQUIVALENTS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
20,465,035	49,546,724	(29,081,689)

DESCRIPTION	VALUE AT START OF FY	VARIATIONS DURING THE FY	VALUE AT END OF FY
Bank and post office deposits	49,546,685	(29,082,369)	20,464,315
Cheques	-	-	-
Cash and other valuables on hand	39	680	719
TOTAL CASH AND CASH EQUIVALENTS	**49,546,724**	**(29,081,689)**	**20,465,035**

The balance represents cash and cash equivalents at the end of the financial year.

The item "Bank and post office deposits" at 31/12/2021, amounting to €20,464,315 , is composed as follows:

DESCRIPTION	AMOUNT
Banca Intesa account no. 162106	19,833,999
Banca Intesa account no. 176258	630,606
Transient bank	(290)
TOTAL	**20,464,315**

Banca Intesa account no. 162106 is the Foundation's treasury account while Banca Intesa account no. 176258 is the CITT account.

ACCRUED INCOME AND PREPAID EXPENSES

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
562,319	418,717	143,602

These items are income and expenses that are recognised in advance or in arrears with respect to the actual cash movement and/or event. They do not take into account the date of payment or collection of the income or expense, which are common to two or more periods and can be allocated over time. There were no accruals or deferrals with a duration of more than five years at 31/12/2021.

	ACCRUED INCOME	PREPAID EXPENSES	TOTAL ACCRUED INCOME AND PREPAID EXPENSES
Value at start of FY	-	418,717	418,717
Variation during the FY	-	143,602	143,602
VALUE AT END OF FY	**-**	**562,319**	**562,319**

This item is made up as follows:

DESCRIPTION	AMOUNT
IT support and maintenance	329,419
Maintenance and repair of science instruments	23,199
PhD student expenses	22,500
Equipment rental	8,162
Subscriptions to publications, newspapers and magazines	2,366
Other research support services	105,942
Administrative support services	18,956
Building maintenance services	13,004
Engineering and design services	578
Sundry insurance	309
Registration at scientific conferences and seminars	1,081
Advertising and staff recruitment	36,259
Current expenses for trademarks, logos and similar rights	544
TOTAL PREPAID EXPENSES	**562,319**

PART B - INFORMATION ON BALANCE SHEET LIABILITIES AND SHAREHOLDERS' EQUITY

SHAREHOLDERS' EQUITY

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
404,381,790	381,959,527	22,422,263

Variations in equity items:

	VALUE AT START OF YEAR	ALLOCATION OF THE PREVIOUS YEAR'S RESULT		OTHER VARIATIONS			OPERATING RESULT	YEAR-END VALUE
		ALLOCATION OF DIVIDENDS	OTHER USES	INCREASE	DECREASE	RECLASS.		
Endowment funds and reserves	77,261,869	-	-	-	-	-	-	77,261,869
HT Operating Fund	294,745,749	-	(48,742,375)	-	-	-	-	246,003,374
NP Operating Fund	-	-	69,569,748	-	-	-	-	69,569,748
CITT Operating Fund	9,909,225	-	1,577,143	-	-	-	-	11,486,368
Profit (loss) from the previous year	28,766	-	13,918	-	-	-	-	42,684
Profit (loss) for the year	13,918	-	(13,918)	-	-	-	17,747	17,747
TOTAL NET ASSETS	**381,959,527**	**-**	**22,404,516**	**-**	**-**	**-**	**17,747**	**404,381,790**

As established by Article 1, paragraph 119 of Law no. 232 of 11th December 2016, the Foundation's assets are made up of grants from the Founding Ministries and increased by further grants from the State, as well as funding from public and private entities.

The Endowment Fund is made up of restricted funding for the start-up of Human Technopole, provided for by Article 5 of Law Decree no. 185 of 25th November 2015, converted, with amendments, into Law no. 9 of 22nd January 2016 and initially allocated to the Fondazione Istituto Italiano di Tecnologia (Italian Institute of Technology Foundation) for the original amount of €79,900,000 and transferred, in the form of financial resources and assets in kind, to the Human Technopole Foundation, for the residual sum of €77,230,557, corresponding to the original amount net of charges incurred by the IIT. Pursuant to Article 6, paragraph 4, of the Human Technopole Foundation's By-Laws and Article 3 of the Foundation's Regulation, contained in the Prime Ministerial Decree of 27th February 2018, the aforementioned endowment fund is unavailable and restricted to the pursuit of the Foundation's statutory purposes.

The Operating Fund, at the closing date of the 2021 financial year, was booked under the Foundation's net equity for a total of €327,059,490 and included the grants indicated in Article 1, paragraph 121 of Law no. 232 of 11th December 2016, relating to the years 2019, 2020 and 2021, for the portion not used at the close of the year and the portion to be used of the funds granted for the "Centre for Innovation and Technology Transfer in Life Sciences".

This fund is composed of three items:
- HT Operating Fund amounting to €246,003,374;
- NP Operating Fund amounting to €69,569,748;
- CITT Operating Fund of €11,486,368.

The following table shows the changes in the Operating Fund divided between the HT share and the National Platforms share for a total €315,573,122:

PERIOD	GRANTS UNDER L. 232/2016.	GRANTS USED				GRANTS TO BE USED	OF WHICH	
		ES 2018	ES 2019	ES 2020	ES 2021		HT	NP
2017	10,000,000	275,387	5,070,516	4,654,097	-	-	-	-
2018	114,300,000	-	-	68,154,251	46,145,749	-	-	-
2019	136,500,000	-	-	-	2,596,626	133,903,374	133,903,374	-
2020	112,100,000	-	-	-	-	112,100,000	112,100,000	-
2021	122,100,000	-	-	-	52,530,252	69,569,748	-	69,569,748
TOTAL	**495,000,000**	**275,387**	**5,070,516**	**72,808,348**	**101,272,627**	**315,573,122**	**246,003,374**	**69,569,748**

The following table shows the changes in the CITT Operating Fund:

PERIOD	GRANTS - ARTICLE 49-BIS OF LD 34/2020 (CONVERTED INTO LAW 77/2020)	GRANTS USED				GRANTS TO BE USED
		ES 2018	ES 2019	ES 2020	ES 2021	
2020	10,000,000	-	-	90,775	422,857	9,486,368
2021	2,000,000	-	-	-	-	2,000,000
TOTAL	**12,000,000**	**-**	**-**	**90,775**	**422,857**	**11,486,368**

As highlighted in the introduction to the Notes to the Financial Statements, the "CITT Operating Fund" was granted under Article 49-bis of Law Decree no. 34 of 19th May 2020, converted with amendments into Law no. 77 of 17th July 2020, which provided for the establishment of the "Centre for Innovation and Technology Transfer in Life Sciences", specifying that HT Foundation must take specific measures and adopt dedicated solutions, including separate accounting for the use of the resources allocated for this purpose.

The grant for the Centre for Innovation and Technology Transfer for 2020 was €10,000,000, for 2021 it was €2,000,000, and following its use it amounts to €11,486,368 at 31st December 2021.

SEVERANCE PAY

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
564,922	220,938	343,984

	SEVERANCE PAY
Value at start of FY	220,938
Variations during the FY	-
Provision during the year	343,984
Use during the year	-
Other variations	-
Total variations	343,984
VALUE AT END OF FY	**564,922**

The fund represents the Foundation's effective liability in respect of the employees at 31/12/2021.

PAYABLES

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
20,652,547	9,814,189	10,838,358

VARIATIONS AND MATURITY OF LIABILITIES

Liabilities are broken down by maturity as follows:

	VALUE AT START OF FY	VARIATION DURING THE FY	VALUE AT END OF FY	PORTION DUE WITHIN FY	PORTION DUE BEYOND FY	OF WHICH WITH A RESIDUAL MATURITY OF MORE THAN 5 YEARS
Payables to banks	60	(60)	-	-	-	-
Payables to suppliers	9,064,879	9,742,183	18,807,062	18,807,062	-	-
Tax liabilities	302,553	421,844	724,397	724,397	-	-
Payables to social security institutions	286,964	345,329	632,292	632,292	-	-
Other payables	159,733	329,063	488,796	488,796	-	-
TOTAL PAYABLES	**9,814,189**	**10,838,358**	**20,652,547**	**20,652,547**	**-**	**-**

"Payables to suppliers" are booked at nominal value and, in addition to the amounts due for invoices received, also include the value of invoices for services rendered and orders delivered, not yet received by the closing of the financial year.

The item "Payables to suppliers" at 31/12/2021 is composed as follows:

DESCRIPTION	AMOUNT
Suppliers of goods and services	11,246,527
Invoices to be received	7,560,535
TOTAL	**18,807,062**

The increase in the item "Payables to suppliers" compared to the previous year is mainly due to a rise in obligations to counterparties.
The item "Tax liabilities" only includes certain and definite liabilities.

The item includes IRAP liabilities for €126,266, net of advances of €130,493 paid during the year. IRES liabilities of €205,206, net of advance payments of €80,574, are also recognised.

The item "Tax liabilities" at 31/12/2021 is made up as follows:

DESCRIPTION	AMOUNT
IRAP	126,266
IRES	205,206
Liabilities for withholding tax on employee income	211,163
Liabilities for withholding tax on self-employed income	14,674
Other tax liabilities	167,089
TOTAL	**724,397**

"Payables to social security institutions" include employee and contractor social security contributions accrued and unpaid at 31st December 2021.

A breakdown of these liabilities is provided below:

DESCRIPTION	AMOUNT
Due to INPS	596,669
Due to INAIL	30,215
Due to PREVINDAI for employees	2,500
Due to FASCHIM for employees	72
Payables to other social security institutions	2,836
PAYABLES TO OTHER SOCIAL SECURITY INSTITUTIONS	**632,292**

"Other payables", amounting to €488,796, comprise residual liabilities, which by their nature do not fall under the previous items, including payables due to the Foundation's staff. In particular, the payables related to employees' accrued but untaken leave is €452,720. Note that the increase in the balance for 2021 is due to increased hiring during the year.

BREAKDOWN OF LIABILITIES BY GEOGRAPHICAL AREA

The breakdown of liabilities at 31/12/2021 by geographical area is shown in the table below:

GEOGRAPHICAL AREA	BONDS	CONVERTIBLE BONDS	PAYABLES TO PARTNERS FOR FINANCING	PAYABLES TO BANKS	PAYABLES TO OTHER LENDERS	ADVANCES	PAYABLES TO SUPPLIERS	NOTES PAYABLE
Italy	-	-	-	-	-	-	18,196,371	-
EU	-	-	-	-	-	-	509,551	-
Extra EU	-	-	-	-	-	-	101,140	-
TOTAL	**-**	**-**	**-**	**-**	**-**	**-**	**18,807,062**	**-**

GEOGRAPHICAL AREA	PAYABLE TO COMPANIES SUBJECT TO PARENTAL CONTROL	TAX LIABILITIES	PAYABLES TO SOCIAL SECURITY INSTITUTIONS	OTHER PAYABLES	PAYABLES
Italy	-	724,397	632,292	488,796	1,845,485
TOTAL	**-**	**724,397**	**632,292**	**488,796**	**1,845,485**

ACCRUALS AND DEFERRED INCOME

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
126,585,603	60,761,347	65,824,257

	ACCRUED EXPENSES	DEFERRED INCOME	TOTAL ACCRUALS AND DEFERRED INCOME
Value at start of FY	-	60,761,347	60,761,347
Variation during the FY	-	65,824,257	65,824,257
VALUE AT END OF FY	**-**	**126,585,603**	**126,585,603**

This item is made up as follows:

DESCRIPTION	AMOUNT
Deferred income	10,776,379
Deferred income grants for equipment	115,809,224
TOTAL	**126,585,603**

The valuation and conversion criteria for values expressed in foreign currency are described in the first part of these notes.

In accordance with the indirect method governed by OIC 16, deferred income includes that portion of the capital grant (treated as prepaid income to be deferred), which essentially relates to depreciable assets acquired during the year, amounting to €126,585,603.

PART C - INFORMATION ON THE INCOME STATEMENT

VALUE OF PRODUCTION

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
36,220,072	12,372,887	23,847,185

DESCRIPTION	31/12/2021	31/12/2020	VARIATIONS
Income from sales and services	-	-	-
Other revenues and income	36,220,072	12,372,887	23,847,185
TOTAL	**36,220,072**	**12,372,887**	**23,847,185**

The item "Other revenues and income" is made up as follows:

- Operating Grant - HT pursuant to Article 1, paragraph 121 of Law no. 232/2016: amounting to €18,033,953, that portion of the Operating Grant related in accrual terms to the activities of the Foundation on account of the costs incurred (as provided by accounting principle no. 1 for non-profit entities);
- Operating Grant - CITT ex Art. 49-bis D.L. 34/2020, converted with amendments by L. 77/2020: amounting to €422,857, that portion of the operating grant linked to financing the "Centre for Innovation and Technology Transfer in Life Sciences". The total amount of the grant by law is €2,000,000: the amount included in "Other revenues and income" is the portion pertaining to the financial year ended 31st December 2021;
- Capital Grant - HT: amounting to €6,070,601, this is the capital grant for the year, calculated on the basis of the depreciation posted to the income statement and determined on the basis of the useful life of the assets purchased during the year and in previous years. Capital grants are recognised using the "income method", whereby the amount is posted to the income statement under "Other revenues and income", and booked to future years under deferred income, with depreciation posted to the income statement on the gross cost of assets equal to the portion of the grant attributable to the year;
- Operating Grant - National Platforms: amounting to €11,581,829, that portion of the operating grant related in accrual terms to the Foundation's activities for the National Platforms on account of the costs incurred (as provided by accounting principle no. 1 for non-profit entities);
- Operating Grant - Other Bodies: amounting to €61,469, that portion of operating grant paid by entities other than the MEF for specific scientific research projects;
- Sundry revenues and income: amounting to €49,363, this item refers to revenues from the Foundation's commercial activities, consisting of renting out spaces in Palazzo Italia, as well as a share of the revenues from a scientific project financed by the Sanger Institute.

OPERATING COSTS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
35,660,571	12,187,935	23,472,636

DESCRIPTION	31/12/2021	31/12/2020	VARIATIONS
Raw and ancillary materials and goods	2,596,936	889,440	1,707,496
Services	14,719,853	6,252,890	8,466,962
Use of third party assets	1,640,201	164,767	1,475,434
Wages and salaries	7,808,324	3,016,694	4,791,630
Welfare costs	2,029,381	920,692	1,108,689
Severance pay	496,983	195,321	301,662
Severance payments and similar	63,499	21,302	42,196
Other costs	182,084	-	182,084
Amortisation of intangible assets	11,906	9,847	2,059
Depreciation of tangible assets	6,058,695	713,661	5,345,034
Other write-downs of fixed assets	-	-	-
Variations in stock of raw, ancillary and consumable materials and goods	(73,696)	-	(73,696)
Sundry operating costs	126,407	3,321	123,086
TOTAL	**35,660,571**	**12,187,935**	**23,472,636**

COST OF RAW MATERIALS, CONSUMABLES AND GOODS AND COST OF SERVICES

The cost of consumables is directly related to HT Foundation research activities and the structural costs incurred.

Costs for services, amounting to €14,719,853 are made up of the following:

COSTS OF SERVICES	ACTUAL 31.12.2021
EURO	AMOUNT
Technical, administrative and legal advice	1,604,982
Software support and maintenance	3,683,343
Insurance	375,830
Staff pay	300,460
Board and committee fees	849,787
Maintenance and repairs	1,864,109
Other research support services	1,088,872
Training	123,778
Communication and publications	648,296
PhD student expenses	529,272
Other service costs	2,867,691
Staff recruitment and advertising	264,286
Organisational and management support	519,148
TOTAL	**14,719,853**

PERSONNEL COSTS

This item includes all employee expenses including bonuses, promotion, contingency payments, untaken holidays and provisions required by law and collective agreements.

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
10,580,270	4,154,009	6,426,261

The change reflects the increase in the number of employees during the year.

DEPRECIATION/AMORTISATION OF TANGIBLE/INTANGIBLE ASSETS

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
6,070,601	723,508	5,347,093

Depreciation is calculated on the basis of the useful life of the asset and its use in production.

SUNDRY OPERATING COSTS

The increase in "Sundry operating costs" is due to IMU and TARI taxes paid directly by HT Foundation, following the purchase of Palazzo Italia.

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
126,407	3,321	123,086

FINANCIAL INCOME AND CHARGES

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
785	(2,028)	2,813

DESCRIPTION	31/12/2021	31/12/2020	VARIATIONS
Income other than the above	1,968	570	1,398
(Interest and other financial charges)	(112)	(161)	50
Foreign exchange gains/losses	(1,072)	(2,437)	1,365
TOTAL	**785**	**(2,028)**	**2,813**

INCOME TAXES FOR THE YEAR, CURRENT, DEFERRED AND PREPAID

BALANCE AT 31/12/2021	BALANCE AT 31/12/2020	VARIATIONS
542,538	169,006	373,532

DESCRIPTION	31/12/2021	31/12/2020	VARIATIONS
Current income taxes	**542,538**	**169,006**	**373,532**
IRES	285,780	80,574	205,206
IRAP	256,759	88,432	168,327
Deferred (prepaid) taxes	**-**	**-**	**-**
IRES	-	-	-
IRAP	-	-	-
TOTAL	**542,538**	**169,006**	**373,532**

Taxes pertaining to the year were booked. Pursuant to Article 2427, paragraph 1, no. 14, of the Italian Civil Code, there were no temporary differences found for deferred taxation purposes.

CALCULATION OF IRES

INSTITUTIONAL ACTIVITY	FY 31/12/2021
Income from buildings	268,317
IRES rate	24%
IRES Institutional activity	**64,396**

COMMERCIAL ACTIVITY	FY 31/12/2021
A) Value of production	1,032,761
5) Other revenues and income	1,032,761
B) Costs of production	(110,330)
7) Costs of services (mixed costs)	(90,644)
9) Personnel costs (mixed costs)	(11,919)
10) Depreciation and amortisation (mixed costs)	-
Land rent	(7,767)
Increase	-
Corporate income	922,431
IRES rate	24%
IRES Commercial activity	**221,383**

IRES TOTAL	FY 31/12/2021
IRES Institutional activity	64,396
IRES Commercial activity	221,383
IRES for the year	**285,779**

CALCULATION OF IRAP

INSTITUTIONAL ACTIVITY	FY 31/12/2021
Personnel and staff costs	-
Gross taxable income	8,020,647
Deductions	(2,379,207)
Net taxable income	5,641,440
IRAP rate	3.9%
IRAP institutional activity	**220,016**

COMMERCIAL ACTIVITY	FY 31/12/2020
A) Value of production	1,032,761
B) Costs of production	(90,644)
IRAP recoveries	-
Taxable IRAP	942,117
IRAP rate	3.9%
IRAP commercial activity	**36,743**

IRAP TOTAL	FY 31/12/2021
IRAP institutional activity	220,016
IRAP commercial activity	36,743
IRAP for the year	**256,759**

IRAP was calculated on the basis of the rules for non-commercial entities. Meanwhile IRES was calculated on the basis that the cadastral income from properties owned by HT Foundation contributes to the formation of net profit, without deduction of costs or other charges.

PART D - OTHER INFORMATION

Introduction, notes and other information

EMPLOYMENT DATA

Reference should be made in full to the Management Report. The composition of the workforce at 31/12/2021 is shown below. Staff were recruited through advertising on the Foundation's website and on major international recruitment sites (Linkedin, Springer Nature, Eurojobsites).

The average number of employees, broken down by category, changed as follows compared to the previous year.

WORKFORCE	31/12/2021	31/12/2020	VARIATIONS
Executives	31	21	10
Middle management	40	17	23
Clerical staff	88	32	56
Workers	-	-	-
Others	-	-	-
TOTAL	**159**	**70**	**89**

Labour relations were managed, as regards pay and conditions, with reference to two National Collective Bargaining Agreements (hereinafter referred to as CCNLs): (i) for employees with managerial qualifications, the CCNL DIRIGENTI INDUSTRIA; (ii) for other staff, the CCNL CHIMICA-AZIENDE INDUSTRIALI.

	EXECUTIVES	MIDDLE MANAGEMENT	CLERICAL STAFF	OTHER EMPLOYEES	TOTAL WORKFORCE
Average	26.3	28.26	60.78	-	**115.34**

REMUNERATION, ADVANCES AND CREDITS GRANTED TO DIRECTORS AND AUDITORS AND COMMITMENTS UNDERTAKEN ON THEIR BEHALF

	CONSIGLIO DI SORVEGLIANZA	MANAGEMENT COMMITTEE	BOARD OF AUDITORS
Remuneration	394,784	120,000	38,302
Advances	-	-	-
Credits	-	-	-
Commitments made on their behalf under guarantees given	-	-	-

COMMITMENTS, GUARANTEES AND CONTINGENT LIABILITIES NOT SHOWN IN THE BALANCE SHEET

2021 saw the formalisation of numerous commitments that will be completed over the next few years, for a total €67,776,642, including:

- €1,671,744 for the continued development of the SAP platform
- €9,052,022 for the 2021 quota of the Moli-sani and Troina science projects
- €4,699,937 for activities related to the South Building project
- €26,737,654 for scientific equipment
- €1,919,608 for laboratory equipment
- €8,570,975 for improvements to the Campus and existing buildings
- €3,883,730 for Data Centre and IT equipment
- €1,000,000 for ECF
- €362,946 for scientific journals
- €4,476,463 for scientific services
- €722,543 for services for the Campus and existing buildings
- €3,050,183 for Data Centre and IT services
- €1,628,837 for other services and materials

In addition, bank guarantees were obtained for a total €21,250, composed as follows:

AMOUNT	BENEFICIARY	EXPIRY
€21,250	Immobiliare Mozart sas	31.12.2022

The guarantee of €500,000, granted in favour of Arexpo Spa, and held in a bank account with IntesaSanPaolo spa was fully settled during the year.

INFORMATION ON RELATED PARTY TRANSACTIONS

The entity has not entered into any related party transactions.

INFORMATION ON AGREEMENTS NOT SHOWN ON THE BALANCE SHEET

Reference should be made to the Management Report and to the previous point on commitments not shown on the balance sheet.

SIGNIFICANT EVENTS FOLLOWING THE END OF THE PERIOD

Finally, in relation to the economic and financial targets for 2022, the potential consequences of Russian's recent invasion of Ukraine should be highlighted. In particular, the targets set by the Foundation could be subject to partial review as a result of the inflationary effects on energy costs and prices of supplies more generally.

INFORMATION ON DERIVATIVE FINANCIAL INSTRUMENTS PURSUANT TO ARTICLE 2427-BIS OF THE ITALIAN CIVIL CODE

The Foundation holds no derivative financial instruments.

INFORMATION PURSUANT TO ARTICLE 1, PARAGRAPH 125-BIS OF LAW NO. 124 OF 4th AUGUST 2017

Pursuant to Article 1, paragraph 125, of Law no. 124 of 4th August 2017, in compliance with the obligation of transparency, it should be noted that grants were received during the year for the following amounts:

- €7,818,663 in residual contributions for the year 2018;
- €30,763,999 in residual contributions for the year 2018;
- €17,978,376 in residual contributions for the year 2018.

Lastly, it should be noted that during the year the Foundation accrued grants which have not yet been materially received, amounting to €374,088,591, relating to the years 2019, 2020 and 2021.

OTHER INFORMATION

The table below summarises the income statement for HT Foundation's commercial activity:

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
A) VALUE OF PRODUCTION	**37,077**	**13,918**
1) Revenues from sales and services	**-**	**-**
2) Change in stock of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on order	**-**	**-**
4) Increase in fixed assets for internal work	**-**	**-**
5) Other revenues and income	**37,077**	**13,918**
a) Other	37,077	13,918
b) HT grants:	-	-
of which HT Operating grants	-	-
of which HT Capital grants	-	-
c) CITT grants	-	-
of which CITT Capital grants	-	-
of which CITT Operating grants	-	-
d) National Platforms grants	-	-
e) Grants from other bodies	-	-
of which Capital grants other bodies	-	-
of which Operating grants other bodies	-	-
B) COSTS OF PRODUCTION	**995,684**	**230,293**
6) Raw materials, consumables and goods	**136,697**	**-**
7) Services	**459,105**	**90,261**
8) Lease / rent	**-**	**-**
9) Personnel costs	**52,230**	**20,524**
a) Salaries and wages	47,422	15,367
b) Social contributions	4,150	3,915
c) Severance pay	659	987
d) Pensions and similar benefits	-	254
e) Other costs	-	-
10) Depreciation and write-downs	**239,016**	**119,508**
a) Amortisation of intangible fixed assets	-	-
b) Depreciation of tangible fixed assets	239,016	119,508
c) Other write-downs of fixed assets	-	-
d) Impairment of receivables in current and liquid assets	-	-
11) Changes in stock of raw, ancillary and consumable materials and goods	**-**	**-**
14) Other operating costs	**108,637**	**-**
Difference between Value and Cost of Production	**(958,608)**	**(216,375)**
C) FINANCIAL INCOME AND COSTS	**-**	**-**
16) Other financial income	**-**	**-**
17) Interest and other financial charges	**-**	**-**
17-bis) Exchange gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS ON FINANCIAL ASSETS	**-**	**-**
Profit before tax	**(958,608)**	**(216,375)**
20) Income tax for the year	**258,126**	**62,557**
a) Current taxes	258,126	62,557
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expenses) from adoption of tax consolidation/tax transparency regime	-	-
21) Profit (loss) for the year	**(1,216,734)**	**(278,932)**

Article 49-bis, paragraph 3 of Law Decree no. 34 of 19th May 2020, converted with amendments by Law no. 77 of 17th July 2020, in relation to development of the "Centre for Innovation and Technology Transfer in Life Sciences", specifies that: "The Human Technopole Foundation shall take specific measures and adopt dedicated solutions, including separate accounting for the use of the resources allocated for this purpose."

The table below summarises the income statement for the start-up of CITT:

INCOME STATEMENT (IN EURO)	31/12/2021	31/12/2020
A) VALUE OF PRODUCTION	**422,857**	**90,775**
1) Revenues from sales and services	**-**	**-**
2) Change in stock of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on order	**-**	**-**
4) Increase in fixed assets for internal work	**-**	**-**
5) Other revenues and income:	**422,857**	**90,775**
a) Other	-	-
b) HT grants:	-	-
of which HT Operating grants	-	-
of which HT Capital grants	-	-
c) CITT grants	422,857	90,775
of which CITT Capital grants	-	-
of which CITT Operating grants	422,857	90,775
d) National Platforms grants	-	-
e) Grants from other bodies	-	-
of which Capital grants other bodies	-	-
of which Operating grants other bodies	-	-
B) COSTS OF PRODUCTION	**422,857**	**90,775**
6) Raw materials, consumables and goods	**-**	**-**
7) Services	**386,115**	**59,553**
8) Lease / rent	**-**	**-**
9) Personnel costs	**36,742**	**31,222**
a) Salaries and wages	36,742	23,698
b) Social contributions	-	5,929
c) Severance pay	-	1,222
d) Pensions and similar benefits	-	373
e) Other costs	-	-
10) Depreciation and write-downs	**-**	**-**
a) Amortisation of intangible fixed assets	-	-
b) Depreciation of tangible fixed assets	-	-
c) Other write-downs of fixed assets	-	-
d) Impairment of receivables in current and liquid assets	-	-
11) Changes in stock of raw, ancillary and consumable materials and goods	**-**	**-**
14) Other operating costs	**-**	**-**
Difference between Value and Cost of Production	**-**	**-**
C) FINANCIAL INCOME AND COSTS	**-**	**-**
16) Other financial income	**-**	**-**
17) Interest and other financial charges	**-**	**-**
17-bis) Exchange gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS ON FINANCIAL ASSETS	**-**	**-**
Profit before tax	**-**	**-**
20) Income tax for the year	**-**	**-**
a) Current taxes	-	-
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expenses) from adoption of tax consolidation/tax transparency regime	-	-
21) Profit (loss) for the year	**-**	**-**

These financial statements, consisting of Balance Sheet, Income Statement, Notes to the Financial Statements and Cash Flow Statement, give a truthful and accurate representation of the financial and equity position and net profits of the financial year and correspond to the accounting records.

4.3 Auditors' Report on the Integrated Report

Fondazione Human Technopole

Independent auditors' report on the
"Integrated Report 2021"

This report has been translated into English from the original, which was prepared in Italian and represents the only authentic copy, solely for the convenience of international readers.

AMN/FMG/git - RC118222021BD4107

BDO

Tel: +39 02 58.20.10
www.bdo.it

Viale Abruzzi, 94
20131 Milano

Independent auditors' report on the Integrated Report

To the Management Committee of
Fondazione Human Technopole

We have been engaged to perform a limited assurance engagement on the Integrated Report of Fondazione Human Technopole (the "Foundation") for the year ended on December 31st, 2021 and approved by the Management Committee on September 7st, 2022.

Directors' responsibility on the Integrated Report

The Directors of Fondazione Human Technopole are responsible for the preparation of the Integrated Report in accordance with the "GRI Sustainability Reporting Standards (GRI Standards)" issued in 2016 by the GRI - Global Reporting Initiative, as described in the paragraph "Methodology" of the Integrated Report.

The Directors are responsible for that part of the internal control that they consider necessary in order to enable the preparation of a Integrated Report that is free from material misstatements, whether due to frauds or unintentional behaviors or events.

The Directors are also responsible for the definition of the objectives regarding the sustainability performance and the reporting of the achieved results, as well as for the identification of the stakeholders and the significant matters to report.

Auditors' independence and quality control

We are independent in accordance with the ethics and independence principles of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, based on fundamental principles of integrity, objectivity, professional competence and diligence, confidentiality and professional behavior.

Our audit firm applies the International Standards on Quality Control 1 (ISQC Italia 1) and, consequently, maintains a quality control system that includes documented policies and procedures, regarding compliance with ethical requirements, professional standards and applicable laws and regulations.

Auditors' responsibility

It is our responsibility to express, on the basis of the procedures performed, a conclusion about the compliance of the Integrated Report with the requirements of the GRI Standards. We conducted our work in accordance with the principles included in the "International Standard on Assurance Engagements 3000 (Revised)- Assurance Engagements other than Audits or Reviews of Historical Financial Information" ("ISAE 3000 Revised"), issued by the International Auditing and Assurance Standards Board (IAASB) for limited assurance engagements. This standard requires the planning and execution of procedures in order to obtain limited assurance that the Integrated Report is free from material misstatement.

Therefore, the extent of work performed in our examination was lower than that required for a full examination in accordance with ISAE 3000 Revised ("reasonable assurance engagement") and, hence, it does not provide assurance that we have become aware of all significant matters and events that would have been identified during a reasonable assurance engagement.

The procedures performed on the Integrated Report were based on our professional judgement and included inquiries, primarily with company's personnel responsible for the preparation of the information included in the Integrated Report, document analysis, recalculations and other procedures in order to obtain evidences considered appropriate.

In particular, we have performed the following procedures:

- Analysis of the process relating to the definition of material aspects included in the Integrated Report, with reference to the criteria applied to identify priorities for the different stakeholder categories and to the internal validation of the process results;
- comparison of economic and financial data included in the Integrated Report with those included in the Financial Statements of the Foundation;
- analysis of processes that support the generation, collection and management of data and information to the department responsible for the preparation of the Integrated Report. In particular, we have performed interviews and discussions with the management of Fondazione Human Technopole to gather information about the accounting and reporting systems used in preparing the Integrated Report, as well as on the internal control procedures supporting the gathering, aggregation, processing and transmission of data and information to the department responsible for the preparation of the Integrated Report;

furthermore, for the most important information, taken into consideration the activities and the characteristics of the Foundation:

- with reference to the qualitative information contained in the Integrated Report, we carried out interviews and we have acquired supporting documentation to verify their consistency with the available evidence;
- with reference to quantitative information, we carried out both analytical procedures and limited checks to ascertain the correct aggregation of data on a sample basis.

Conclusion

Based on the work performed, nothing has come to our attention that causes us to believe that the Integrated Report of Fondazione Human Technopole for the period ended on December 31st, 2021 is not prepared, in all material respects, in accordance with the "GRI Sustainability Reporting Standards (GRI Standards)" issued in 2016 by the GRI - Global Reporting Initiative, as stated in the paragraph "Methodology" of the Integrated Report.

Milan, September 7th, 2022

BDO Italia S.p.A.

Signed by
Andrea Meneghel
Partner

HUMAN TECHNOPOLE
VIALE RITA LEVI-MONTALCINI, 1
AREA MIND – CARGO 6
20157 MILAN ITALIA

TEAM RISK MANAGEMENT & INTEGRATED REPORT
FINANCE DEPARTMENT

GRAPHIC PROJECT
VISUALMADE, MILAN

IMAGES
HUMAN TECHNOPOLE ARCHIVE

FOR COMMENTS, REQUESTS, OPINIONS AND IDEAS FOR IMPROVEMENT REGARDING HT SUSTAINABILITY ACTIVITIES AND THE INFORMATION CONTAINED HEREIN, PLEASE CONTACT THE HT FINANCE TEAM BY SENDING AN E-MAIL TO THE FOLLOWING ADDRESS: **HT-DEPT-FINANCE@FHT.ORG**

www.humantechnopole.it