

ORIGINS AND THE FIRST THREE YEARS



President

- Marco Simoni

Director

- Iain Mattaj

Supervisory Board

- Marco Simoni, President, Human Technopole
- Giovanna Iannantuoni, Rector, Milano Bicocca University
- Massimo Inguscio, Full Professor of Physics, University Campus Bio-Medico, Rome
- Marco Mancini, Pro-Rector for Organisational Autonomy, Administrative Innovation and Resource Planning and Professor of Glottology and Linguistics, La Sapienza University, Rome
- Mauro Marè, Professor of Public Economics, Luiss University, Rome
- Biagio Mazzotta, Ragioniere Generale dello Stato
- Marcella Panucci, Chief of Staff, Ministry for Public Administration
- Maria Grazia Roncarolo, Director of the Centre for Definitive and Curative Medicine and Professor of Paediatrics and Medicine, Stanford University, USA
- Donatella Sciuto, Executive Deputy Rector, Politecnico di Milano
- Roberta Siliquini, Professor Department of Public Health and Paediatric Sciences, University of Turin
- Gianluca Vago, President, CNAO Foundation, Pavia
- Alessandro Vespignani, Professor of Physics, Northeastern University and Founding Director, Northeastern Network Science Institute, Boston, USA

Management Committee

- Iain Mattaj, Director, Human Technopole
- Irene Bozzoni, Professor of Molecular Biology, La Sapienza University, Rome
- Nando Minnella, Director General, National Institute of Nuclear Physics, Rome
- Stefano Piccolo, Professor of Molecular Biology, University of Padua
- Fabio Terragni, Founding Partner and Chairman, Alchemia Srl, Milan

Scientific Committee

- Geneviève Almouzni, Research Director, Centre National de la Recherche Scientifique - Institut Curie, France
- Andrea Ballabio, Director, Telethon Institute of Genetics and Medicine (TIGEM), Italy
- Pietro De Camilli, Director, Programme in Cellular Neuroscience, Neurodegeneration and Repair (CNNR), Yale School of Medicine, USA
- Kristian Helin, Chief Executive and President, The Institute of Cancer Research, UK
- Alberto Mantovani, Scientific Director, Humanitas Clinical Institute, Italy
- Margaret McMahon, Global Head Data Science, Roche Information Solutions Data & Analytics, Switzerland
- Gennaro Melino, Professor of Biochemistry and Director Oncoscience Research Centre, Tor Vergata University, Italy
- Luca Pani, Professor of Clinical Psychiatry, University of Miami and Professor of Pharmacology and Clinical Pharmacology, University of Modena and Reggio Emilia, Italy
- Alfio Quarteroni, Professor and MOX Director, Laboratory of Modelling and Scientific Computing, Politecnico di Milano, Italy
- Walter Ricciardi, Professor of Hygiene and Public Health, Università Cattolica del Sacro Cuore, Italy
- Nadia Rosenthal, Scientific Director, The Jackson Laboratory, USA
- Michael Snyder, Director, Center for Genomics and Personalised Medicine, Stanford University School of Medicine, USA
- Giulio Superti-Furga, Scientific Director, Research Center for Molecular Medicine (CeMM), Austria
- Fiona Watt, Director, European Molecular Biology Organisation, Germany

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EXECUTIVE SUMMARY

On 31 October 2015, the **Universal Exhibition** closed in **Milan**. For six months, the city had been the site of an extraordinary event that, in an area of more than one million square metres, with the involvement of more than 140 countries and international organisations, had welcomed over **21 million people** from all around the world around the theme 'Feeding the Planet, Energy for Life'.

An event that showed how by teaming up, Italy and Italians, public and private sector, institutions and civil society, exceptional results can be achieved.

This enormous heritage of values, collaboration, energy, consensus, but also of sustainability and respect for human health and the planet's balance, was to become the legacy of the area and its new horizon.

The choice was to **transform the area into a new centre of research, knowledge and innovation** within a large urban park, a district that will see a community of scientists, doctors, students and new inhabitants.

At the heart of this innovation district will be **Human Technopole**, the new life sciences research institute. Its mission will be to improve people's health and well-being, conduct frontier research aimed at developing new approaches to personalised and preventive medicine, and disseminate scientific culture. It will be an open place, equipped with state-of-the-art technological platforms, capable of engaging the national scientific community and attracting investment. It will also attract top talent from around the world and encourage the return of Italian scientists.

Work began on this ambitious project immediately. The 'Human Technopole' **project**, written by a team of scientists from dozens of Italian scientific institutions coordinated by the Italian Institute of Technology, was **approved by a decree of the Prime Minister** in September 2016.

The Project Structure and the Coordination Committee, defined by the Prime Minister's Decree, were entrusted with the task of guiding and supervising the initial phase up to the establishment of the Foundation over the next two years, approving the plan for the Human Technopole campus and launching the **search procedure for the Institute's first Director**.

With international selection rules, from the 46 candidates identified, half of them foreigners testifying to the project's perceived relevance beyond national borders, an international commission chaired by Nobel Prize winner for Chemistry Martin Chalfie chose **Prof. Iain Mattaj**. A Scottish biochemist, Mattaj was at the time, for over ten years, Director of the prestigious European Molecular Biology Laboratory in Heidelberg.

Timeline

2015

October/
End of EXPO
Milano 2015

2016

September/
HT project
approval

In the meantime, **renovation work** began on **Palazzo Italia**, the magnificent Italian pavilion at the Expo, which was completely re-functionalised to become the institutional headquarters of Human Technopole, housing its administrative offices and computational laboratories.

Having approved the Foundation's Statute in March 2018, the Presidency of the Council of Ministers appointed the first seven members of the Supervisory Board in May, including President **Prof. Marco Simoni**.

The following month, at its first meeting, the Board officially appoints Prof. Iain Mattaj as the first Director of Human Technopole. Once the Management Committee, appointed by the Supervisory Board in October of the same year, is also established, **the dual governance of Human Technopole is completed**.

	2019	TODAY
OFFICES AND LABORATORIES	500 sqm	20.000 sqm
PEOPLE	13	250

Through a rigorous selection process, based on strict merit-based criteria and international committees, all the **Head of Research Centres** are chosen. **Seven Italian researchers** will lead the centres for genomics, neurogenomics, structural biology, computational biology and health data science. Coming from the world's most important research centres, for many of them, as for most of their teams, Human Technopole is their first work experience in Italy after years of career abroad.

The pandemic slowed down the arrival of some of them in Italy as well as part of the infrastructure construction, but Human Technopole's activities never stopped.

In April 2020, an international competition was awarded to design the **new building at the centre of the Human Technopole Campus**, the entire research area - of which the new building will be the core - whose construction will be completed in 2026. In addition to the laboratories and facilities envisaged by the Human Technopole Strategic Plan, the Campus will also house the National Platforms envisaged by the Convenzione signed in December 2020 with the founding Ministries.

Following Law No. 160/2019, implemented through the above-mentioned Convenzione, among Human Technopole's missions is also that of creating and managing technological services and infrastructures available to scientists outside the institute, to meet the needs of the scientific community in the life sciences sector. The **National Platforms** envisaged by the Convenzione and identified through consultations with the entire scientific community will be added to HT's facilities, to the benefit of all Italian research. The consultations are currently underway and the National Platforms will further boost life sciences in Italy.

2018

March/
Approval of HT
Statutes

May/

Appointment of
first board
members
including President
Marco Simoni

June/

CdS appoints
Iain Mattaj,
as first HT Director

2019

January/

Director Mattaj
takes office at
Palazzo Italia

October/

Appointment of
first Heads
of Research
Centres

2020

April/

Presentation
winning project
South Building

December/

Convenzione with
Founding
Ministries is
signed

Today Human Technopole covers 20,000 square metres of office and laboratory space and employs 250 people, including administrative staff, researchers, collaborators and PhD students. More than 60% of the scientific staff come from research institutes abroad and Human Technopole already counts 22 different nationalities.

In April 2021, the redevelopment of the North and South Pavilions of the Campus to house **the first laboratories** was completed, in May **five microscopes** were installed in the **Cryo-Electron Microscopy Facility**, and in July the installation of the first next-generation sequencing technologies in the Genomics Facility was completed. Our scientists have already published numerous articles in prestigious journals such as Nature, Nature Communications and Science, and three of them have even earned the covers of Science, Trends in Neuroscience and Molecular Cell.

The first edition of the **Early Career Fellowship Programme**, an initiative to support the professional development of deserving researchers by helping them to start their own independent research activities in Italy, ended in September 2021. Thanks to the programme, five young researchers won a fellowship, worth EUR 200,000 per year for five years, to develop their project in an Italian institute. These young scientists have brought their talent back to Italy and the new call for applications has already started to select the winners of the second edition. The year 2022 started with wonderful news: a research project focusing on the study of the functioning of the thyroid gland, proposed by Francesca Coscia, group leader of our Structural Biology centre, was awarded the **ERC Starting Grant**, one of the most important European research funds supporting young scientists at the beginning of their careers.

We have initiated discussions with the main business, financial and research players in the life sciences sector to promote and support innovation and progress through **technology transfer**.

Our mission to disseminate scientific culture is at the heart of all our activities in collaboration with universities and associations, but also in our initiatives for the general public. We have, for example, launched a series of events, '**HTpresents - Dialogues on Science and Society**', in which, taking an essay as a starting point, we reflect with the author on the challenges facing the world today and how scientific research can help us understand them better. We have created a social campaign, **#RememberMyName**, to tell the story of the discoveries and revolutionary ideas of lesser-known scientists, women and men who have played a key role in scientific progress but whose names are often unknown. Our Foundation has also promoted an action to intervene on the **toponymy** of the district to name streets after women and men of science, innovators and researchers, with a proposal, for the first time in Italy, that is mindful to gender balance. The first street to be renamed was the one on which Human Technopole opens, dedicated at our request to Rita Levi-Montalcini.

2021

April/
Works for first HT
laboratories
completed

May/
First five CryoEM
microscopes
installed

September/
Winners of the
first Early Career
Fellowship
Programme
announced

November/
First companies
arrive in MIND area
(Astrazeneca,
ROLD, Bio4
Dreams)

Meanwhile, all around us, the innovation district is growing. The **MIND - Milano Innovation District area**, whose urban reversion project is the result of an important public-private partnership between Arexpo, the company with a public majority that owns the area, and Lendlease, an Australian multinational, is becoming more populated. After the arrival of the **Galeazzi Hospital** and the **Science Campus of the Milan State University**, the presence of Human Technopole has fostered the attraction of more than 30 relevant companies in the life sciences sector that will settle in the district. Among the first are **Astrazeneca, Bio4Dreams, Rold and Illumina**.

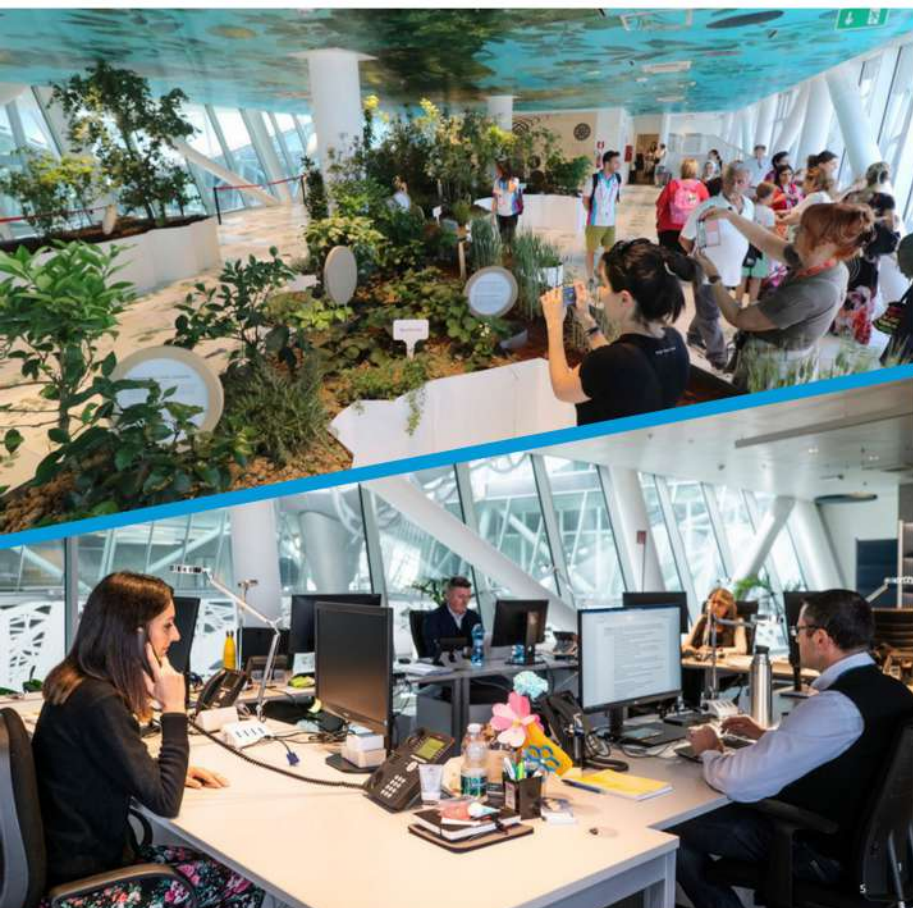
The challenge of the Expo 2015 legacy has thus been taken up and is in full realisation and expression. At the heart of this ambitious project, a large science and innovation park that seemed almost visionary, Human Technopole is a beating heart in continuous evolution. Tomorrow this document will already be outdated because we will have welcomed new scientists, built new spaces, launched other projects and initiatives.

We will continue to report and share
Human Technopole's new challenges and
achievements,
because science is a common good.



1/ THE HT PROJECT

In the aftermath of Expo Milano 2015, the Italian government and local institutions take action to implement a plan for the reconversion of the area, which is not only in line with the legacy of the Exposition, dedicated to the theme 'Feeding the Planet', but is also capable of enhancing the area in terms of sustainability, health and opportunities for young people.



The transformation of Palazzo Italia

2015

2019

The first financial resources made available by the State for the **development of the scientific project subsequently called "Human Technopole"**, are assigned to the Italian Institute of Technology (IIT) by decree-law 25/11/2015, converted by law 22/1/2016, no. 9, for the implementation of a scientific and research project in the area already used by EXPO S.p.a., requesting IIT to prepare an executive project for this purpose to be approved by DPCM.

The 'Human Technopole' project, written by a team of scientists coordinated by IIT and belonging to dozens of Italian scientific institutions, mainly operating in the Milan area, **was approved by DPCM on 16 September 2016**. With the same measure, IIT is given the task of guiding the initial phase pending the establishment of a special '**Project Structure**' with separate accounts, to which the above-mentioned resources will be allocated. This Structure is assisted by a special '**Coordination Committee**' in which, among others, the CNR, ISS, CRUI and Milan's public universities are represented, with the task of guiding and supervising the initial phase until the establishment of the Human Technopole Foundation in the following two years.

Under the guidance of these two bodies, the plan for the Human Technopole campus was first approved and the search procedure for the institute's first director began. A procedure to which particular attention had to be paid to ensure that the person selected was of undisputed quality and international standing, to guarantee the construction of the Human Technopole project itself.

From the 46 shortlisted candidates - half of them foreigners, testifying to the project's perceived relevance beyond national borders - and evaluated by an international commission chaired by Nobel Prize winner for Chemistry Martin Chalfie, **Prof. Iain Mattaj** was chosen. A Scottish biochemist, Mattaj was at the time, for more than ten years, Director of the European Molecular Biology Laboratory (EMBL), one of the world's leading research institutes for molecular biology, with three Nobel Prizes to his credit, including the most recent for chemistry in 2017.



Iain Mattaj

Degree in Biochemistry from the University of Edinburgh, PhD at the University of Leeds and Post Doc at the University of Basel.

His discoveries have contributed to advancing knowledge in the fields of transcription, metabolism and RNA transport. In particular, they revealed the key role of the enzyme RAN-GTPase in the regulation of cell division.

From 2005 to 2018, he was Director General of the European Molecular Biology Laboratory (EMBL). In 2021, he received the German Cross of Merit.

In the meantime, renovation works began at Palazzo Italia, the institutional headquarters of Human Technopole, which was converted from the Italian pavilion at Milan Expo 2015 to house the Institute's administrative offices and computational laboratories.

Following the approval in March 2018 of the Foundation's Statutes, similar to those of major international scientific institutions, the first members of the Supervisory Board were appointed in May 2018, including **President Prof. Marco Simoni**, whose first act was the official appointment of Prof. Iain Mattaj as the first Director of Human Technopole.

With the appointment, also by the Supervisory Board, of the remaining four members of the Management Committee, a body chaired by the Director, **the first core of Human Technopole's Governance is completed.**



Marco Simoni

President Human Technopole

2/ A DUAL GOVERNANCE TO ENSURE INDEPENDENCE

The Bylaws and Regulations of Human Technopole, approved by DPCM in 2018, provide for a governance system structured according to a **dualistic model**. In particular, the **Supervisory Board**, chaired by the Foundation's President, is the body responsible for the general direction and control of the Foundation's activities, while the **Management Committee**, chaired by the Foundation's Director, is the administrative body responsible for carrying out the activities necessary to ensure the ordinary progress and achievement of the Foundation's purpose.

The President

The President is the Legal Representative of the Foundation and, as mentioned, serves as Chairman of the Supervisory Board. He is responsible for **approving the strategies** proposed by management, manages **institutional and public relations** and promotes **training and dissemination** activities related to the social and economic impact of scientific research and the Foundation's public engagement. Marco Simoni is the first President of the Foundation, appointed on 16 May 2018 by decree of the President of the Council of Ministers.

The Director

The Director is chosen among scientists of international reputation, with a prestigious academic record and proven leadership capacity in large-scale multidisciplinary scientific infrastructures. He is appointed for a four-year term by the Supervisory Board following an international competitive procedure, managed by a Search Committee appointed for this purpose by the Supervisory Board. The Director of the Foundation is responsible for the **implementation of the multi-year strategic plan** approved by the Supervisory Board and his term of office is renewable only once. Prof. Iain Mattaj is the first Director of Human Technopole.

The Supervisory Board

The Supervisory Board ensures the **excellence** of the Foundation and **compliance** with the rules for the appointment of its bodies, verifies the **use of resources**, oversees the **general coordination** of internal control functions, manages the process of scientific evaluation of the Foundation's activities and carries out **general guidance and control activities**.

When fully operational, the Supervisory Board is composed of **thirteen members**, including the President, appointed by the Prime Minister and includes representatives of the three founding Ministries - Economy and Finance, Health and University and Research - of the Lombardy Region and the Municipality of Milan, the CRUI, the Consulta degli Enti Pubblici di Ricerca, as well as two independent international scientists.

The Management Committee

The Management Committee is exclusively responsible for carrying out the activities necessary to ensure the **orderly progress and achievement of the Foundation's purpose**. The Committee is composed of five members, including the Director who chairs it, appointed by the Supervisory Board following a competitive procedure among candidates who possess the requisites of professionalism and integrity, as well as proven legal-administrative, economic-corporate experience or experience in the organisation and management of scientific research centres or public health institutes. Each member of the Management Committee remains in office for four years and until new members are appointed.

The Scientific Committee

In order to ensure the efficiency, effectiveness and cost-effectiveness of the Foundation's actions, the Supervisory Board has decided to proceed in 2019 with the establishment of a **Scientific Advisory Board** which, during the phase of the realisation of the laboratories and the completion of the recruitment of scientific personnel would provide through its own activities, on a temporary basis and, in any case, no later than 1 March 2022, to perform the functions and powers provided for by the Statutes to be performed by the Scientific Committee, whose high operating costs would not be consistent with the concrete activities that it would be called upon to perform in the initial phase. This body, during 2020, carried out an **advisory and evaluation** activity for the benefit of the Supervisory Board and the Management Committee with regard to the 2020-2024 multiannual Strategic Plan, the appointment of committees for the selection of scientific staff and the purchase of scientific equipment.

The Board of Auditors

The Board of Auditors consists of **three full members and three alternate members**. They are appointed among those included in the register of auditors by decree of the President of the Council, at the proposal of the Ministry of Economy and Finance and after designation by the Founding Ministries. Each Founder chooses one full member and one alternate. The members of the Board of Auditors remain in office for three years.

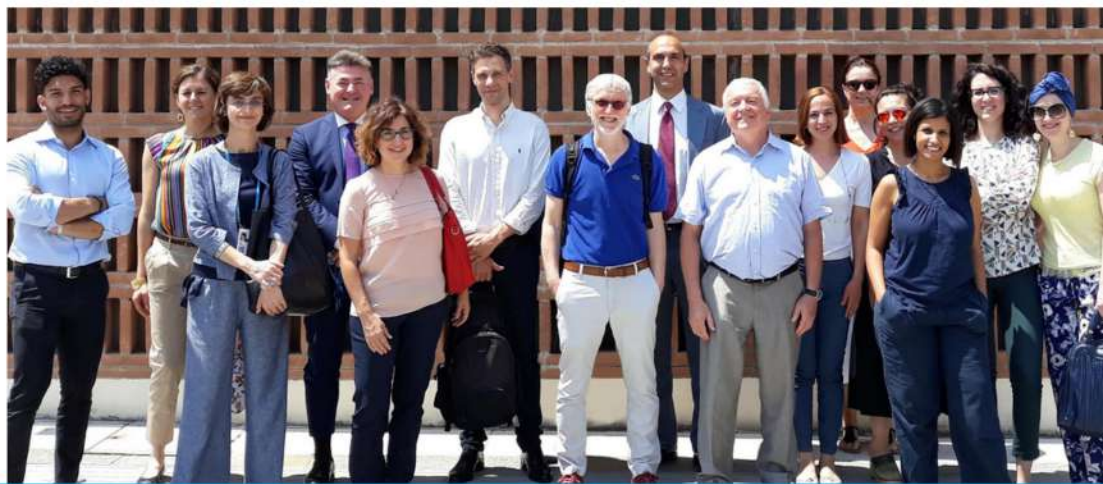
The Board of Auditors **monitors the administration and accounts** of the Foundation, carries out **cash audits**, prepares **reports on the budget and final accounts** to be approved by the Supervisory Board.

3/ THE CHALLENGE

In January 2019, with the arrival of Director Mattaj and the first executives, the true adventure of Human Technopole began, whose **mission** is to act as a catalyst for the advancement of current knowledge on the mechanisms underlying pathologies, **developing a multidisciplinary and integrated approach in the disciplines of biomedical sciences and data**, also in connection with the university system and research institutions.

How?

Primarily conducting **frontier research in the life sciences**, with a focus on biology and human health, with the overarching aim to contribute to the development of **new personalised and preventive medicine approaches**.



In order to adequately support this type of research, the Campus development project includes the creation of services and technology platforms that will be available not only to the Institute's scientists, but to the entire national and international life sciences scientific community, including the necessary training activities.

Alessandro Vannini

Head of Structural
Biology Research
Centre

Master Degree in Biological Sciences at the Terza Università in Rome, PhD in Biochemistry and Molecular Biology at Tor Vergata University. Formerly Principal Investigator and Deputy Head of Division at the Institute of Cancer Research in London.



The **ultimate aim** of setting up Human Technopole, in fact, is to create not just a research centre, but a scientific infrastructure that can **bring added value to the Italian research ecosystem**. A place open to the external scientific community, with cutting-edge technologies and tools, capable of attracting further funding and investments. The challenge is to ensure that Human Technopole's **public investment** is also accompanied by the **attraction of private funds** so as to supplement and increase the Institute's budget far beyond the annual public allocation.

But all this has to be built from scratch, in an area designed to accommodate a universal exhibition, with a parallel effort involving not only the **recruitment of the administrative staff** essential for the implementation of state-of-the-art infrastructure, but also the **selection of scientific leadership**. For the latter, the same method is adopted as for the Director: open international calls and following rigorous selection procedures, supported by impartial research committees and commissions composed of distinguished international scientists, mostly from outside Human Technopole.



**Gaia
Pigino**

Associate Head of
Structural Biology
Research Centre

Degree and PhD from
the University of Siena,
former Group Leader
and
Faculty Member at the
Max Planck Institute of
Molecular Cell Biology
and Genetics in
Dresden.

The ambition is to act as a **bridge between Italy and the rest of the world**, attracting the best talents to HT in an environment that facilitates not only their retention but also the expansion of their network, bringing together the national dimension of the Human Technopole project with its marked international vocation. Hence the need, for example, to adopt English as the Institute's working language.

**Andrea
Sottoriva**

Head of
Computational
Biology Research
Centre

Degree at the University
of Bologna, PhD at the
University of
Cambridge, former
director of the Center for
Evolution and Cancer at
the Institute of Cancer
Research in
London.



In January 2019, Human Technopole starts with 500 square metres of office space and 13 employees including the Director, with the aim of reaching 63,000 square metres of office and laboratory space by 2026, to accommodate up to 1,000 people, with 80% scientific and 20% administrative staff among the Foundation's employees.

4/ WHERE WE ARE NOW

Today, Human Technopole employs **250 people**, including administrative staff, researchers, collaborators and PhD students, of **22 different nationalities**.

Thanks to a patient selection work based on strict merit-based criteria and following international standards, the first **Heads of Research Centres** were chosen. These are **seven Italian researchers coming from some of the most important and prestigious centres in the world**.

This marked internationality is also reflected in their teams, whose members were recruited by applying the same merit criteria, through individual, open, international calls: the result is that **60% of Human Technopole researchers come from leading foreign research institutes and the majority of these are first-time Italians working in their country after a career abroad**, in line with the ambition of Human Technopole to fuel the circulation of brains and talents at the international level.



**Piero
Carninci**

Head of Genomics
Research Centre,
Functional
Genomics

Degree and doctorate
at the University of
Trieste, deputy director
of the RIKEN centre in
Yokohama.



**Nicole
Soranzo**

Head of Genomics
Research Centre,
Population e Medical
Genomics

Degree from the
University of Milan, PhD
from the University of
Dundee, Professor at the
University of
Cambridge and former
senior group leader at
Wellcome Sanger
Institute in Hinxton.

A great deal of attention has been paid to the composition of the administrative team, which is crucial in helping to rapidly develop the research support activities and infrastructure needed to start up the laboratories. Since 2019, thanks to them, Human Technopole has grown from 500 to 20,000 square metres of office and laboratory space, which can accommodate up to 450 people. Palazzo Italia was completely refurbished and inaugurated in November 2019 in the presence of the then Prime Minister, Giuseppe Conte.

Giuseppe Testa

Head of
Neurogenomics
Research Centre

Degree at the University of Perugia, PhD at EMBL, Professor at Università Statale in Milan and Director of the High Definition Disease Modelling Lab: Stem Cell and Organoid Epigenetics at the European Institute of Oncology.



The research objectives and activities for the five-year period 2020/2024 were detailed in the **multi-year Strategic Plan**, drawn up by the scientific leadership, evaluated by the Scientific Advisory Board and approved by the Supervisory Board. The Strategic Plan is the central plank of Human Technopole's strategy to contribute to life sciences research **with a global approach and interdisciplinary study of human biology, aimed at understanding the basic mechanisms regulating physiology and disease.**

The goal of Human Technopole's research is indeed to advance our understanding and develop new therapeutic strategies (including ATMPs, advanced therapy medicinal products) for various groups of chronic and degenerative diseases such as: cancer and cardiovascular diseases and their intermediate phenotypes; neurodegenerative and neurodevelopmental disorders, such as autism and intellectual disabilities; rare and orphan diseases, such as primary ciliary dyskinesia; and respiratory diseases, such as cystic fibrosis.

Although our first laboratories were completed in the first half of 2021, the researchers recruited by the Foundation have already published dozens of scientific papers, including publications in prestigious journals such as Nature, Nature Communications and Science. Among them, three have even earned the covers of Science, Trends in Neuroscience and Molecular Cell.



Emanuele Di Angelantonio

Head of Health Data
Science Research
Centre

Degree at La Sapienza University, PhD at the University of Cambridge where he teaches and is Deputy Director of the Unit of Cardiovascular Epidemiology (Department of Public Health & Primary Care)

In April 2021, work was completed on the construction of the **Incubator Labs** and the redevelopment of the Campus' North Pavilion and South Pavilion, which house Human Technopole's **first experimental genomics, neurogenomics and structural biology laboratories**, equipped with cutting-edge technologies that will be made available to all Italian researchers, openly and with access through competitive tenders.



2020-2021

Incubator Labs

CENTRES: Neurogenomics, Genomics, Computational Biology, Structural Biology
FACILITY: Genomics, ASCOF
CORE SERVICES & LABS: warehouses, washing, sterilisation and sample preparation, cell culture, cryogenic storage, tissue processing

2020-2021

North Pavilion

FACILITY: Cryo-electron microscopy, Light imaging

2019

Palazzo Italia

Institutional headquarters
CENTRES: Computational Biology
CORE SERVICES & LABS: warehouses, long-term storage, Data Centre

2022

South Pavilion

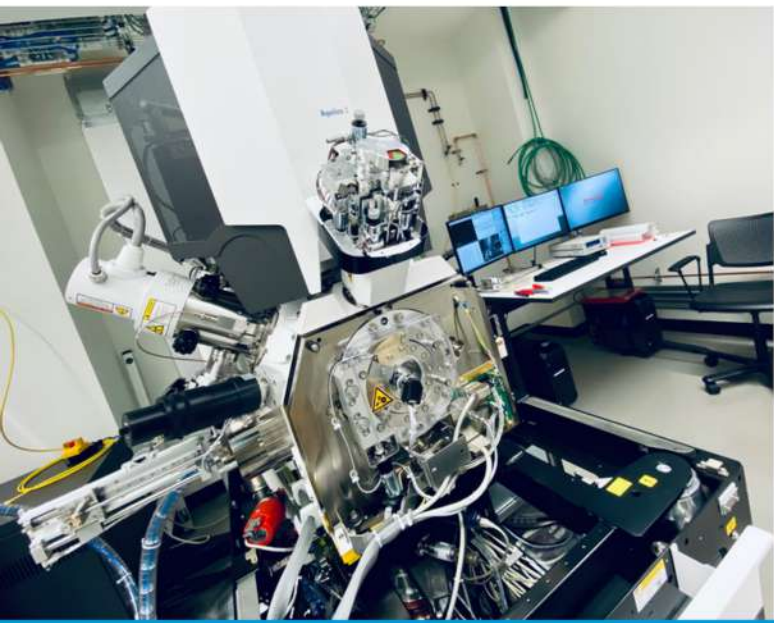
CENTRES: Neurogenomics, Genomics, Computational Biology
FACILITY: FACS, ASCOF
CORE SERVICES & LABS: warehouse, cell cultures, cryogenic storage

2026

South Building

These are unique technologies that will open up new frontiers for life science research, such as the five microscopes (Titan Krios, Spectra, Glacios, Talos and Aquilos) of the Cryo-Electron Microscopy Facility installed in May 2021 or the Next Generation Sequencing (NGS) sequencers in the Genomics Facility in July, which will soon be joined by the equipment of the innovative Automated Stem Cell and Organoid Facility under construction.

All this in spite of the ongoing pandemic, which has slowed down part of the infrastructure construction activity.



Cryo-Electron Microscopy Facility



Genomics Facility

Cryo-Electron Microscopy Facility



In April 2020, an international competition was awarded to design the **new building at the centre of the Human Technopole Campus**, the entire research area - of which the new building will be the core - whose construction will be completed in 2026. In addition to the laboratories and facilities envisaged by the Human Technopole Strategic Plan, the Campus will also house the National Platforms envisaged by the Convenzione signed in December 2020 with the founding Ministries.



Science

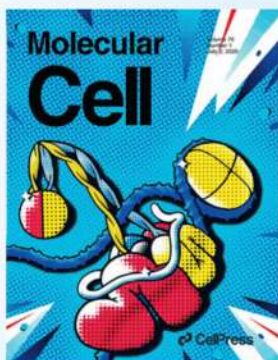
Tubulin glycylation controls axonemal dynein activity, flagellar beat, and male fertility

Gaia Pigino

Structural Biology Research Centre

Cryo-electron microscopy techniques have made it possible to reconstruct the three-dimensional structure of the mouse spermatozoon tail and have revealed that the addition of an amino acid, glycine, to the structural components of the tail is essential for the proper movement of spermatozoa towards the oocyte and therefore for fertility.

In fact, following Law No. 160/2019, implemented through the above-mentioned Convenzione, Human Technopole's mission also include creating and managing technological services and infrastructures available to scientists from outside the institute, to meet the needs of the scientific community in the life sciences sector. The **National Platforms** envisaged by the Convenzione and identified through consultations with the entire scientific community will be added to the Human Technopole facilities, which were also designed precisely to provide access to external researchers, to the benefit of the entire Italian research system in the sector. The consultations are currently under way and the National Platforms will give a further boost to life sciences in Italy.



Molecular Cell

Human Condensin I and II Drive Extensive ATP-Dependent Compaction of Nucleosome-Bound DNA

Alessandro Vannini

Structural Biology Research Centre

Analysis of the architecture of the protein complexes Condensin I and Condensin II reveals a new mechanism for DNA compaction and genome organisation in human cells.

In addition, Human Technopole has made its own contribution to the **fight against COVID-19** by conducting molecular studies on the immune cells of patients affected by COVID-19, integrating immunogenomic characterisation with clinical and epidemiological analyses conducted by hospital and university collaborators on the large cohorts involved from the Luigi Sacco Hospital in Milan, the Città della Speranza Paediatric Research Institute in Padua and the Humanitas Clinical Institute in Milan. Human Technopole, together with the German Centre for Neurodegenerative Diseases, is also coordinating a large European research consortium for experimental activities that will allow us to understand the long-term effects of COVID-19 on the central nervous system, through the use of brain organoids.

The spirit of openness towards the national scientific community that characterises Human Technopole's research has already resulted in **numerous partnerships and collaborative initiatives with universities, hospitals, IRCCSs and both public and private biomedical research institutes throughout Italy**. Framework agreements have been concluded with the Universities of Naples, Turin, Rome Tor Vergata, Statale di Milano, Scuola Internazionale Superiore di Studi Avanzati (SISSA) and Eurac Research. Following the increase in HT's critical mass in terms of researchers over the past year, numerous other collaboration agreements with national and foreign research partners are currently being established.



Trends in Neuroscience

Basal Progenitor Morphology and Neocortex Evolution

Nereo Kalebic

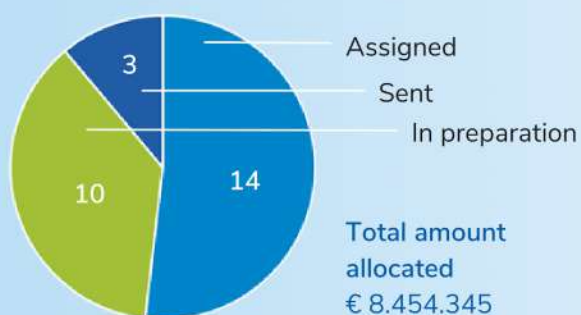
Neurogenomics Research Centre

The morphology of neural progenitors, specialised cells in the cerebral cortex that generate neurons, determines their proliferative capacity and is fundamental to the evolution and development of the brain.

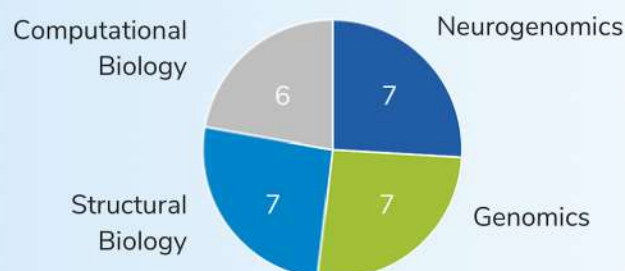
In line with HT's desire to enrich the national research ecosystem by sharing its expertise, infrastructures and resources, HT has been engaged in **research projects aimed in particular at the genomic characterisation of existing national cohorts**, with the goal of improving the understanding of the genetic diversity of the Italian population and the predisposition to specific diseases such as autism spectrum disorders, and to further the study of the mechanisms that cause them. Similar initiatives, involving numerous researchers from different HT Research Centres, have been launched with the IRCCS Neuromed in Molise and the IRCCS Associazione Maria Santissima di Troina, in Sicily.

RESEARCH FUNDING - External grants and scholarships / Jan 21 - Mar 22

GRANTS AND SCHOLARSHIPS



GRANTS AND SCHOLARSHIPS PER RESEARCH CENTRE



Human Technopole's mission also includes the **promotion of innovation and progress through technology transfer** and the creation of relations with the industrial world to foster the transformation of scientific discoveries into tangible applications that benefit patients and society. Following intensive exchanges with both Italian and international interlocutors, the **first partnerships and research projects in collaboration with pharmaceutical and scientific equipment manufacturers** have already begun.

Remaining in the field of innovation promotion, Decree-Law No. 34 of 19 May 2020 (converted into law on 17 July 2020, no. 77), entrusts HT with the task of setting up a '**Centre for Innovation and Technology Transfer in the field of Life Sciences**': HT has initiated a dialogue with the main business, financial and research entities in the life sciences sector, on the basis of which, we are working on the creation of a shared platform, which does not duplicate the experiences that already exist in the area, but - on the contrary - supports and integrates them, activating a special department to launch activities.

CITT

Centre for Innovation and Technology Transfer

July
2021

HT established CITT as an internal department

23-24 February
2022

Workshop on TechTransfer in Life Sciences
(hybrid mode)

300 young life science researchers enrolled

Second semester
2022

Dedicated courses for selected participants.

Participation of industry speakers with the aim of supporting
researchers in exploiting research results and creating
managerial figures for start-ups and entrepreneurial
initiatives for the valorisation of intellectual property

EARLY CAREER FELLOWSHIP PROGRAMME

The ECF Programme supports the professional development of talented researchers by helping them to start their own independent research activities in Italy. Each year, up to five young researchers can win a scholarship of EUR 200,000 for five years to support their research at an Italian host institute.

Increasingly effective drugs for COVID-19, new therapies against brain tumours, understanding why the brain of primates is much more refined than that of other animals, the role of the alteration of the immune system in the onset of serious neurological disorders and the study of the microbiome's ability to protect the human body from infection by harmful microorganisms: these are the ambitious aims of the winning projects of the first edition.



**Veronica
Krenn**

comes from the Institute for Molecular Biotechnology in Vienna and will develop her project 'Human neuroimmunobiology' at the University of Milan-Bicocca.



**Gabriele
Micali**

comes from the ETH Zurich and Eawag and will develop his project 'Individual behaviours matter: understanding colonisation resistance in the human gut from a bacterial single-cell perspective' at the IRCCS Humanitas in Milan.



**Carmen
Falcone**

comes from the University of California and will develop her project 'The role of interlaminar astrocytes in the primate brain' at the Scuola Internazionale Superiore di Studi Avanzati (SISSA) in Trieste.



**Mirko
Cortese**

comes from the University of Heidelberg and will develop his project 'Unravelling the molecular and structural determinants of SARS-CoV-2-induced cellular remodelling and cytopathogenesis' at TIGEM in Naples..



**Dafne Campigli
Di Giammartino**

comes from the Weill Cornell Medical School in New York and will develop her project 'Epitranscriptomic modulation of chromatin architecture' at the IIT in Genoa.

In January 2022, on the occasion of the third anniversary of Director Mattaj's arrival, Human Technopole has already received numerous European grants, including the first **ERC Starting Grant**, a prestigious research call awarded by the European Commission to talented young scientists. The winner of the €1.5 million grant is Francesca Coscia, a researcher at the Centre for Structural Biology working on studies on the molecular mechanisms of the thyroid gland and previously working at the MRC Laboratory of Molecular Biology in Cambridge, UK.

5/ A HUB TO GIVE VALUE TO THE ECOSYSTEM

The creation of an avant-garde research centre within the area that hosted Expo Milano 2015, has made it possible to launch an urban reconversion project that is the result of an important public-private partnership between Arexpo, the majority public company that owns the area, and Lendlease, an Australian multinational that was awarded a 99-year concession for the development of **MIND - Milano Innovation District**.



In fact, the presence of Human Technopole in Milan's new innovation district has fostered the attraction of other major players in the life sciences sector, such as the Galeazzi Hospital and the University of Milan, and of national and international private investment in excess of three billion euros. The innovation ecosystem that, thanks to the launch of the Human Technopole project, is being set up in MIND has also already attracted more than 30 large innovative companies, both national and foreign, which have already set up joint activities, waiting to be able to establish themselves within the district. Among them, the first will be Astrazeneca, Bio4Dreams, Rold and Illumina.

This concentration of industry stakeholders in a single territory will be the start, as the best international experiences teach us, of that cross-pollination which is at the basis of innovation.

Human Technopole's footprint in the district also includes aspects linked to the community: the Foundation, for example, has promoted an action to change the district's **toponymy** - approved and currently being implemented by the Milan and Rho municipalities - **to name streets after women and men of science, innovators and leading figures in the life sciences**, with a proposal that, for the first time in Italy, sees an appropriate gender breakdown. The first street to be renamed was the one on which Palazzo Italia opens, named at our request after **Nobel Prize winner for Medicine Rita Levi-Montalcini**.



This initiative is part of a broader programme of activities by the Foundation to promote the **value of science to the general public**. A programme that has seen the realisation of initiatives such as '**HTpresents - Dialogues on Science and Society**', the cycle of events that Human Technopole launched in 2021 to reflect with other civil society actors on current events, the challenges facing the world today and how scientific research can help us to better understand them. All of this is done by taking a cue from a different text or essay that we read, together with the author also through the lens of science.

Human Technopole also contributed to the **work of the G20** through the presentation of a paper entitled '**Global health and covid-19. Culture and sciences for life: towards a global health literacy alliance for a sustainable future**'.

Human Technopole's constant attention to its stakeholders is also evidenced by its efforts to create an **Integrated Reporting**, the first version of which has recently been implemented, initiating a process of transparency and reciprocity towards our relevant stakeholders.

Interlocutors without whom it would not have been possible to achieve the results obtained in just three years of operation that have seen Human Technopole drive the development of a large science and innovation park, the concrete legacy of Expo 2015, of which it represents the full realisation and expression.



6/ THE FUTURE OF HT

HT will continue to grow not only by recruiting talent from around the world and building state-of-the-art infrastructure and laboratories, but also by creating collaborations with players in the life sciences supply chain.

Among the projects that will bear fruit in the near future is that of our Genomics Centre with the Istituto Neurologico Mediterraneo - Neuromed IRCCS in Isernia for the analysis of the DNA of over 24,000 citizens who have been participating in the large epidemiological study 'Moli-sani' since 2005. Through the comprehensive DNA analysis of the participants, HT will investigate how the expression of individual genes varies in the subjects, highlighting recurring characteristics that are associated with the likelihood of developing certain diseases. In this way, we will help identify **tools for prevention and early diagnosis** of these diseases.

Another project that will open up new scenarios for scientific research - in this case in the field of the autism spectrum and intellectual disability - is that of the Centre for Neurogenomics in collaboration with the IRCCS Associazione Oasi Maria Santissima in Troina. Thanks to the data collected by the Sicilian institute, our neuroscience experts will sequence the biological samples of 1,500 people with autism disorder, in order to understand the genetic and epigenetic mechanisms activated during brain development.

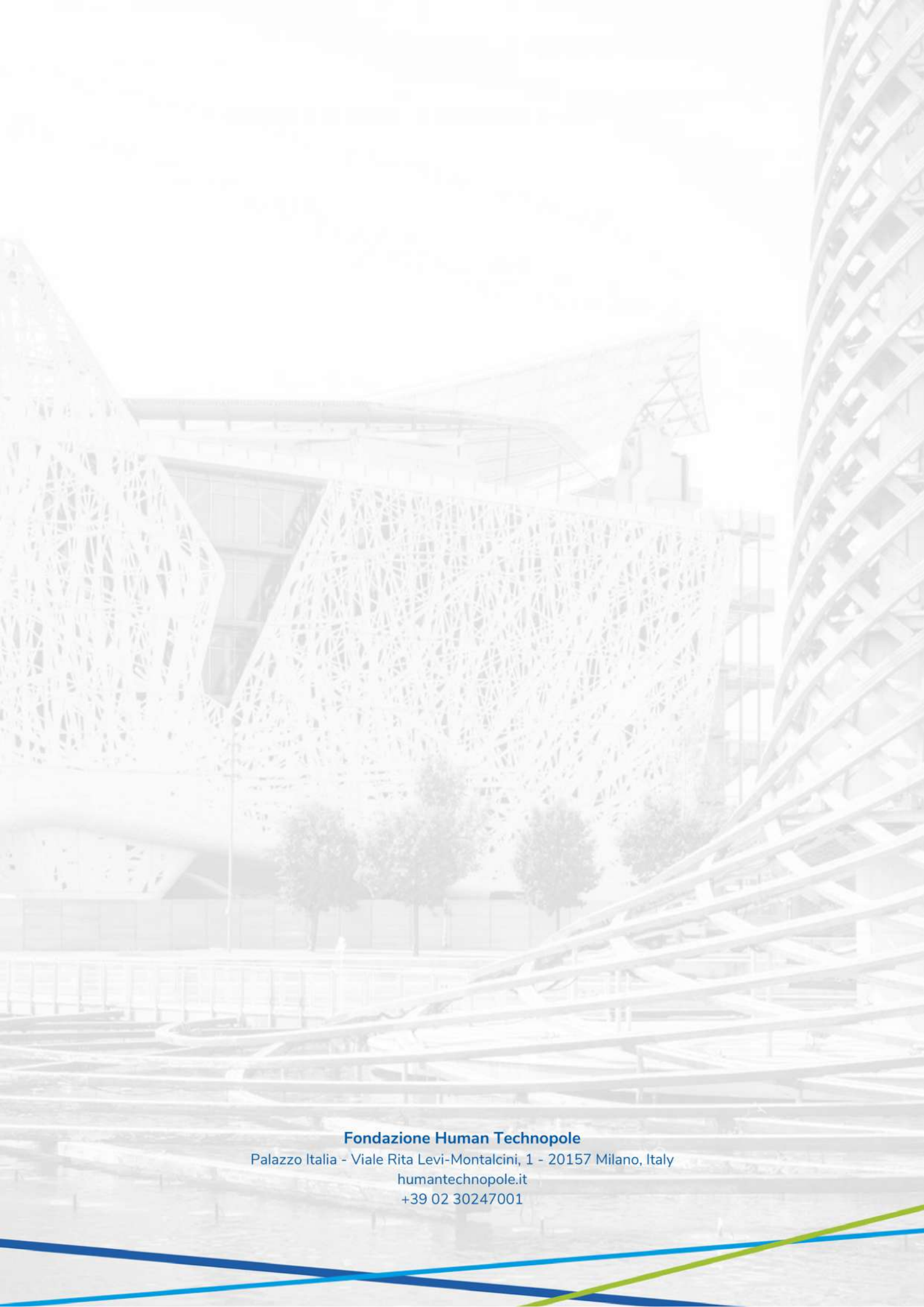
In the coming years, we will launch new calls for our **Early Career Fellowship Programme** and we will follow the projects of the winners, who will carry out their activities at institutes and Italian universities, other than HT, and through them we will have exchanges with the best scientific realities of our country.

As soon as the Public Consultation foreseen by the Convenzione is concluded, we will start working on the implementation of the **National Platforms**, thus becoming an innovative and crucial node for the national and international life sciences scientific community.

We will strengthen our ties with the business system and promote innovation through the new **Technology Transfer Centre**, which has already launched the first training initiatives dedicated to the national scientific community.

Finally, we will continue to tell
the story of Human Technopole,
an evolving project.

A project belonging to all, like
the science it produces.



Fondazione Human Technopole

Palazzo Italia - Viale Rita Levi-Montalcini, 1 - 20157 Milano, Italy

humantechnopole.it

+39 02 30247001