



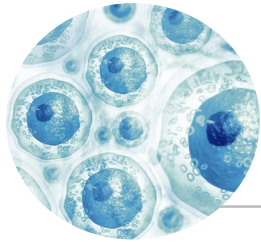
National Facility for Genome Engineering and Disease Modeling

Giovanni Fagà, Head National Facility for
Genome Engineering and Disease Modeling,
Human Technopole

For technical enquiries about the services:
nf.gedi@fht.org

Mission

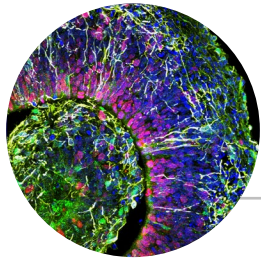
Provides off-the shelf services, resources and scientific support in



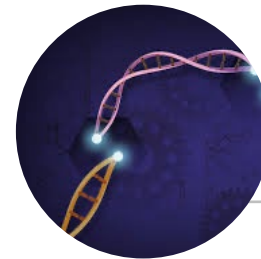
STEM CELL BIOLOGY



LAB AUTOMATION



PSCs DIFFERENTIATION



GENOME ENGINEERING

Disease Modeling Platform

OUR SERVICES



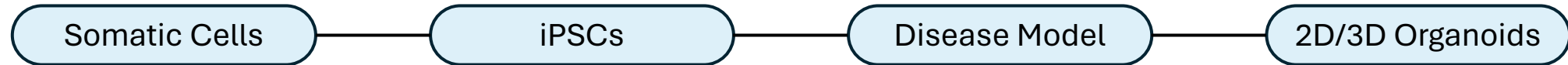
Reprogramming



Gene Editing



Differentiation



Disease Modeling Platform

OUR SERVICES



Reprogramming



Gene Editing



Differentiation

Somatic Cells

iPSCs

Disease Model

2D/3D Organoids



HT



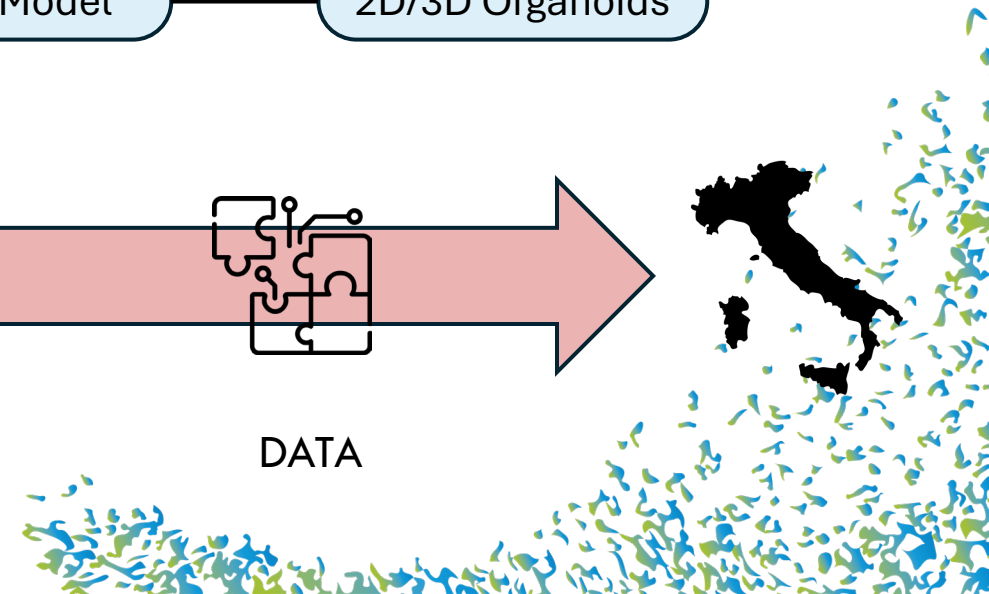
IMAGING

STRUCTURAL
BIOLOGY

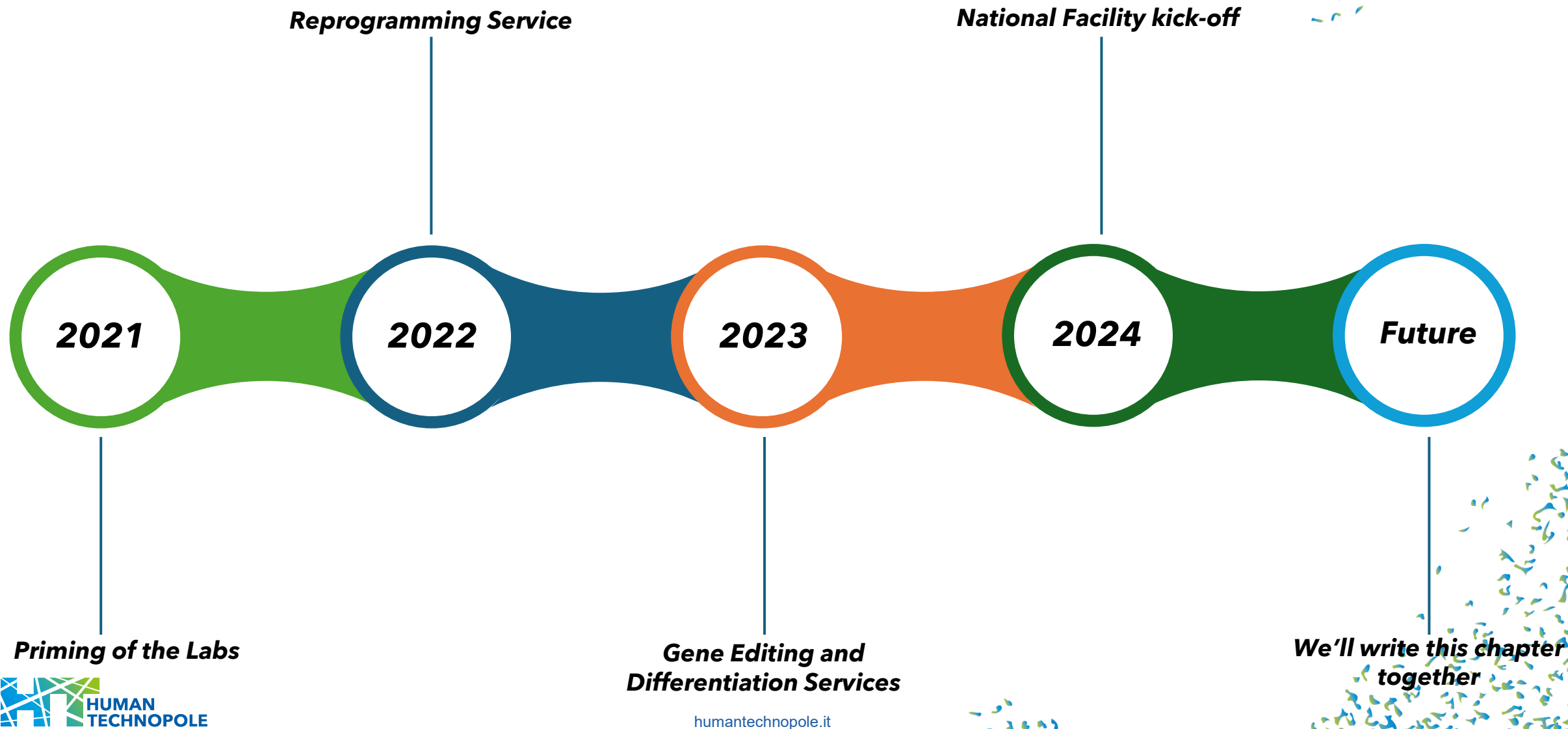
GENOMICS

DATA

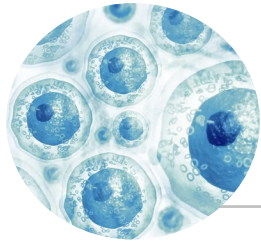
humantechnopole.it



The Roadmap



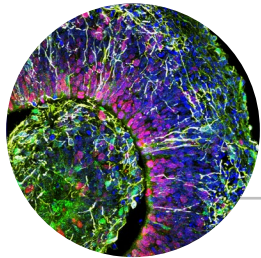
Mission



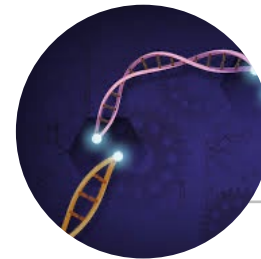
STEM CELL BIOLOGY



LAB AUTOMATION

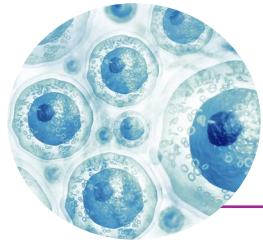


PSCs DIFFERENTIATION



GENOME ENGINEERING

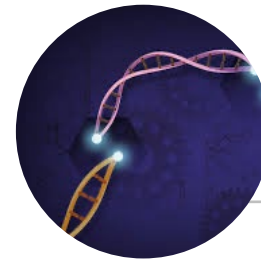
Mission



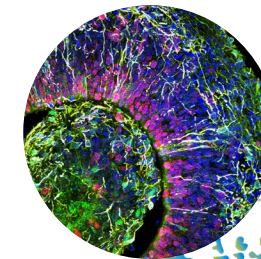
STEM CELL BIOLOGY



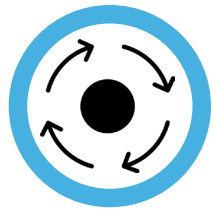
LAB AUTOMATION



GENOME ENGINEERING



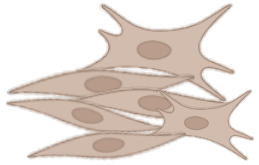
PSCs DIFFERENTIATION



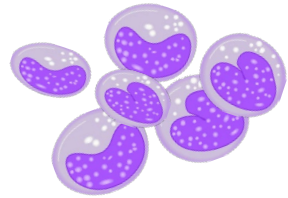
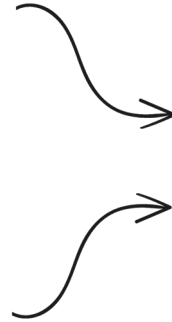
Reprogramming

- PBMCs
- Fibroblasts
- Renal Epithelial

Fibroblasts

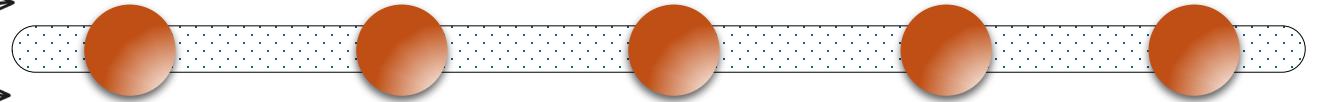


nm-RNAs



Sendai

PBMCs



2-3 months



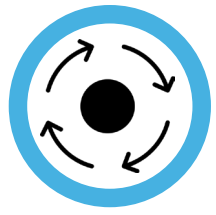
10 cryotubes



Certificate of Analysis

iPSC
MASTER BANK

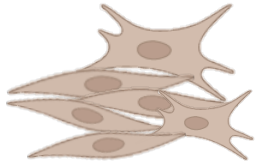




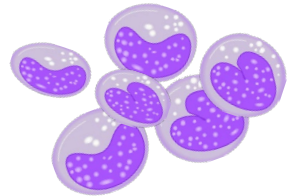
Reprogramming

- PBMCs
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Fibroblasts

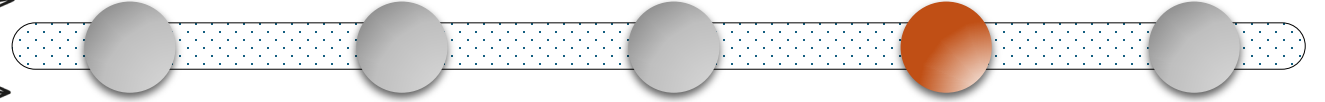


nm-RNAs



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PBMCs



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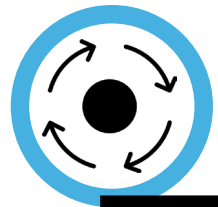
10 cryotubes



Certificate of Analysis

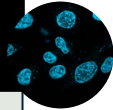
iPSC
MASTER BANK





Characterization > Certificate of Analysis

Mycoplasma



PBMCs

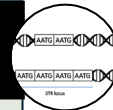


Expansion



Banking

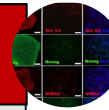
STR Cell Identity



GenePrint © 10
Spectrum Compact



Pluripotency - IF



Embryoid Bodies

14-21 days

FOXA2

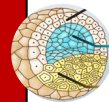
SOX17

SMA

NESTIN

PAX6

Undifferentiated state - IF



NANOG

OCT3/4

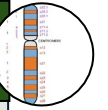
SOX2

SSEA-1

SSEA-4

TRA-1-60

CNV - Karyotype



Low-Pass Seq

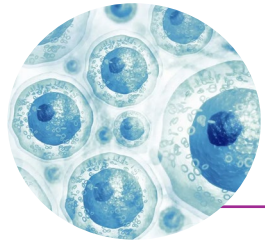
G-Banding

Recovery

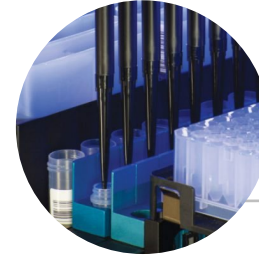


2+ weeks after banking, cells are thawed and cultured for 3-5 days

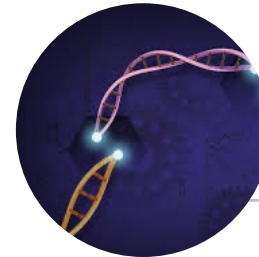
Mission



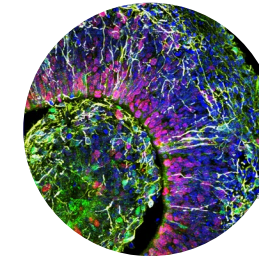
STEM CELL BIOLOGY



LAB AUTOMATION

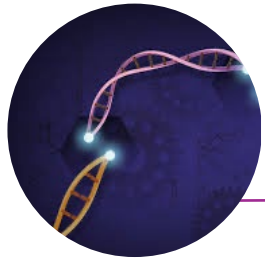


GENOME ENGINEERING

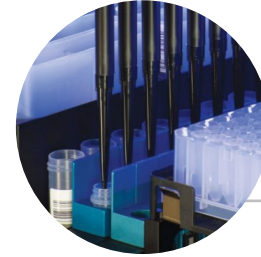


PSCs DIFFERENTIATION

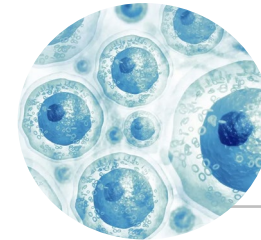
Mission



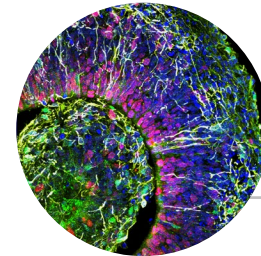
GENOME ENGINEERING



LAB AUTOMATION



STEM CELL BIOLOGY



PSCs DIFFERENTIATION



Gene Editing

Knock-out

1

One gene
InDels

Knock-in

2

Point Mutations
Reporter lines and tags
Safe harbor integration

Experimental

Base Editing

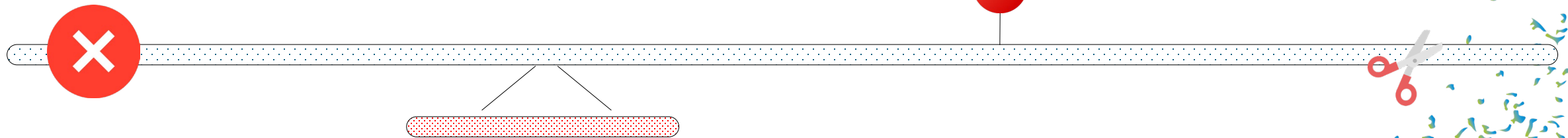
3

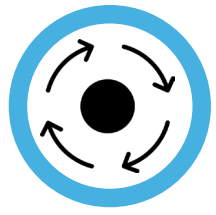
Recombinant
Editors

Custom Projects

4

Gene Families
RNA targeting
Epigenetic
...



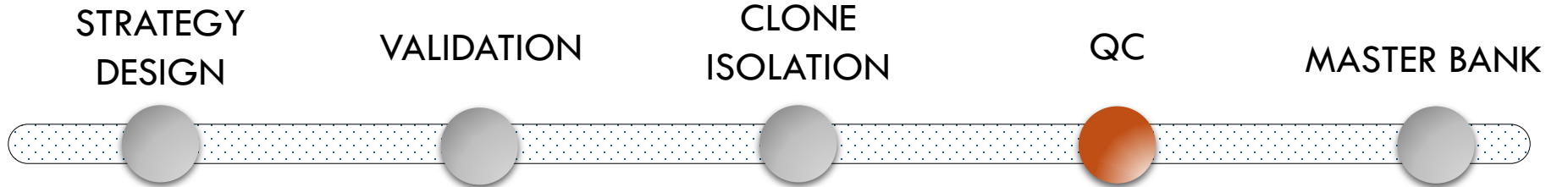


Gene Editing

iPSCs and ESCs



Cancer Cell lines



2-3 months



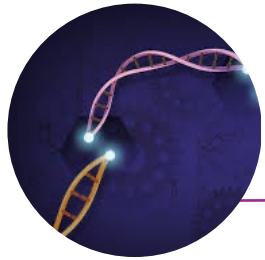
10 cryotubes



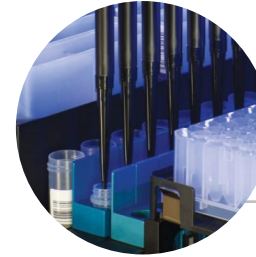
Certificate of Analysis



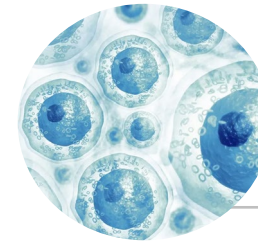
Mission



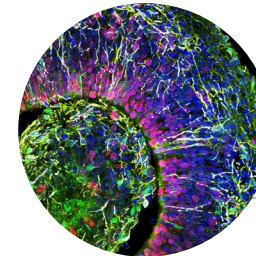
GENOME ENGINEERING



LAB AUTOMATION

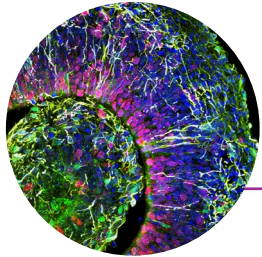


STEM CELL BIOLOGY



PSCs DIFFERENTIATION

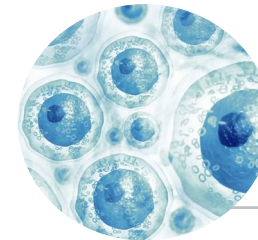
Mission



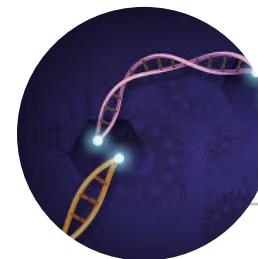
PSCs DIFFERENTIATION



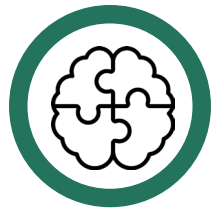
LAB AUTOMATION



STEM CELL BIOLOGY



GENOME ENGINEERING



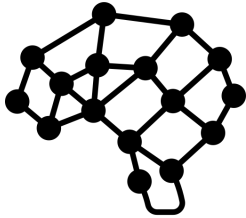
Differentiation

Experimental



Brain

1



Cortical
Cerebellar

Sloan S.A. et al., *Nature Protocols* 2018
Trujillo C. A. et al., *Cell Stem Cell* 2019

Cardio

2

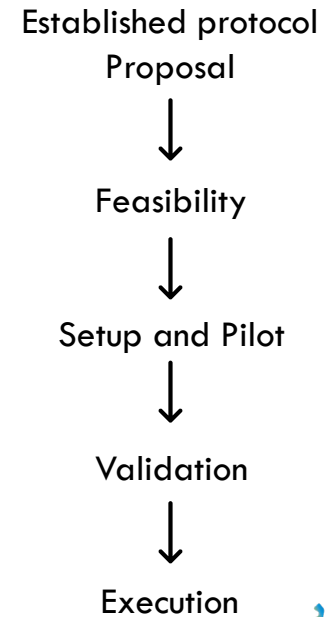


Cardioids
Cardiomyocytes

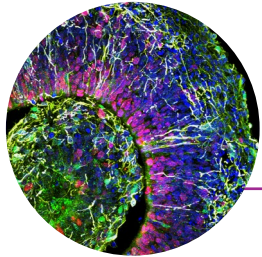
Lewis-Israeli Y.R. et al., *Nature Communication* 2021

Custom Projects

3



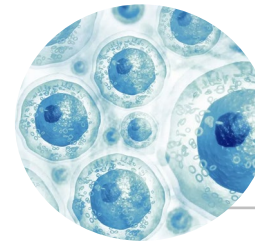
Mission



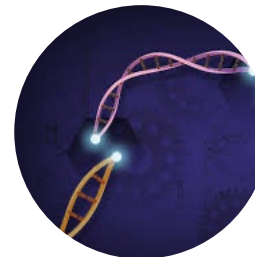
PSCs DIFFERENTIATION



LAB AUTOMATION



STEM CELL BIOLOGY

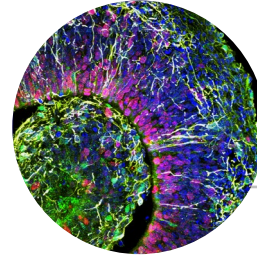


GENOME ENGINEERING

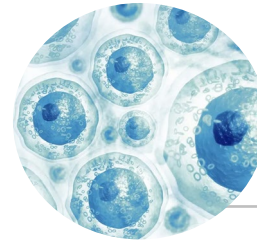
Mission



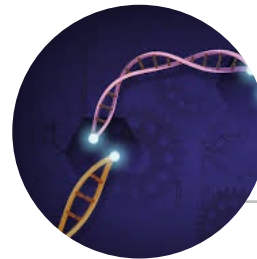
LAB
AUTOMATION



PSCs DIFFERENTIATION



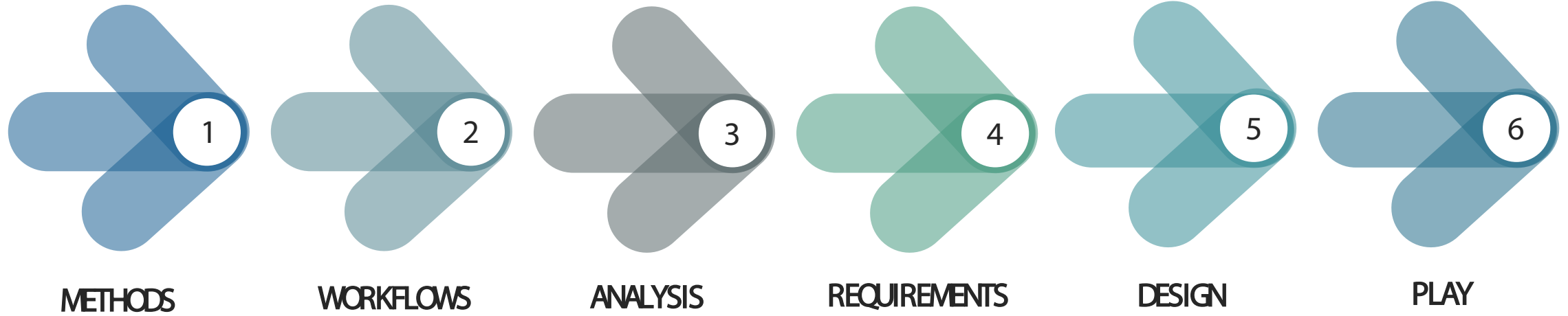
STEM CELL BIOLOGY



GENOME ENGINEERING



Automation



Design and implementation of a robotic platform for the **automation** of **2D** and **3D** cell culture workflows



Automation



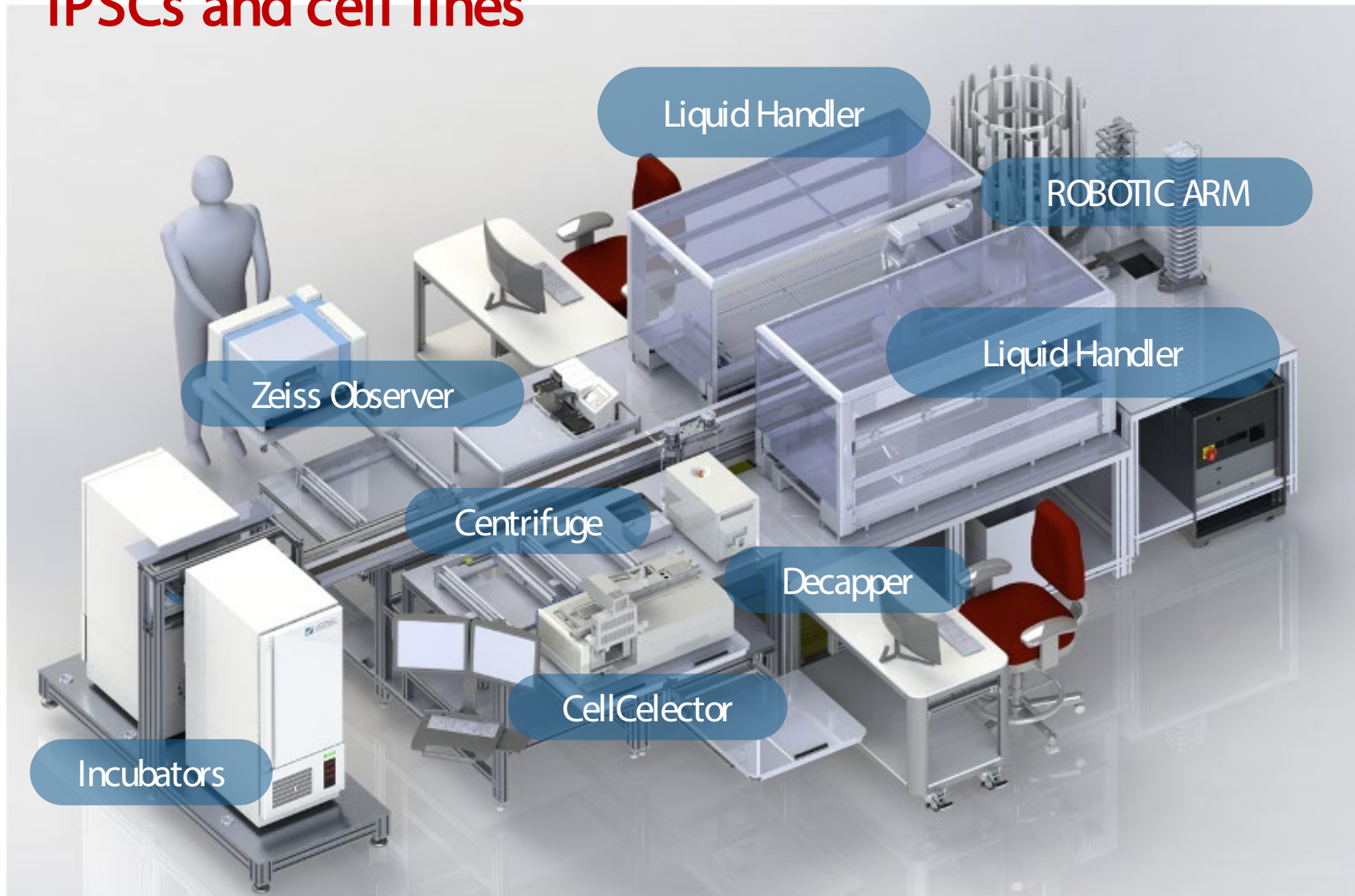
Design and implementation of a robotic platform for the **automation** of **2D** and **3D** cell culture workflows



Automation

iPSCs and cell lines

WORKCELL 1



Training

PSCs basics

Stem Cell handling



Gene Editing

Basic Principles

HANDS-ON
COUNSELLING
SHADOWING

The Team



SARA LANDI



CHIARA AMBROSINI



ELISABETTA FIACCO



PATRICIO FUENTES BRAVO

JACOPO ZASSO



GIACOMO FRATI



ALESSANDRO CORTI



ELEONORA PEDRAZZOLI



Thank you

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Palazzo Italia

Viale Rita Levi-Montalcini, 1 - 20157
Milan, Italy

humantechnopole.it