

BSGN
Business in Space Growth Network

LIFE SCIENCES INDUSTRY ACCELERATOR
Space for Inspiration – Jan 2024



MEDES – Institute for space physiology and medicine



- A hybrid organization for **SPACE** and **HEALTH**
- A multidisciplinary team with various health professionals & IT biomedical and space engineers
- Economic Group of Interest, main members: CNES et Toulouse Univ. Hospital

3 TYPES OF ACTIVITIES



Space exploration



Clinical research



Innovations / applications

Common fields of innovation



5P Medicine,
AI, Medical
devices



Biotech,
Pharma



Digital
Health,
Connected
Health



Environment
& health, tele-
epidemiology,
public policies



BSGN Life Sciences Industry Accelerator

Develop LEO-based commercial services addressing terrestrial Life Science and biomanufacturing challenges

- Bring Awareness of the Benefits of Space to the non-space community
- Build a Life Sciences community with commercial space providers and scientific/industrial partners

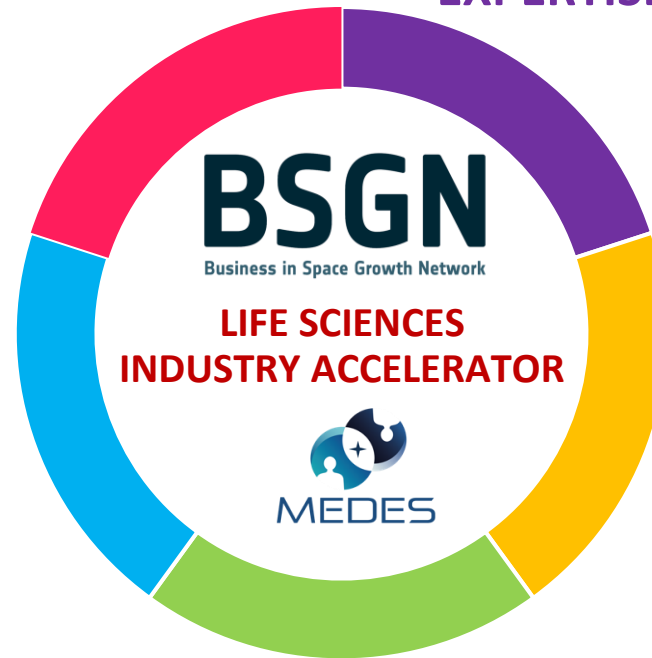
PROJECT MATURATION

- Illustrate and demonstrate the potential of microgravity for industrial applications
- Identify projects for space experiments
- Support access to space

NETWORKING

EXPERTISE

- New terrestrial industrial needs and use cases for space commercialization
- Support maturation of space offers related to industry needs
- Help define standard requirements for equipment / infrastructure



MODEL IDENTIFICATION

- Network new models for cooperation and innovation to generate IP
- Help make space a usual research environment for pharma / biotech

FUNDING

- Identify potential funding for space experiments and projects (ESA or non-ESA)
- Link with national delegates

Market assessment on Life Sciences

1 2021-2022 : MARKET ASSESMENT / STAKEHOLDER EDUCATION AND ENGAGEMENT

CHALLENGES IN TERRESTRIAL BIOMANUFACTURING MARKET

NEW BIOMEDICINE

To produce biomedicines with disruptive properties from new sources

SMALL VOLUME

To produce complex proteins in (very) small volumes for personalized medicine

MANUFACTURING EFFICIENCY

To improve the results of the entire manufacturing chain

NEW MODEL

To develop suitable design tools to save considerable time and money

LEO ASSETS FOR BIOMANUFACTURING MARKET

DIFFERENT BEHAVIOR OF LIVING ORGANISMS

Changes in gene expression, morphological modifications and changes in cellular physiology

ACCELERATED DISEASE MODEL

Accelerated model of age-related disorders

PROTEINS/CRYSTAL GROWTH

Molecule crystals grow larger with fewer defects, new polymorphs and morphologies of crystals to be discovered

PHASE CHANGES FOR PROCESS

Study of separation processes on both micro and macroscale



- 1-1 meetings,
- Webinars,
- Workshops,
- Events...

FIVE LEADING TERRESTRIAL SEGMENTS BENEFITTING THE MOST FROM MICROGRAVITY



ANTIBODIES



THERAPEUTICS
MOLECULES & PROTEINS



GENE THERAPY



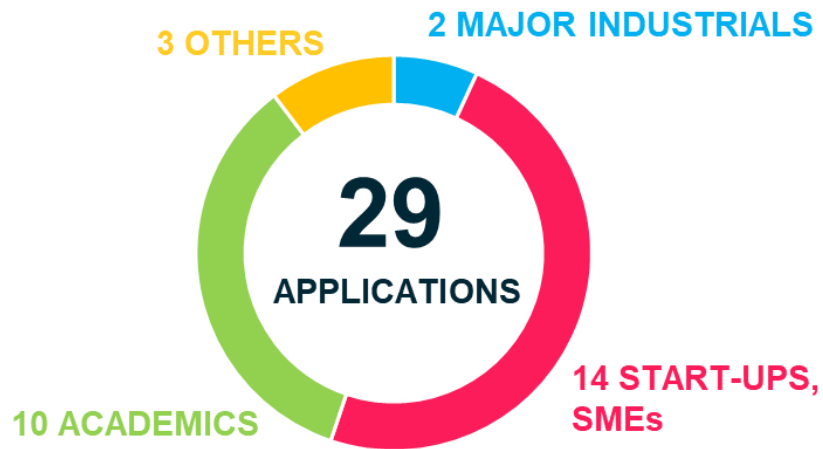
VACCINES



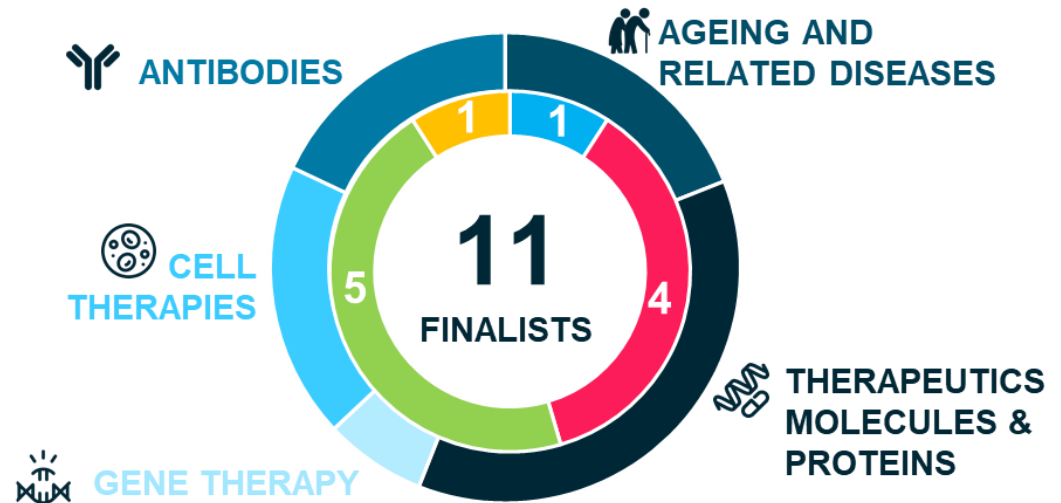
CELL THERAPIES

Selection of Project Portfolio

2 2022-2023 : CALL FOR PROJECTS AND SELECTION OF THE FIRST PROJECT PORTFOLIO



FROM 13 COUNTRIES



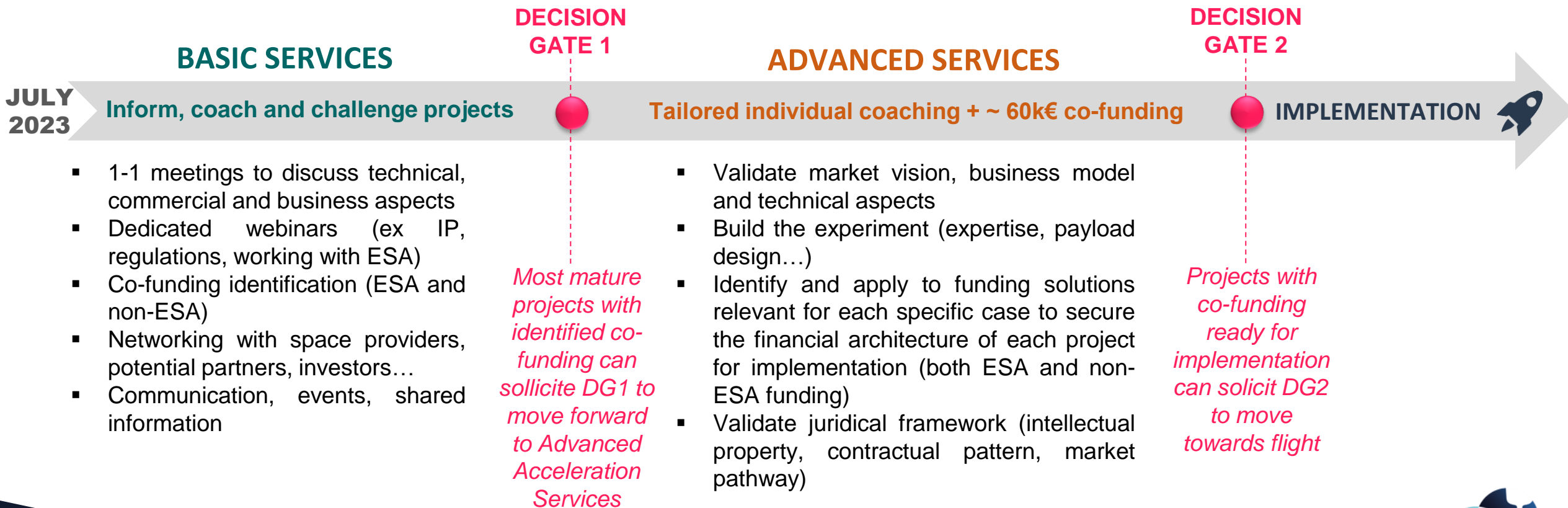
FROM 7 COUNTRIES



- Space background from the neophyte to the expert level
- Maturity of the project from the initial idea up to “ready for flight”

Current support of project portfolio

3 2023-2024 : PROJECTS MATURATION AND SUPPORT



Where are we now?

3

3 projects solicited DG1 in December 2023

They are granted ~ 60k€ to continue to develop the project and get ready for implementation with flights envisioned end of 2024 or beginning of 2025.



ZePRION II

Academic consortium led by the University of Milan Bicocca

TOPIC: Develop ground-breaking technology for Low-Earth-Orbit (LEO) structural characterization of non-native protein pharmacological targets. Drug discovery and optimization thanks to structural information about the crystallization of proteins in microgravity conditions.



SPACE ORGANOIDS

Start-up project from Prometheus Life Technologies

TOPIC: Standardized, large-scale commercial production of human organoids using the microgravity environment of space. Organoids to be used as models in preclinical drug testing or in general life sciences research and in regenerative medicine therapies



HORUS

Public-Private consortium led by the University of Grenoble Alpes

TOPIC: Develop a therapeutical response prediction and target deciphering using AI driven image analysis and extraction. Build a tumoroid-avatar mini-lab” to be used at the bedside and use microgravity as a therapeutic tool to combat solid stress in brain tumors

What is next?

- **Keep supporting the projects in our portfolio**
We are expecting more projects to solicit Decision Gate 1 in 2024
- **Have first projects fly as soon as possible to build success stories**
- **Identify a durable framework for the Accelerator for future calls and support**

THANK YOU FOR YOUR ATTENTION !