INTERNATIONAL SPACE STATION

European Columbus Module
408 km above Earth
MICROGRAVITY
GROUND-BREAKING RESEARCH

- Lack of buoyancy
- Lack of sedimentation
- Lack of phase separation
- Lack of hydrostatic pressure
- Containerless effect
DRIVER FOR INNOVATION

✓ Improve your own products & processes
to increase competitiveness, customer satisfaction and revenue

✓ Develop/manufacture new products
to increase market share, target new customer segments

✓ Develop new space-based service(s)
to secure growth options in an emerging market, serving customers
Agriculture and Food

- Crop science, management and monitoring
- Vertical farming / indoor agriculture
- Precision farming
- Cultured and plant-based meat
- Food product behaviour, shelf life
- Plant Nutrition and Health

**Increase Crop Yields**
**Produce More Tolerant Plants**
**Decrease Water Usage**
**Decrease Chemical Usage**
**Prevent Catastrophic Crop Losses**
**Decrease Land Use for Animal Farming**

Source: BSGN Life Science Accelerator by Space Cooperative Europe
Life Sciences, Health, Pharma

- Immune System
- Genetics
- Oncology
- Infectious diseases
- Respiratory diseases
- Vaccine Development
- 3D Tissue Engineering

**Drug Discovery**
**Drug Development**
**Drug Delivery**
**Biomanufacturing**

Source: BSGN Life Science Accelerator by MEDES
Materials and Manufacturing

- Structural composites for aerospace, automotive, wind turbines
- 3D printing
- High temperature thermoplastics for electronics
- High performance PCBs
- Chips
- Specialty glass
- Advanced photovoltaic

**Improving material processing technologies**

**Increasing productivity in assembly**

**Shortening R&D cycles for complex products**

- Novel polymers and fibers
- Advanced ceramics
- Superalloys
- Thin film systems and coatings
- Nanomaterials

Source: BSGN Advanced Materials Accelerator by Catapult
ICE CUBES SERVICE

From 50K €

1U (10x10x10)
M4PM PERSONALISED MEDICINE

Development of Personalized Medication and chemotherapeutic agents

Drug screening platform

✓ Easier formation of 3D cell cultures and 3D constructs than under gravity
✓ Increased size and quality of tumors, organoids and spheroids grown in space; less size variation
✓ Specific phenotypes relevant for in vitro disease modelling and development of personalized medicine which cannot be obtained under gravity
✓ Reduce necrotic cores
✓ 3D Tumors/Organoids/Spheroids grown in microgravity
✓ Research on 3D Tumors/Organoids/Spheroids growth

JOIN THE COMMUNITY
KIRARA PROTEIN CRYSTALLIZATION

Inside ICE CUBES
Investigates the potential effect of microgravity on the complex formation properties of Remdesivir and SBECI.

Better understanding of the remdesivir-SBECI formulation mechanism, which would allow to tailor the physico-chemical formulation process in order to reach elevated drug efficiency for COVID-19 treatment.
SPACE PHARMA

Inside ICE CUBES
Lab-on-chip technology
Axiom-1 RAKIA - **Cow cells orbit Earth for high steaks**

Aleph Farms will be looking into the **effects of microgravity on two basic processes responsible for muscle tissue formation**. These processes include proliferation and differentiation of cow cells into the building blocks of our steak.

Understanding processes in such an extreme environment like space, will allow Aleph Farms to eventually develop an **automated, closed-loop system that can produce steaks** during long-term space missions. Similarly to car manufacturers and Formula One, in **space the most efficient processes are being developed under the toughest environments**. The processes being validated in space can then be transferred to their **mainstream production on Earth to help increase efficiencies, and reduce environmental footprint**. Aleph Farms’ space program targets to help develop more sustainable and resilient food systems anywhere.

Source: [https://www.icecubesservice.com/journal/cow-cells-orbit-earth-for-high-steaks/](https://www.icecubesservice.com/journal/cow-cells-orbit-earth-for-high-steaks/)
BIOREACTOR EXPRESS SERVICE
Hybrid magnetic-polymeric nanoparticles for nano medicine and immune therapy.

Creating a nano-technology platform for the diagnosis and treatment of cancer and nervous system diseases. Using a combination of targeted and controlled drug delivery, hyperthermia and radiofrequency and laser imaging methods. Expected to lead to different products, including a contrast agent, drug formulation, a cell therapy system and a portable and integrated medical device to produce the cell therapy system.
Biomining is an environmentally friendly and energy efficient way of extracting useful elements by using microbes to break down rocks to make soil or provide nutrients. One major question is how these microbes attach to surfaces, or form biofilms, in space.

Watch full story: https://www.youtube.com/watch?v=wr6gNLPR0q8

Read more about Biomining and rare earth extraction in Nature https://www.nature.com/articles/s41467-020-19276-w
FEELING LOST?
FIND PARTNERS

Assemble the right team and selection of implementation partners to make your mission a success.

Use our search and filters to identify and contact partners.

From 2022 also financing, business, innovation, engineering and science partners.