EUROPEAN SPACE AGENCY

Internal Research Fellow (PostDoc) in Manned Spaceflight Facility for Cultivated Meat

Job Req ID: 10781
Closing Date: 30 May 2021
Publication: External Only
Vacancy Type: Internal Research Fellow
Date Posted: 30 April 2021

Research Fellowship Opportunity in the Directorate of Human & Robotic Exploration Programmes.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. For this purpose, we welcome applications from all qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, age, disability or other characteristics. Applications from women are encouraged.

This post is classified F2.

Location
ESTEC, Noordwijk, The Netherlands

Our team and mission
The Research Fellow will be based in the Columbus 2030 Engineering Team and work in collaboration with the Space Medicine Team.

Field(s) of activities/research
Future human exploration missions beyond Low-Earth Orbit will result in unprecedented constraints on the supply and re-supply of food to meet the energy requirements of the crew. For very long missions (with no opportunity to pre-deploy food depots or re-supply from Earth), it may be impractical or even impossible to launch and store all the food required with the crew, and alternative approaches will be required. In addition, before that time, as missions get longer, there may be a 'trade-off' point at which it may be optimal (from a mass/volume/resources perspective) to switch from launching food to a combination of launching food and in-flight production.

You will identify, investigate and evaluate present developments in the area of cultivated meat (meat produced by in vitro cell culture of animal cells, instead of from slaughtered animals), as well as its end-to-end processing value chain, including resources required and waste products generated.

You will, on the basis of expected exploration mission scenarios (mission duration, crew number and projected energy requirements to achieve energy balance), evaluate the feasibility of implementing present cultivated meat solutions and technologies. Compatibility of the solutions with the requirements and constraints of these missions will be evaluated and where incompatible, alternatives will be identified and evaluated. Likely ‘trade-off’ points will be identified on the basis of different mission scenarios. One of the key aspects to be considered in the project is that the processing of cultivated meat in space be a closed loop solution, whether as a stand-alone solution or in conjunction with other systems.

Key tasks include:
- Characterising crew nutritional needs in expected exploration mission scenarios;
- Assessing the implications of crew nutritional needs on launch mass and volume, on-board storage, and waste production and management;
- Identifying existing cultivated meat solutions, their technology readiness level and ongoing developments;
- Specifically, for an in-flight cultivated meat production facility:
- Defining key requirements for an in-flight bioreactor;
- Potential multi-use opportunities for a bioreactor, including the growth of human cells;
- Identifying potential solutions for 3D bioprinting of meat in microgravity and defining key requirements.
- Performing a trade-off of different cultivated meat solutions in terms of their capacity to meet crew nutritional needs, resources required and waste produced;
- Identifying an optimal solution or combination of solutions for expected exploration mission scenarios;
- Identifying 'trade-off' points for expected exploration mission scenarios, where including in-flight cultivated meat production may be operationally optimal to meet crew nutritional needs.

The RF assignment will conclude with a preliminary design of the solution and a clear understanding of the interfaces and services required from a host space habitat.

Interested candidates are highly encouraged to visit the ESA website: www.esa.int

Technical competencies
Knowledge relevant to the field of research
Research/publication record
Ability to conduct research autonomously
Breadth of exposure coming from past and/or current research/activities
General interest in space and space research
Ability to gather and share relevant information

Behavioural competencies
Innovation & Creativity
Continuous Learning
Communication
Relationship Management
Self Motivation
Problem Solving
Cross-Cultural Sensitivity

Education
You should have recently completed, or be close to completion of a PhD in a related technical or scientific discipline. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

Additional requirements
PhD or equivalent qualification in medical/cell tissue biology and/or space engineering.

Specificities
A working knowledge of human metabolism and nutritional requirements is desirable.

Other information
For behavioural competencies expected from ESA staff in general, please refer to the ESA Competency Framework.

The Agency may require applicants to undergo selection tests.

In addition to your CV and your motivation letter, please add your proposal of no more than 5 pages outlining your proposed research in the "additional documents" field of the "application information" section.
At the Agency we value diversity and we welcome people with disabilities. Whenever possible, we seek to accommodate individuals with disabilities by providing the necessary support at the workplace. The Human Resources Department can also provide assistance during the recruitment process. If you would like to discuss this further please contact us at contact.human.resources@esa.int.

Please note that applications are only considered from nationals of one of the following States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom. Nationals from Latvia and Slovenia, as Associate Member States, or Canada as a Cooperating State, can apply as well as those from Bulgaria, Cyprus, Lithuania and Slovakia as European Cooperating States (ECS).
Priority will first be given to candidates from under-represented Member States.

In accordance with the European Space Agency’s security procedures and as part of the selection process, successful candidates will be required to undergo basic screening before appointment