



The European Federation of Biotechnology (EFB) held the Biotechnology for *Extreme Environments Conference* online on 9 April 2025, with participants from 17 countries. The event showcased pioneering research at the intersection of biotechnology and extreme environmental conditions.

The one-day programme featured three focused sessions:

- **Biotechnology in Space** – life-support systems, photobioreactors, and plant cultivation for future space missions.
- **Drought, Heat, and Nutrient Deprivation** – innovations in crop resilience, microbial ecosystems, and mars biofertilization strategies.
- **Extreme Industrial Fermenters** – advances in thermophile engineering, enzyme stabilization, and sustainable bioethanol production.

BIOTECHNOLOGY in EXTREME ENVIRONMENTS

Biotechnology in Space and for Space
Drought, Heat and Global Warming
Stress in Industrial Fermenters

9 April 2025 | Virtual conference



Scientific programme

9 April 2025 (*all times in CET*)

Session 1: Biotechnology in space and for space

9:00 – 9:10	Introduction by the Chair Francesc Gòdia , EFB President
9:10 – 9:30	Keynote lecture: MELiSSA: micro-ecological life support system alternative. The European regenerative life support system for future human space exploration. Francesc Gòdia , Autonomous University of Barcelona (UAB), Spain
9:30 – 9:50	Invited lecture: Plant cultivation in bioregenerative life support systems for Space: state of the art and research challenges. Roberta Paradiso , University of Napoli II, Italy
9:50 – 10:02	Invited lecture: Developing photobioreactors for human spaceflight missions. Lina Salman , Technical University of Munich, Germany
10:02 – 10:22	Invited lecture: Life-support systems for space travel. Lucie Poulet , Clermont Auvergne University, France
10:22 – 10:37	Q&A
10:37 – 10:40	European Congress on Biotechnology ECB2026 announcement Francesc Gòdia , EFB President
10:40 – 11:30	<i>Break</i>

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Session 2: Drought, heat and nutrient deprivation

11:30 – 11:35 Introduction by the Chair

Pavel Dvořák, Masaryk University, Czech Republic

11:35 – 11:55 **Invited lecture:**

Cyanobacteria as candidates to support mars colonization: growth and biofertilization potential using Mars regolith as a resource.

Inês Efe Macário, Instituto Nacional de Técnica Aeroespacial (INTA),
Department of Planetology and Habitability, Spain

11:55 – 12:07 Plant cell biotechnologies for advanced bio-based production and space applications

Jenny Renaut, Luxembourg Institute of Science and Technology (LIST),
Luxembourg

12:07 – 12:27 **Invited lecture:**

Exploring genetic resources for barley drought resistance development

Veronique Bergounoux, Palacký University, Czech Republic

12:27 – 12:39 Bacterial diversity of marine biofilm communities in Terra Nova Bay (Antarctica) by culture-dependent and -independent approaches

Melissa Bisaccia, University of Insubria, Department of Biotechnology and Life Sciences (DBSV), Varese, Italy

12:39 – 12:51 Antimicrobial resistance in pristine northern Alaska Arctic lakes

Lorenzo Tonin, Department of Biotechnology and Life Sciences, University of Insubria, Varese, Italy

12:51 – 13:00 **Q&A**

13:00 – 14:20 *Break*

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Session 3: Extreme environments of industrial fermenters

14:20 – 14:25 Introduction by the Chair

Joanna Surmacz-Górska, Co-Chair of the EFB Environmental Biotechnology Division, Silesian University of Technology, Poland

14:25 – 14:45 **Keynote lecture:**

Pioneering the development of engineering tools for Gram-negative bioplastics-producing thermophiles

Pavel Dvořák, Masaryk University, Czech Republic

14:45 – 14:57 Enhancing the stability of lipase from *Geobacillus stearothermophilus* T6 in extreme pH conditions

Nitsan Yehishalom, Technion, Israel

14:57 – 15:17 **Keynote lecture:**

Biopolymer synthesis under extreme conditions

Stanislav Obruča, Brno University of Technology, Czech Republic

15:17 – 15:29 Sustainable bioethanol production by inhibitor tolerant yeast

Saini Jitendra Kumar, Central University of Haryana, India

15:29 – 15:49 **Invited lecture:**

TBA

Céline Vaneeckhaute, Laval University, Canada

15:49 – 16:00 **Q&A**