SEMINAR

# CELLULAR AGRICULTURE: CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE PROTEIN PRODUCTION

Thursday, December 11, 2025
1:00-2:30 PM
Room 10D, Politecnico di Torino

## CULTIVATED MEAT: RATIONALE AND STATE OF THE ART FROM A BIOTECHNOLOGICAL PERSPECTIVE

**Alessandro Bertero**
Associate Professor at the Department of Molecular Biotechnology and Health Sciences / Molecular Biotechnology Center "Guido Tarone"
**University of Turin**

## CLOSING THE LOOP: UPCYCLING AGRIFOOD SIDESTREAMS TO ENABLE CELL AGRICULTURE SCALE UP

**Bruna Anzà**
PhD student at the Department of Applied Science and Technology
**Politecnico di Torino**

## WHOLE-CUT CELL-CULTURED FISH FILLETS PRODUCTION BY CELLULAR AGRICULTURE STRATEGIES

**Diana M. C. Marques**
PhD student at the Department of Bioengineering at Instituto Superior Técnico (IST) / Institute for Bioengineering and Biosciences (iBB)
**University of Lisbon**

*Followed by a round table and open discussion moderated by* ***Diana Massai***

# ABSTRACTS & BIO

## CULTIVATED MEAT: RATIONALE AND STATE OF THE ART FROM A BIOTECHNOLOGICAL PERSPECTIVE

Cultivated meat is an emerging technology that aims to produce nutritious, safe, and environmentally sustainable animal protein to complement existing sources. At a production scale it entails the growth and differentiation of animal cells in a cultivator, a bioreactor developed specifically to this purpose, and the subsequent formulation into a food product, often in combination with plant-based ingredients. This part of the seminar will focus on the first step, specifically the types of cells that can be used as starting materials and the conditions in which they can be grown in an animal-free nutrient broth.

### Alessandro Bertero

A biotechnology researcher with international training in Turin, Cambridge, and Seattle, he has been an Associate Professor at the University of Turin since 2021 and leads the Harvard-Armenise “genomic architecture” laboratory.
His group uses precise genome-editing in stem cells to study cardiac diseases and create optimized cell lines for cultivated meat. He holds three patents in cellular agriculture, co-founded the U.S. cultivated-fish startup SoundEats, and contributed to Meatable’s technology.
He leads the Cult Meat crowdfunding project and the Compagnia di San Paolo Kolemus Launchpad grant, aimed at developing a business idea that was a finalist in the 2024 National Innovation Award. He collaborates with FEAT, the Interuniversity Center for Sustainable Food, and the Good Food Institute, and is active in public outreach.

https://www.berterolab.com/

## CLOSING THE LOOP: UPCYCLING AGRIFOOD SIDESTREAMS TO ENABLE CELL AGRICULTURE SCALE UP

Cultivated meat production faces significant economic and sustainability challenges, particularly the high costs and ethical concerns associated with conventional cell culture media components like fetal bovine serum. A promising solution lies in the valorization of agrifood industry sidestreams (e.g., underutilized byproducts from food processing) as functional ingredients for serum-free, plant-based culture media. This approach entails the systematic recovery of bioactive compounds through green chemistry extraction methods, including deep eutectic solvents and other sustainable techniques, followed by comprehensive physicochemical and biological characterization. The recovered components are then evaluated for their capacity to support cell growth and viability in culture systems relevant to cultivated meat production. This part of the seminar will focus on how these circular economy strategies can transform food industry waste into cost-effective media components, discussing the methodological frameworks employed for extraction optimization, compound characterization, and biological validation, while highlighting the potential of this approach to address both economic barriers and sustainability concerns in cellular agriculture.

### Bruna Anzà

Bruna is a PhD student in Chemical Engineering at Politecnico di Torino, specializing in sustainable cell culture media development through agrifood sidestream valorization and green chemistry methods, bridging circular economy principles with cultivated meat biotechnology.
Currently Scientific Consultant for The Good Food Institute Europe, she previously led teams in Germany focusing on insect farming sidestream upcycling for biomaterials.
Her laboratory expertise spans culturing induced bovine stem cells and fish cell lines, alongside advanced protein extraction and characterization.
As President and Co-founder of Kernel Science SRL, Bruna develops AI-powered tools to accelerate scientific discovery in food systems and beyond. She also serves as Vice-President of Cell Agriculture Italy APS, bridging cutting-edge science with public understanding of this transformative field.

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## WHOLE-CUT CELL-CULTURED FISH FILLETS PRODUCTION BY CELLULAR AGRICULTURE STRATEGIES

As the global population increases, the demand for animal products increases too. Production of meat is exhausting the use of fertile land and fresh water and contributes to greenhouse gas emissions. Intensive fishing is depleting the oceans; and aquaculture presents severe ecological impacts. Cellular agriculture has the potential to revolutionise food production, by generating more sustainable animal proteins in bioreactors using cell sources rather than farming and sacrificing entire animals. This part of the seminar will focus on the manufacturing of cultured fish products using cellular agriculture strategies based on cell culturing and scaffolding. These scaffolds support fish cell growth, provide adequate mechanical properties, and contribute to the final tissue nutritional and sensory features. These tissues were engineered using 3D bioprinting and electrospinning, allowing a precise deposition of different components to recreate in a high-level of detail a fish fillet, combining bioengineering and food technology.

### Diana M. C. Marques

Diana is an IST Bioengineering PhD student who has training in biotechnology and biochemistry. Diana developed the research of Algae2Fish, a project funded by the Good Food Institute (GFI), to produce edible scaffolds to fabricate seabass fish fillets using 3D bioprinting and electrospinning. In her PhD studies, she is also focused on scaffolding, electrical stimulation of fish cells, bioreactors, and fish cell culture. Diana holds one patent in the field and already contributed for publishing 8 articles and 2 chapters.
Diana is the co-founder of "The University of Lisbon Alt Protein Project," a GFI program that aims to promote education and opportunities for students and researchers on the alternative proteins field. She is also a co-founder member and the Executive Director of CellAgri Portugal. Recently, she joined the Sensory, Behavior and Cognition (SBC) Lab at Università di Scienze Gastronomiche di Pollenzo as a visiting PhD student.

https://www.cienciavitae.pt//en/F31E-E98B-1C0F