

Symposia | シンポジウムB

📅 Thu. Aug 28, 2025 9:00 AM - 11:40 AM JST | Thu. Aug 28, 2025 12:00 AM - 2:40 AM UTC 🏢 Room E(3F 131)

[SYB5] [B5] International Cooperation with Asian Academic Societies Towards Sustainable Future

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10:35 AM - 11:05 AM JST | 1:35 AM - 2:05 AM UTC

[SYB5-04] Towards a Blue Revolution: Collaborative Innovation in Sustainable Aquatic Cultured Meat – Introducing the Ministry of Oceans and Fisheries Consortium in Korea

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Keywords : Aquatic Cultured Meat、Blue Bioeconomy、Marine Cell Culture、Biomimetic Scaffolds、Digital Food Modeling

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Amidst escalating concerns over marine ecosystem degradation, climate change, and the unsustainable exploitation of wild fisheries, the global food sector is urgently seeking alternative protein sources that can ensure both nutritional security and environmental resilience. In response, the Republic of Korea has launched a large-scale national R&D initiative under the auspices of the Ministry of Oceans and Fisheries (MOF), aimed at pioneering the development of aquatic cultured meat. This effort forms a critical pillar of Korea's emerging blue bioeconomy strategy and is designed to future-proof the seafood supply chain.

This presentation introduces the MOF's flagship research consortium for aquatic cultured meat, which brings together a multidisciplinary team of leading academic institutions, biotechnology firms, and marine science experts. The consortium's mission is to establish a next-generation platform for the production of high-quality, sustainable fish- and shellfish-based cultivated foods. The initial target species include yellow grouper (*Epinephelus awoara*), oyster (*Crassostrea gigas*), scallop (*Patinopecten yessoensis*), and kuruma prawn (*Marsupenaeus japonicus*)—all of which are economically and culturally significant in the seafood market.

The consortium integrates advances in marine cell culture, biomimetic scaffold engineering, and AI-assisted food design to recreate the complex structure and sensory properties of real seafood. The following major technical achievements are expected: (1) successful immortalization of muscle and fat cell lines from the selected species; (2)

development of serum-free, marine-derived culture media that reduce both cost and environmental burden; (3) fabrication of edible scaffolds from marine collagen and seaweed hydrogels that mimic native extracellular matrices; and (4) development of a digital modeling platform to simulate the structural and textural transitions of cultivated seafood during processing and consumption.

This approach supports the creation of high-fidelity cultivated seafood products that closely resemble the texture and eating experience of conventional seafood, thereby improving consumer acceptance. The presentation will outline Korea's strategic vision and technical roadmap for scaling aquatic cultured meat technologies and emphasize the growing importance of international collaboration to drive a sustainable "blue revolution" in future food systems.