

## **Session: Shaping the Future of Personalized Nutrition: Evidence-Driven Science Meets Real-World Impact**

### **Beyond Traditional Proteins: Assessing the Bioaccessibility of Cultured Meat and Jellyfish as Emerging Proteins**

Environmental and health concerns catalyse efforts to mine for alternative proteins, such as cultured meat and aquaculture. However, their nutritional equivalence and physiological impact remain underexplored, particularly as it pertains to various individuals. This study utilizes *in vitro* digestion models to assess the potential digestive fate of these emerging alternatives.

First, we will describe a comparison of two cultured meat prototypes-one featuring muscle/fat microtissues (Type 1) and another incorporating an oleogel-based fat substitute (Type 2) and evaluation of the digestive trajectories using *in vitro* digestion model coupled to SDS-PAGE and LC-MS/MS proteomic analyses. This highlights cultured meat proteins exhibited breakdown patterns similar to beef, while peptide fingerprinting revealed that cultured prototypes retained a higher proportion of long peptides (>17 AAs). Furthermore, bioactive peptide yields were significantly higher in beef than in the cultured prototypes.

Secondly, we will describe an effort to explore the invasive jellyfish *Rhopilema nomadica* as a possible protein source, with 10.8% protein, mostly comprised of Type I collagen. Further, SDS-PAGE analyses of digestive effluents highlighted sex-dependent differential digestion kinetics, with slower gastric degradation observed under male gut conditions.

Thus, this talk will emphasize a current gap in nutritional bioequivalence between conventional and novel proteins, underscoring the necessity of to evaluate the digestive fate of innovative and alternative foods.