



Thursday 7 November 2024 @ Bio Base Europe Pilot Plant (Gent)

ENSURING SUSTAINABLE FOOD AND FEED SUPPLY FOR FUTURE GENERATIONS

Lecture

Where is the Cultivated Meat?

Prof. Dr. **Mark Post** (Maastricht University)

Since the start of scientific development of cultivated meat in 2005, major steps have been made to convert this medical technology into a food production process. Whereas some of the developments remain based on results and concepts derived from the far larger and better funded regenerative medicine research and pharmaceutical biotechnology, additional challenges force the cultivated meat society to pursue divergent routes.

The unimaginable scale of cell/tissue production and need for low-cost production are challenges of technical and logistic nature. Not only rigorous optimization of existing processes but also novel scientific development is required to overcome these challenges, such as finding new nutrient sources for cell culture. Growth of astronomical numbers of mammalian cells require extensive upstream and downstream bioprocess development and perhaps innovation in bioreactor design. In addition to massive cell expansion, the cells need to form tissue. This typically requires the temporary support by scaffolds made from edible biomaterials. To reduce the cost of production, feedstock that is traditionally pharma-grade will be exchanged for food-grade substitutes and possible protein hydrolysates.

Consumer related challenges of a more ethical nature are also different between medical and food applications. The need for animal-component free culture of cells and tissues, abstinence of antibiotics and, for some consumers, genetic modification limit the solution-space available to developers of cultivated meat and for materials needed. At the same time, consumers are increasingly willing to accept alternative sources of meat, giving the field an appreciable tailwind.

Given the huge potential for improvement and extension of applied tissue engineering for food, this will be an exciting scientific endeavor for the next couple of decades.



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Incorporating Circularity with Biomass Fermentation

Ir. Stijn Boeren (Avecom)

The agri-food sector and the industry at large generate significant amounts of co-products and residual side streams are often wasted. The burden of dealing with waste disposal, combined with the increased awareness of natural resource scarcity, have spurred the creation of circular solutions. Avecom develops biomass fermentation processes that involves the conversion of organic materials, such as agricultural or industrial side streams, by micro-organisms. This results in the production of valuable products such as proteins, biopolymers, and organic fertilizers.



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Agrochemical Discovery for a Sustainable Agriculture: the Case of a Chemical Genetics-based Nitrification Inhibitor Screen

Ir. **Peter Jaeken** (Belfertil) and Dr. Ir. **Hans Motte** (VIB/UGent)

This talk will focus on chemical genetics to study biological processes and identify novel agrochemicals. After introducing the principles of chemical genetics, a case study on the discovery of novel nitrification inhibitors will be presented. These inhibitors reduce microbial ammonia oxidation, thereby decreasing fertilizer requirements, minimizing fertilizer loss, and lowering greenhouse gas emissions from agriculture, contributing to more sustainable food and feed production. We will discuss the development of bio-assays using ammonia-oxidizing microorganisms, which enabled the screening of 50,000 small molecules to identify new nitrification inhibitors, and the process of refining initial hits into commercially viable products. This study illustrates the transformative potential of chemical genetics research in advancing sustainable agricultural practices and ensuring food security.