

Press Release, 23 June 2022

Proteins from microbial fermentation get boost with The Proteinn Club

*In Ghent, an innovation platform has been christened that will advance a fairly new (f)actor in the food landscape and the broader bioeconomy, namely proteins made through fermentation-based production processes. **'The Proteinn Club'** is the name; the 'inn' refers to innovation. Knowledge centers Ghent University (UGent), CAPTURE, ILVO and the pilot facility Bio Base Europe Pilot Plant (BBEPP) are the proud parents.*

The ambition is to achieve a significant sustainability gain in the world of proteins, by accelerating the realization of new value chains on an industrial scale, based on research and development. 27 companies are already showing serious interest. The Flemish government, the province of East Flanders and the City of Ghent (through the Ghent Economic Board) are all enthusiastically supporting the initiative.

Microbial protein? Time is ripe for versatile possibilities

Traditional fermentation-based products have existed for years: beer, baker's yeast, vinegar, biogas, etc. The production of proteins using microbial fermentation has only recently gained worldwide interest. Due to current challenges such as climate change, nitrogen problems, more economical use of space and water, food security, etc., people worldwide are looking for various alternatives, in addition to the traditional protein sources. A precisely tuned bioreactor is central to the microbial protein production process. In it, you can efficiently and in a controlled way convert industrial by-products or residual flows from the agro and food sectors into high-quality proteins. These can then be used in a variety of applications in food, animal feed and fine chemicals. Connections must be made in order to close the chain from raw material to finished product. This requires time, energy, knowledge sharing, innovation... In short, a smart, accelerating platform.

Ecosystem around Ghent

In the region around Ghent, a remarkable ecosystem of companies, research centers and pilot facilities working with fermentation-based proteins has been developing for some time now. There is the Bio Base Europe Pilot Plant in the Port of Ghent and the Food Pilot of Flanders'FOOD and ILVO in Melle. **Prof. Wim Soetaert**, CEO of BBEPP: "In our pilot and demonstration facilities in Ghent, we are equipped to scale up the production of fermentation-based proteins. It goes from lab scale to 75,000 liters industrial scale. Biomass fermentation means that the microorganism itself is harvested, because it is rich in protein (e.g. 'Quorn' meat substitute). In precision fermentation, the microorganism itself is a factory for a specific protein (e.g., a milk protein, collagen or myoglobin, a meat protein)."

One of the possible waste streams which the producing single-cell organisms can convert, is CO₂, a residual product that poses a major challenge for companies in North Sea Port. **Stijn Ronse** (ceo CAPTURE): "We look at circular issues from a value chain perspective from raw material to product. In the ecosystem of The Proteinn Club, that approach fits perfectly."

Building a value chain around microbial proteins is more efficient if there is also applied research available on the final processing and valorization of the residual flows. **Dr. Lieve Herman**, ILVO department head and CEO Food Pilot Melle: "Processing companies can only start working with an alternative protein source when they have mastered the characteristics and behavior of the ingredient (taste, binding power, texture, shelf life...). ILVO in Melle is specialized in

that respect. Together with Flanders' FOOD has invested in the necessary pilot equipment for food and feed applications."

Ambitious to-do list

In addition to scaling valuable technology from the lab to industrial demonstrations, The ProteInn Club is aiming to facilitate real, close economic and environmental value chains. "That means bringing companies from different sectors together in projects in a fragmented and sector-driven innovation landscape. And removing barriers to collaboration or symbioses. The ecosystem around the founders of the club thus consists, in addition to large companies, SMEs and start-ups, of governments, consumers and investors," says **Simon De Corte** (UGent).

Based on these actions, The ProteInn Club promises an accelerated development and rollout. "We want to play on the existing strengths to realize a specialized knowledge, expertise and business cluster at world level, with calculated and monitored ecological footprints and environmental impact."

Governments recognize sustainability, climate and circularity

Sustainability is the driving force behind innovations with fermentation-based protein products. The production process offers much higher conversion efficiency (from low-value, abundant raw materials to high-value components), and compared to other protein production systems, it reduces greenhouse gas emissions, water use, space intake, and the need for protein imports (for feed). Microbial protein production therefore contributes to a circular and bio-based economy.

Jo Brouns (Flemish Minister of Economy, Innovation and Agriculture): "Our Flemish protein strategy also mentions microbial protein as one of the development paths to be explored. As a government, we therefore support this platform that connects scientific knowledge with industry and with the ambition to become more sustainable. It also fits perfectly within the ambitions of the Flemish bio-economy policy plan to start converting biomass into new products, in order to also become more independent from external inputs." The city of Ghent and the province of East Flanders also got on board with the club based on the expected ecological, economic and social added value.

Industry immediately shows great interest

In the meantime, [27 companies](#) in the region expressed their interest, involvement and some also experience in microbial fermentation. After a first exploratory round of discussions, they decided to join an industrial sounding board of The ProteInn Club. The 27 include companies from classic food and feed production, companies looking for solutions for their residual streams, technology- and machine builders, and companies active in biomass processing up to and including retail. The first collective thematic discussions showed how necessary it is to connect very diverse things: the various product streams, infrastructure, raw materials, suppliers of microbial strains, developers of fermentation processes and technologies, processors of 'harvested' material, producers of finished food, feed cosmetics and chemicals, and distributors. The ProteInn Club picks this up at once, and assists them from the growth of ideas to the concept phase (TRL 1), through the pilot and demo phases, to the final implementation phase (TRL 9).

Conclusion

Few regions in the world have the potential in terms of microbial fermentation as the region around Ghent currently does. "There is a strong economic signal here," says East Flanders Deputy for Economy **An Vervliet**, "The complementarity and strong collaboration between the knowledge partners UGent, CAPTURE, ILVO and pilot facility BBEP are striking. Their expertise, research and upscaling infrastructure and network span the entire value chain of activities, as well as the various steps of the development process. The ProteInn Club is immediately up and running, with contacts, project ideas, technical advice. Are you a company, government or organization that wants to explore its possible role in the described protein value chain? Find us via the brand new website <https://theproteinclub.eu/>

Photos: [here](#)

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Boilerplate

Bio Base Europe Pilot Plant (BBEPP) is an independent multifunctional pilot facility specifically dedicated to the process development, scale-up and pilot production of bio-based products and processes. BBEPP was founded in 2008 and is based in Ghent, Belgium. It is a service provider that has developed into the global reference for the scale-up of bio-based innovations and currently employs more than 140 people. www.bbeu.org.

ILVO/Food Pilot. ILVO is the largest independent Institute for Agricultural, Fisheries and Food Research in Belgium. Under the authority of the Flemish government, nearly 700 employees work on knowledge development around the societal challenges related to food and bio-based processes. ILVO is strong in co-creation, with companies and other external partners. The operation of the Food Pilot is a good example of this. More at www.ilvo.vlaanderen.be.

CAPTURE is a strategic partnership between Ghent University, Antwerp University, VUB and VITO on the reuse of raw materials. The focus is on the reuse of water, CO₂ and plastics. CAPTURE researchers develop processes for the production of microbial protein from wastewater and CO₂-based raw materials. Collaboration and value chain thinking are key principles of CAPTURE to come to integrated solutions for reuse. <https://capture-resources.be/>

Ghent University (UGent) does excellent fundamental and applied research on different aspects in the value chain of fermentation-based proteins. Synthetic biology, microbial technology, chemical process technology, aquaculture and food technology are some of the fields in which UGent plays a pioneering role worldwide. UGent wants to actively participate in building knowledge-based ecosystems in its environment. www.ugent.be

