FoodBioSystems DTP - PhD Project Advertisement

Project title:
FBS2021-21-Charalampopoulos: Multifunctional microfibrillated cellulosic material (Curran®) for low fat and low sugar reformulated foods

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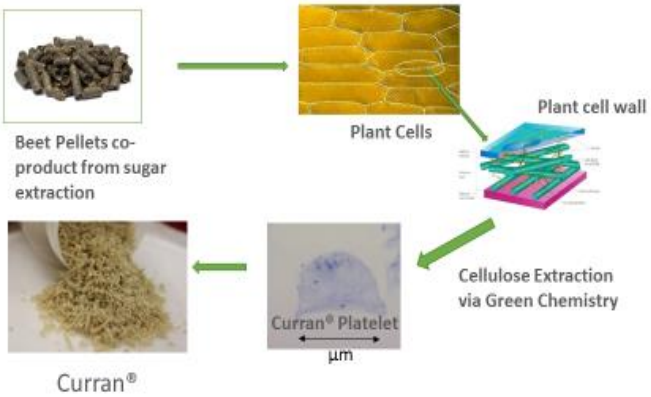
Project description:
This project is a great opportunity to be part of a multidisciplinary team from industry and academia. In this project you will investigate Curran®, a potential new food ingredient produced by our industrial partner CelluComp Ltd. Curran® is a microfibrillated cellulosic type material (MFC) extracted from sugar beet pulp. Your aims will be to:

1. Develop a fundamental understanding of Curran®'s chemical structure and physicochemical properties
2. Maximise its impact as a multi-functional ingredient in reformulated (low fat/sugar) food products.
3. Evaluate the sensory acceptability of the reformulated product by understanding how it is perceived and manipulated during mastication
4. Evaluate *in vitro* the digestibility and potential prebiotic activity of Curran® (solely and in foods) during passage through the stomach, small intestine and large intestine.



Research has shown that fibre-rich foods can have important physiological effects such as delaying the uptake of simple sugars and cholesterol, yielding a slower increase in blood sugar or low glycemic index (GI). Depending on their composition and structures, fibres can also function as fat and sugar replacers and their use in low fat/sugar foods can support the UK Government's drive to reduce obesity, diabetes and cardiovascular diseases. Moreover, fibres can resist digestion in the human small intestine and may be selectively fermented by bacteria in the colon. This fermentation may lead to beneficial changes in the number and composition of the gut microbiota, and to the production of short chain fatty acids, which are thought to play a key role in immune function and protect against inflammation.

There is a clear need and considerable market opportunity for fibres that have multiple functionalities within food

products, i.e. as rheology modifiers, bulking materials, emulsifiers, fat mimics, sugar replacers, and prebiotics. So, this is an exciting opportunity to work with industry to develop more sustainable, healthy and palatable ingredients.

Training opportunities:
The project represents an ideal opportunity for the PhD student to develop inter-disciplinary skills in carbohydrate analysis, food science and formulation, rheology, microscopy, oral processing, in vitro digestibility systems, and gut microbiology.

The project will include a 3-month placement at CelluComp, which will expose the PhD student to a dynamic technology-driven SME business environment. The PhD student will work closely with experienced entrepreneurs and improve his/her employability skills through regular interaction.

Student profile:
This project would be suitable for students with experience in food science, food processing, food processing, chemical/biochemical engineering, chemistry, polymer science or a closely related subject.
The Partner Universities are committed to having and providing a diverse and inclusive environment, support the gender equality Athena SWAN Charter and the Race Equality Charter, and are Diversity Champions for Stonewall, the leading LGBT+ rights organization.

Funding particulars:
The 4-year CASE studentship, in collaboration with CelluComp Ltd and is part of the FoodBioSystems BBSRC Doctoral Training Partnership (DTP), it will be funded subject to a competition to identify the strongest applicants.
The studentship is open to UK and international students (including EU countries) however due to funding rules, no more than 30% of the projects can be allocated to international students.
The funding will include a tax free stipend (minimum £15, 285 per year), support for tuition fees at the standard UK rate (currently £4,407 per year) and a contribution towards research costs. **Please note** that the host universities have not yet confirmed the level of fees charged to international students funded by the DTP. Fee levels may vary across the institutions. This information will be shared on the FoodBioSystems DTP website as soon as it becomes available.

To apply
Please go to FoodBioSystems DTP website for information on how to apply for this studentship. The closing date for applications will be 8 February 2021.