

FoodBioSystems DTP - PhD Project Advertisement

Project title:

FBS2021-07-Wijeyesekera: Investigating the effect of a seaweed-derived common food ingredient (carrageenan) on the human gut microbiome

Lead supervisor:

Dr Anisha Wijeyesekera, Department of Food and Nutritional Sciences, University of Reading

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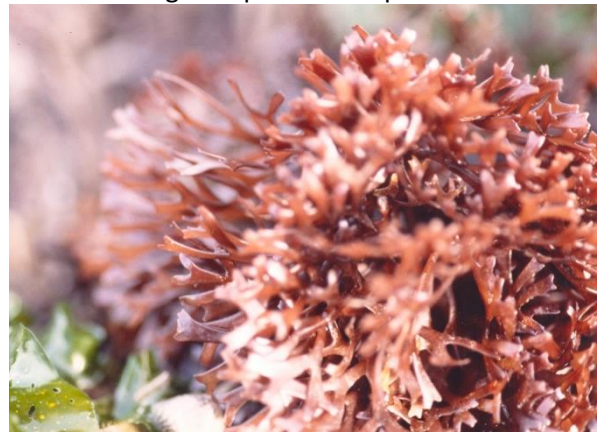
Co-supervisors:

Dr Jessica Adams, Institute of Biological, Environmental and Rural Sciences, Aberystwyth University

Dr Paul Smith, Cargill Inc.

Project description:

Carrageenan is a seaweed extract used extensively in prepared food including dairy, bakery and meat products. It is growing in popularity as a common food ingredient, however some negative press has reported an association with negative gastrointestinal effects. Seaweed and their extracts in general are considered beneficial to the human diet as they are rich in nutrients and have been associated with positive health outcomes. Hence, there is need to better understand the impact of carrageenan consumption on gut and overall health.



The gut is home to a complex community of microorganisms (gut microbiome) which supports the host in terms of digestion and breaking down dietary components, synthesis of vitamins, generation of microbial metabolites and playing an important role in maintaining immune health by protecting against invading pathogens. Research has demonstrated that alterations to the gut microbiome can impact on host health (both positively and negatively). We hypothesise that carrageenan will alter the diversity and relative distribution of microbial populations, and that this change in composition may result in alteration of microbial activity, which has the potential to impact on human health.

This PhD project spanning the entire Food System, entails a cross-disciplinary approach to better understand the impact of carrageenan on the human gut microbiome. Applying the knowledge and expertise of the two academic supervisors and industrial supervisor (Cargill), it will involve cutting edge techniques such as seaweed extraction, *in vitro* microbiological studies (including setting up and running laboratory models of the human gut), producing a carrageenan-containing food product at scale, running a human dietary trial followed by a multi-omics (microbiomics and metabolomics) analytical approach to characterise the change in microbial and metabolic profile following carrageenan consumption.

Training opportunities:

This DTP combines specialist seaweed and microbiological knowledge with expertise in gut microbiology and metabolic profiling, and a multi-national industry; with training opportunities available from all partners within these areas. At the University of Reading, the student will learn techniques relevant to studying the gut microbiota (gut models, microbial and metabolic profiling) and will gain experience in conducting a human dietary trial. Short placements will be spent at Aberystwyth University to learn the seaweed extraction and microbiological techniques. A 3-month placement with Cargill at their international food R&D centre in Brussels or Manchester will provide opportunities to explore international industrial research projects, and to produce food samples at scale.

Student profile:

We seek a highly motivated, ambitious student with an interest in cross-disciplinary research relating to Food Systems. Training in all techniques will be provided, but an ability and desire to learn new skills quickly would be advantageous. This project would be suitable for students with a degree in biology, chemistry, nutrition, agriculture, food science or a closely related subject. Applicants from minority backgrounds or with disabilities are particularly welcome to apply; those with issues surrounding relocation please contact Dr Wijeyesekera to discuss.

Funding particulars:

This is a Collaborative Awards in Science and Engineering (CASE) Studentship. The PhD includes a 3-month placement with Cargill. The student will receive a stipend during this placement to cover accommodation and travel costs.

The project 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.