FoodBioSystems DTP - PhD Project Advertisement

Project title:

FBS2021-08-Gibson: A human intervention study using Human Milk Oligosaccharides (HMOs) to improve Irritable Bowel Syndrome (IBS) symptoms through targeting of the gut microbiota

Lead supervisor:
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Dr Denise Robertson, Department of Nutritional Sciences, University of Surrey
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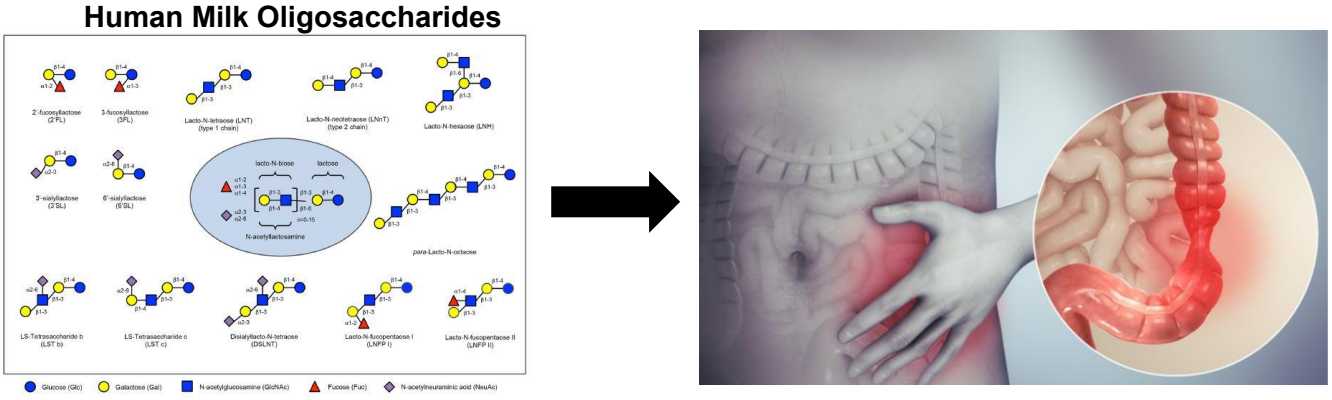
Project description:
Irritable Bowel Syndrome (IBS) is the most common gastrointestinal disorder in the UK and a major public health/economic concern. It is associated with a range of mental and physical symptoms and discomforts, however despite extensive research, the psychological and physiological factors that contribute to the aetiology of IBS remain poorly understood.

The human gut is inhabited by trillions of commensal bacteria that are known to impact on human health and disease. Prebiotic and probiotic supplementations have been shown to be effective in improving mental health, gut issues and quality of life in IBS, which demonstrate the impact of gut microbiota targeted dietary interventions in improving health outcomes. Human Milk Oligosaccharides (HMOs) are complex carbohydrates found in human breast milk that specifically stimulate bifidobacteria (a health positive genus). Given their health promoting potential, HMOs are of growing interest to the research community particularly in adult-onset conditions such as IBS, where other therapeutic approaches have been variable. We have conducted recent research showing that HMOs are highly efficacious prebiotics, and we hypothesise that dietary interventions such as HMOs have the potential to improve symptoms in IBS patients.



This PhD project entails a cross-disciplinary approach to better understand the impact of HMO intervention in IBS patients. It will involve both *in vitro* and *in vivo* approaches to assess the influence of the dietary intervention on the gut microbiota, and subsequent impact on human health. It will apply cutting edge

technologies (metabolic and microbial profiling) followed by multivariate statistical analysis to characterise the change in microbial and metabolic profile following HMO intervention, and improve knowledge of microbes as well as biomarkers/molecular pathways involved in changes to health status.

Training opportunities:
This DTP combines expertise in diet and nutrition (University of Surrey) with gut microbiology and molecular phenotyping (University of Reading) and a multi-national industry (Nestle Research); with training opportunities available from all partners within these areas. At the University of Surrey the student will learn thematic analysis techniques in order to gain insight into key issues in IBS, from structured interviews and questionnaire responses. At the University of Reading, the student will learn techniques relevant to studying the gut microbiota (*in vitro* gut models, microbial and metabolic profiling) and will gain experience in conducting a human trial at both Institutions. During the placement at Nestlé Research, the student will gain experience in industrial research in the Gastrointestinal Health department, will be exposed to the food industry research pipeline and be part of the translation of research from bench to product development during this project. Furthermore, the student will also benefit from clinical input from clinical colleagues and collaborators.

Student profile:
We seek a highly motivated, ambitious student with an interest in cross-disciplinary research approaches to better understand the impact of gut microbiota targeted dietary interventions on health. 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.

Funding particulars:
This is a Collaborative Awards in Science and Engineering (CASE) Studentship. The PhD includes a 3-month placement with Nestle Research (Lausanne). 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.