FoodBioSystems DTP - PhD Project Advertisement Text

Project Title: FOODBIOSYSTEMS - Diet and Chronic Disease: mechanistic studies on the impact of dietary protein on gut barrier function and the microbiota.

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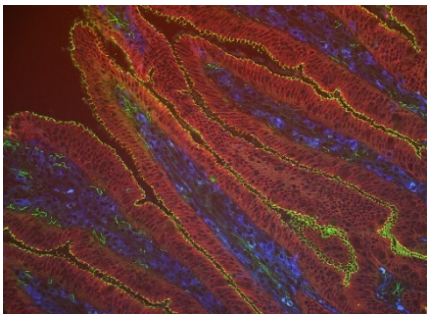
Research Group: FOODBIOSYSTEMS BBSRC DTP
Project ID: FBS2020-55

Application Deadline: 6 March 2020

Project Description: The gut microbiota is increasingly being linked to various chronic diseases including cardiovascular and liver disease. Currently, recommendations are to increase dietary protein, but we do not yet know what effect this will have on long term health. Some dietary protein is undigested and ends up in the colon where it is utilized by some gut bacteria and this can skew the microbiota. This altered microbiota interacts with host immunity and metabolism differently to one which is not fed by excess protein in the diet.

We have previously shown that increased dietary protein could be an important factor in the development of 'leaky gut' syndrome where the intestinal barrier does not work as it should. This means that various molecules from food and bacteria cross over into the blood stream and generate low-level immune responses. It is this low-grade inflammation which is known to contribute to later chronic disease.

We also know that female and male guts, immunity, metabolism and microbiotas are very different which suggests they could respond very differently to excess dietary protein. This has important implications when it comes to the development of interventions to reduce leaky gut and therefore later chronic disease.



This PhD will explore this in more detail using a piglet model, and determine the mechanisms involved using cutting-edge microbiota composition, metabolic profiling and immunological technologies.

Funding Notes: This project is part of the FoodBioSystems BBSRC Doctoral Training Partnership (DTP), it will be funded subject to a competition to identify the strongest applicants. Due to restrictions on the funding, this studentship is only open to UK students and EU students who have lived in the UK for the past three years.

This is a case studentship co-funded by Feed and Food Innovations Ltd.

The FoodBioSystems DTP is a collaboration between the University of Reading, Cranfield University, Queen's University Belfast, Aberystwyth University, Surrey University and Brunel University London. Our vision is to develop the next generation of highly skilled UK Agri-Food bioscientists with expertise spanning the entire food value chain. We have over 60 Associate and Affiliate partners. To find out more about us and the training programme we offer all our postgraduate researchers please visit https://research.reading.ac.uk/foodbiosystems/.

Training opportunities: Specific training will be provided in highly transferable analytic techniques including:

- Microscopy (4-colour quantitative immunofluorescence microscopy)
- Microbiota population analysis (high throughput sequencing, fluorescent in situ hybridization coupled with flow cytometry).
- in vitro gut modelling
- Metabolic profiling (NMR spectroscopy, gas chromatography/mass spectroscopy)

The industrial partner (Feed and Food innovations) will provide hands-on training in employability skills with a specific focus on working in business and industry.

Since this is a paired PhD project with the University of Surrey, there will be additional valuable opportunities for gaining expertise in human intervention trials.

Student profile: Due to the multidisciplinary nature of this program, we would not expect the successful candidate to have knowledge and experience in all relevant areas. However, we would expect the student appointed to have a background in immunology, metabolism, microbiology nutrition and/or gut health (or other appropriate subject) preferably, but not necessarily, to MSc level. Full support and training will be provided by experienced staff.

References:

https://www.frontiersin.org/articles/10.3389/fimmu.2019.02705/full