# FoodBioSystems DTP - PhD Project Advertisement

**Project title:**

FBS2021-33-Adams: Film of the Future – Producing an antiviral, antimicrobial, biodegradable plastic from seaweed

**Lead supervisor:** Dr Jessica Adams, Aberystwyth University, Institute of Biological, Environmental and Rural Sciences (IBERS)

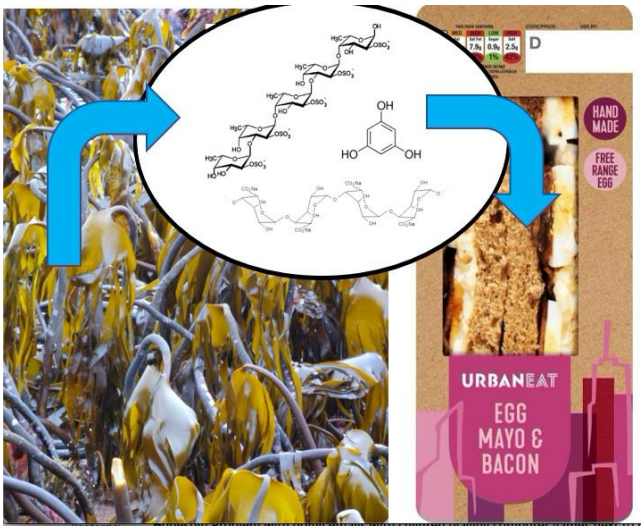
**Email:**
jaa@aber.ac.uk

**Co-supervisors:**
Dr Natalia Falagán, Cranfield University, Soil and Agrifood Institute
Dr Kerry Whiteside, Samworth Brothers Ltd

**Project description:**

This project tackles two major current issues: a reduction of single-use plastics used in society, especially non-degradable plastics; and a reduction in the transmission of COVID-19; here specifically through plastic food packaging . Working in conjunction with Samworth Brothers, a prepared-food company which typically produces 12 million sandwiches a week, this project will create a seaweed-derived plastic film which is not only biodegradable but also has antiviral and antimicrobial properties for use in future sandwich packaging. The project will include a 3-month placement with the company and an extra £2,000 per year stipend uplift.

Seaweeds contain a number of compounds and chemicals not found in land-based plants, with some known to have antiviral and antibacterial properties in addition to other health benefits. Despite this, research into seaweed extracts are lagging significantly behind research on land-based crops and there is still a lot of exciting science still to be done in this area. The project will be based at Aberystwyth University and will start by extracting compounds from a range of native seaweeds. The compounds will be assessed for their antiviral and antibacterial properties, then combined with alginate, another seaweed extract known to form a film since the 1940s, and additional compounds to make the film insoluble and strong. In first year the student will also spend three months with the project sponsors, Samworth Brothers, at their sites within Leicestershire and Cornwall. Here they will learn about the packaging process, from production to current disposal processes; gaining an insight into both logistics of large-scale production facilities and the parameters required for novel films.




In the second year, films will be tested at the second supervisor's institute, Cranfield University, for properties such as gas permeability and stability. Taking data from all sources, improved films will be created, with their antiviral

and antibacterial properties measured under a range of conditions. The optimal film will be produced at scale in the third year, using facilities within Aberystwyth's new innovation campus, and used in a trial packaging run with Samworth Brothers.

This DTP studentship will both provide the successful applicant with transferable skills and knowledge relating to future sustainable packaging solutions. The results of this project will contribute to research, industry and society, benefiting food security and global sustainability.

**Training opportunities:**

This DTP studentship will provide a solid grounding in understanding the food packaging system process, from the production and testing of raw and processed materials through to its utilisation in a packaging product. This will provide the successful candidate with multiple job suitability in both industry and academia upon completion of the PhD. Based at Aberystwyth, the student will have access to extensive equipment and knowledge, both belonging to the University and to the Innovation campus where scale-up work will be conducted in year 3. Through the DTP they would be expected to select and complete a number of post-graduate courses at Aberystwyth; they would also be eligible to attend relevant lectures and modules at Aberystwyth and Cranfield on topics from seaweed processing to food systems and management. The 3-month placement with Samworth Brothers will provide an invaluable insight into industrial requirements and logistics, setting up the candidate with knowledge and skills for the packaging product trial in year 3. The candidate would also regularly visit Cranfield with focused time dedicated there in the second year. Emphasis in this DTP will be on exposing the candidate to information surrounding this topic area, with money allocated to attend at least two international conferences including the triannual International Seaweed Symposium within the fourth year.

**Student profile:**
This project would be suitable for a broad range of applicants including those with a degree in biology, chemistry, food science or related subject area. Having an MSc or previous work experience in a relevant subject area is desirable but not essential. Applicants from minority backgrounds or with disabilities are particularly welcome to apply; those with issues surrounding relocation please contact Dr Adams to discuss. We are looking for a self-starter, a motivated researcher who is interested in both the underlying science and the industrial application.

**Funding particulars:**
This is a four-year CASE-funded PhD position with living costs during the industrial placement met and a £2,000 a year uplift from Samworth Brothers.
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.