

## PhD Project Advertisement

**Project title:** *Validating circulating biomarkers for liver fluke diagnostics*

**Project No:** FBS25-82-McVeigh-qa

**Lead supervisor:** Dr Paul McVeigh, School of Biological Sciences, Queen's University Belfast

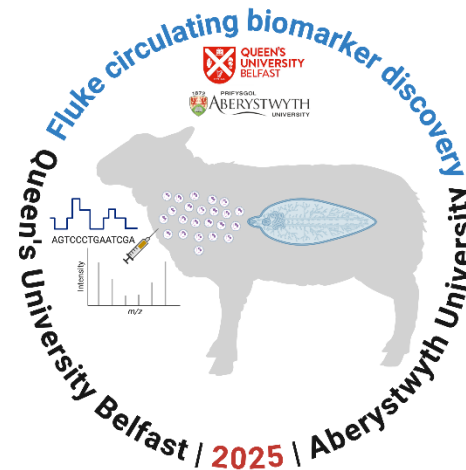
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**Co-supervisors:**

Dr Russ Morphey, Department of Life Sciences, Aberystwyth University

Professor Aaron Maule, School of Biological Sciences, Queen's University Belfast

**Project description:** The helminth parasite *Fasciola hepatica* (liver fluke) is a widespread economic and welfare threat on sheep and cattle farms, and a zoonotic threat to human health in some parts of the world. A vaccine is not available, so liver fluke infections are controlled by treatment with anthelmintic drugs, and pasture management to reduce infection risk. Anthelmintic resistance in worm populations, and consumer demand for organic animal products, drive the need to reduce anthelmintic use away from whole-herd approaches towards selectively targeted treatments. Available diagnostic tests cannot support these desired approaches, meaning that we need to discover new biomarkers capable of detecting and quantifying the impacts of infection on animal production. This project will build on data generated by a previously completed FoodBioSystems project with the aim of validating and testing a set of potential serum microRNA and protein markers for their ability to detect and quantify fluke infections in sheep. The project will employ RNA-Seq and mass spectrometry methods to detect markers in sera from infected sheep, as well as targeted proteomics, quantitative PCR and digital PCR to validate those markers in additional samples. The student will be primarily based in McVeigh's lab in Queen's University Belfast's School of Biological Sciences, with placement periods spent in Morphey's lab at Aberystwyth University's Department of Life Sciences. Molecular, RNA and bioinformatics work will be conducted in Belfast, mass spectrometry and proteomics in Aberystwyth, although there can be flexibility in this around student preference. The project will work towards testing a set of markers in samples collected from naturally infected sheep from farms in Wales and Northern Ireland, which could form the basis for development of an on-farm diagnostic test.



**Training opportunities:** Core, project-specific experimental methods: Wet lab molecular biology (QUB/AU), RNA-Seq (QUB), proteomics and mass spectrometry (AU), coding in bash/unix and R (QUB). On-farm sample collection: Through the Wales Veterinary Surveillance centre, student will help to collect necessary animal samples and engage in knowledge exchange with farmers. Science communication: Student will engage stakeholders in deciding how we can best develop our biomarker research towards a useable diagnostic test, through the following channels:

- I. National Agricultural Shows: Our departments exhibit annually at the Balmoral Agricultural Show (QUB) and the Royal Welsh Agricultural Show (AU).
- II. National Farmers' Unions: Through the Ulster Farmers' Union (UFU) and the Farmers' Union of Wales (FUW), we will engage directly with local sheep farming communities.
- III. STEMnet: The STEMnet program will allow us to communicate our work to 11-18 year olds, through which we hope to inspire the next generation of farmers, veterinarians and scientists.

**Project supervision style:** The student will be primarily based in PM's lab, where PM and the student will hold a weekly one-on-one meeting, in addition to a monthly lab meeting with the wider team. PM runs an open-door policy, so he meets most students more often than once a week. PM and the student will arrange additional monthly meetings with RM via MS Teams. Students can expect feedback on work usually within a week of submission, but in busier periods this may take up to three weeks.

**Student profile:** Demonstrable previous experience of laboratory molecular biology methods, and/or bioinformatics coding are advantageous, but not essential.

**Stipend (Salary):**

FoodBioSystems DTP students receive an annual tax free stipend (salary) that is paid in instalments throughout the year. For 2024/25 this is £19,237 and it will increase slightly each year at rate set by UKRI.

**Equity Diversity and Inclusion:**

The FoodBioSystems DTP is committed to equity, diversity and inclusion (EDI), to building a doctoral researcher(DR) and staff body that reflects the diversity of society, and to encourage applications from under-represented and disadvantaged groups. Our actions to promote diversity and inclusion are detailed on the [FoodBioSystems DTP website](#) and include:

- Offering reasonable adjustments at interview for shortlisted candidates who have disclosed a disability or specific learning difference.
- [Guaranteed interview](#) and [applicant mentoring](#) schemes for applicants, with UK home fees status, from eligible under-represented ethnic groups.

These are opt-in processes.

Our studentships are offered on a part time basis in addition to full time registration. The minimum registration is 50% FT and the studentship end date will be extended to reflect the part-time registration.

**The closing date is 3 February 2025 (10.00 GMT). Please visit the [FoodBioSystems website](#) to access the [2025 cohort applicant guidance document](#); and for up to-date information on how to apply, eligibility, studentship rates, and part time registration.**