PhD Project Advertisement

Project title: Anthocyanins, Microbiome and Healthy Aging
Project No: FBS2023-25-Hunt-sr

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Project description:

A reduction in vascular health and muscle mass, strength and function (termed sarcopenia) contributes to physical weakness and the development of aging-associated chronic diseases. Blackcurrants contain a variety of bioactive compounds but are particularly rich in anthocyanins. This flavonoid exhibits anti-inflammatory, antioxidant, cardioprotective and neuroprotective effects, making it a promising candidate for the prevention and treatment of poor health in aging populations. However, whether regular blackcurrant extract (BE) consumption has the potential to maintain or improve skeletal muscle and vascular health in older adults is unknown.

The anthocyanin content of blackcurrants differ depending on plant species, cultivation techniques, growth location and environmental factors. In vitro fermentation experiments (that mimic the gut microbial environment) can be used to evaluate the effect of different BE on gut microbiota and identify the product with the greatest potential to improve gut health. This is critical as the metabolism of anthocyanins by gut bacteria is extremely important in driving health outcomes. This is particularly relevant in older individuals given their likely shift in gut bacterial composition i.e. known decreases in beneficial groups.

Randomised controlled trials are needed to i) determine the capacity for BE consumption to offset age-related loss of muscle mass, strength and vascular function, and ii) assess whether health outcomes are linked to changes in gut microbiome.

The objective of this project is to understand the impact of anthocyanin rich blackcurrant extract (BE) consumption on skeletal muscle and vascular health in older individuals.

In this project the student will:

1. Analyse BE sourced from different geographical locations for bioactive compound content
2. Perform a randomised control trial to test the impact of anthocyanin rich BE consumption on muscle and vascular health in older adults
3. Investigate the effect of BE consumption on the gut microbiome, and correlations with muscle and vascular effects.

Training opportunities:

The student will gain valuable experience in basic science techniques (in vitro and in vivo) and clinical skills. They will learn how to perform culture independent microbiology, HPLC / LCMS methods and molecular techniques such as PCR and FISH. They will undertake training in good clinical practice and RCT conduct, and learn how to use clinical devices for measuring body composition (DEXA, eIRMER training), muscle (Isokinetic Dynometer) and vascular function (ultrasound, NIRS). The student will also gain skills in statistical analysis.

Student profile:

We would encourage students with a passion for nutritional science and integrated (exercise) physiology to apply for this project. We welcome students with a background in health, nutrition and food sciences or a related life-science (e.g. biochemistry or biomedical sciences, sport & exercise sciences). The student should have good laboratory skills and ideally some practical physiology experience.

Stipend (Salary):

FoodBioSystems DTP students receive an annual tax free stipend (salary) that is paid in instalments throughout the year. For 2022/23 this will be £17,668 and this will increase slightly each year at rate set by UKRI.

Equality Diversity and Inclusion:

The FoodBioSystems DTP is committed to equality, 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.

In accordance with UKRI guidelines, 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.

For up to date information on funding eligibility, studentship rates and part time registration, please visit the FoodBioSystems website.