DOCTORAL SCHOOL

PhD Opportunity

Effect of New Zealand Blackcurrant on cardiovascular responses to prolonged inactivity and exercise

Supervisory team

Director of Studies: Dr Matthew Cook

Supervisors: Dr Andrew Renfree

Research Group: Human Performance Research Group

The PhD Opportunity

New Zealand blackcurrant (NZBC) has a unique and high profile of anthocyanins (Kähkönen et al 2003). Intake of NZBC has been shown to alter resting cardiovascular function by increasing cardiac output (Willems et al 2015; Cook et al 2017) and improve cycling (Cook et al 2015) and repeated high intensity running performance (Perkins et al 2015).

All these responses could have resulted from alterations in blood flow by blackcurrant. For example, Matsumoto et al (2005) observed oxygenated haemoglobin in the trapezius to be higher with 2-weeks intake of blackcurrant compared to a placebo during 30-minutes of typing. In addition, during a maximal voluntary contraction (MVC) of the trapezius performed 3-minutes following the typing, total haemoglobin was also higher. Furthermore, Cook et al (2017b) observed a 7-day intake of NZBC increased femoral artery diameter during a submaximal 120-second isometric contraction of the knee extensors, with a concomitant decrease in systolic, diastolic and mean atrial blood pressure.

Physical activity such as prolonged sitting (i.e., >1-hour) is associated with impairments in cardiovascular function of the macro and microcirculation (Pekas et al 2023). This PhD will examine the effects of supplementation of NZBC upon blood flow and cardiovascular function following prolonged sitting and exercise. It will involve laboratory data collection from a series that will likely use randomised, double-blind, placebo-controlled designs. Cardiovascular function at rest and during exercise will likely be measured using ultrasound techniques, blood pressure and heart rate variability.

References

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Application Process

To begin the application process please go to: https://www.worc.ac.uk/research/research-degrees/applying-for-a-phd/

The Interview

All successful applicants will be offered an interview with the proposed Supervisory Team. You will be contacted by a member of the Doctoral School Team to find a suitable date. Interviews can be conducted in person or over Microsoft Teams.

Funding your PhD

For information about Doctoral Loans please visit: https://www.worc.ac.uk/study/fees-and-finance/doctoral-loans.aspx

During your PhD you can access the Research Conference Support Scheme to support the costs of presenting your research at an external conference.

Research at the University of Worcester

Research is central to the University's mission to make a difference in everything that we do. We are committed to delivering excellent research which extends the boundaries of human knowledge, but which also improves people's lives by enabling

better health outcomes, improving food security, developing environmentally sustainable solutions for crop production and socially sustainable solutions to our ageing population, enhancing public knowledge and understanding of the past and present.

The University hence focuses its research around five high-level challenges facing society, locally, nationally and globally:

- **Human Health and Wellbeing**
- **Sustainable Futures**
- **Digital Innovation**
- **Culture, Identity and Social Exclusion**
- **Professional Education**

The success of our research is reflected in our continuous improvement in external research assessment processes. In the most recent Research Excellence Framework, REF 2021, the University saw a near 50% increase in the scale of its research and 12% increase in quality, building on its performance in REF 2014 when it was the UK's most improved university in terms of Research Power, a combination of scale and quality.

Research Degrees at Worcester

Our research students are central to our overall mission for research. They are working at the cutting edge of their disciplines and driving forward the quality of our research whilst enriching our research culture. We are looking to increase our research student numbers as a strategic imperative.

Our commitment to our students is reflected in the results of the Postgraduate Research Experience Survey 2023 in which we ranked 3rd for overall research student satisfaction nationally. Key to our success in his area is the Doctoral School, a focal point for all our research students.

It provides:

- day-to-day support for our students, both administrative and practical, through our dedicated team.
- a Research Student Study Space with both PCs and laptop docking stations.
- a comprehensive Researcher Development Programme for students and their supervisors.
- a programme of student-led conferences and seminars.

Widening Participation

As part of its mission statement the University is committed to widening participation for its higher degrees. Although most candidates will have an undergraduate and/or a Masters degree, the University is happy to accept applications from candidates with relevant professional qualifications and work related experience.

For further information or an informal discussion on this project, please contact Dr Matt Cook m.cook@worc.ac.uk