Centre of Excellence in Advanced Food Enginomics

Postgraduate Research Scholarship in Advanced Food Enginomics

Project Descriptions

General Description:

The Centre of Excellence in Advanced Food Enginomics (CAFE) is offering a scholarship top-up for six exceptional students with a background in Chemical and Biomolecular Engineering or relevant field to undertake a PhD as part of our reputed research team. The CAFE has been established at the University of Sydney in 2017. This centre aims to meet the food and health challenges of the 21st century creating and delivering nutritious and wholesome processed foods to improve human well-being. The CAFE comprises a cross-disciplinary cluster of high profile researchers. All research will be conducted using the state-of-art facilities and equipment located at the Faculty of Engineering, Charles Perkins Centre and Sydney Institute of Agriculture.

This will be a unique and exciting opportunity to:

- Work in a rich and multidisciplinary research environment
- Be mentored by reputable, world-leading researchers in the areas of engineering, agriculture, science, molecular biology and medicine
- Partake in translational research with substantive commercial impact
- Build entrepreneurship and innovation expertise in the Australian R&D sector
- Travel to top universities around the world and interface with internationally reputed specialists
- Work at the frontier of food enginomics and science
- Make a significant contribution to solving the food and health challenges of the 21st Century

General eligibility:

A preferred applicant must have:

- a strong honours degree in Chemical Engineering, Bioengineering, food chemistry or relevant field
- an ability to work both independently and collaboratively across different research disciplines and industry
- excellent communication and interpersonal skills with high level of competency in both written and spoken English.
- a proven record of exceptional academic and extracurricular performance

Project 1 – Discover the complexities of the human digestion process:

This project will focus on modelling the interactions between food, digestion and microbiome in the small intestine. You will be required to develop protocols to analyse the model microbiome population and then will move towards testing the effects of food and diet on the balance of this model microbiome.

Project eligibility:

- a demonstrated knowledge of Biochemistry, biochemical engineering, bioengineering or medical science
Project 2 – ‘Robogut’ Project:

This project will aim to develop a robogut testing system, at the University of Sydney, capable of testing the effects of food composition, new food products, probiotics and physical activity on the microbiome and human health. This is a truly interdisciplinary project that will be at the forefront of advanced human nutrition and foodomics research.

Project eligibility:
- a demonstrated knowledge chemical/mechanical engineering, process design or biomedical engineering
- experience with the design and use of analytics systems and equipment

Project 3 and 4 – ‘Food Supply Chain Innovation’ Project:

The overarching goal of this project is to design chemical sensors coupled with the internet of things and apply them to monitor food safety and traceability, to vastly improve the efficiency, sustainability and informatics of the whole food supply chain. A significant part of the project will be the design and development of active and intelligent biodegradable food packaging with highly sensitive and selective integrated biosensors.

Project eligibility:
- a demonstrated knowledge of polymer chemistry, nanotechnology and physics
- experience with the fabrication of plastic electronic materials

Project 5 – Advanced Food Processing:

You will be joining the ‘Replacing Lost Nutrients’ Project, which will be researching on developing next generation of active and nutritional foods products from food wastes and overcoming issues that exist to recover and release active ingredient from plant cell walls.

Project eligibility:
- a demonstrated knowledge in chemical engineering and biochemistry

Project 6 – Process design for food dehydration:

You will be joining the ‘Advanced Dehydration and Pasteurisation Processes’ Project. This project will develop the next generation of dehydration and pasteurisation techniques for the processing of labile food stuffs and ‘bioactive’ compounds. Furthermore, it will explore how the latest advances in membrane science can be used to fractionate proteins and other bioactive molecules.

Project eligibility:
- a demonstrated knowledge of process engineering

Application guide:

For further information, please contact Kate Gunn by emailing kate.gunn@sydney.edu.au.

For more information about the School of Chemical and Biomolecular Engineering please see: http://sydney.edu.au/engineering/chemical/.