Information on Postgraduate Research Scholarship - Ref: VCS-ES-05-19

Faculty: **Science and Engineering** **Department: Science**

Lead Supervisor: Dr Yanan Xu

Project Title:
Process development with red-light for production of carotenoids from *Dunaliella salina*

Project Description:

A multidisciplinary research programme in algal biotechnology, supported by the departments of Science and Chemical Engineering, is available for research aimed at designing a sustainable method to produce valuable carotenoids, especially *9-cis* β-carotene, in large-scale industrial microalgal cultivation facilities, based on light transformation in combination with micro-algal photosynthesis.

9-cis β-carotene has been implicated to play a central role in protecting against diseases including retinal dystrophies, chronic plaque psoriasis and atherosclerosis, and can be produced in high concentration by the halotolerant green microalga *Dunaliella salina,* especially in the presence of red light. *D. salina* is currently cultivated at industrial scale in either open pond raceways or photobioreactors but cost-effective systems for applying red light in cultivation for a reliable, low-cost production of *9-cis* β-carotene need to be developed and tested.

Models describing important parameters that control carotenoid productivity, based on measurement of the distribution of light intensity of different light wavelength within algal cultures, will be developed, then tested in different arrangements in photobioreactors and open pond raceways, from laboratory to pilot scale, in order to facilitate the delivery of a sustainable low-cost solution for producing *9-cis* β-carotene at industrial scale. Collaboration with an industrial partner in Spain is envisaged.

Duration: **3 years, Full-Time Study**

Bursary available (subject to satisfactory performance):

Year 1: £15,009 Year 2: In line with RCUK rate Year 3: In line with RCUK rate

In addition, the successful candidate will receive a contribution to tuition fees equivalent to the university's Home/EU rate, currently £4,327, for the duration of their scholarship. International applicants will need to pay the remainder tuition fee for the duration of their scholarship, currently £9,173. This fee is subject to an annual increase.

Person Specification of Essential (E) or Desirable (D) requirements:	
Criteria:	***E or D***
Education and Training:	
• 1st Class, First Division (Upper Second Class) Honours Degree or a taught Master's degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project	**E**
• For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA.	**E**
Experience & Skills:	
• Previous experience of undertaking research (e.g. undergraduate or taught masters dissertation)	**E**
• A strong background in biochemical engineering	**E**
• A good knowledge of cell biology, photosynthesis and biotechnology	**E**
• Knowledge/experience in laboratory microalgal cultivation	**D**
Personal Attributes:	
• Be motivated, creative and intellectual independent.	**E**
• Willing to engage in interdisciplinary research.	**E**
• Able to, under guidance, complete independent work successfully	**E**
Other Requirements:	
• This scholarship may require Academic Technology Approval Scheme approval for the successful candidate if from outside of the EU/EEA	**E**
• Ability to write scientific reports	**E**
• The scholarship must commence in September 2019	**E**

Closing date for applications: ***midnight UTC on 26 July 2019***

For further information contact: ***Dr. Yanan Xu*** ***E-mail: y.xu@gre.ac.uk***

Making an application:
Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

Please select the MPhil/PhD Science programme on the application form.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

- **Scholarship Reference Number (Ref)**– included in the personal statement section together with your personal statement as to why you are applying
- **a research proposal related to the subject topic** *
- **a CV including 2 referees** *
- **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant or if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** *

**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application you are encouraged to liaise with the Lead Supervisor on the details above.