PhD Studentship – Engineering Department, Lancaster University - October 2017

Project title: Recovery of added value compounds from juice industry wastes

Supervisor: Dr Emmnaouil H Papaioannou

Period of studentship: 3.5 years

Funding: The scholarship provides a stipend for its entire duration and covers the University tuition fees at UK/EU level, therefore is only valid for UK/EU applicants

Background: Worldwide fruit and vegetables are processed to juices adding value but generating substantial amounts of waste which are disposed of, or used as feed/compost with low value. These wastes present the juice industries with serious problems without viable technological solutions. Interestingly, these wastes could be ideal sources of valuable compounds with significant applications in the food, nutraceutical and materials sectors (e. g. polyphenols, sugars, pigments etc.), thus creating additional income and new jobs. The technological limitations for utilization of such streams arise from their unstable nature and downstream processing cost. This proposal is based on the design of an efficient bio-refinery process which utilises wastes from juice production industries and the most appropriate sustainable methodologies.

Project: The aim of this project is to develop novel strategies for the recovery of high value compounds from fruit and vegetable juice processing wastes. It is expected to develop novel analytical methods to meet the characterization challenges arising during the project. The application of innovative pre-treatments, such as enzyme hydrolysis and pulse electric field extraction for maximizing the target compounds’ recovery will be at the centre of the project together with the optimization of the parameters affecting extraction using water and/or its mixtures with appropriate solvents. The candidate will optimize the pre-treatments and membrane separation conditions (UF and NF) for the recovery of target compounds from dilute extracts. Finally, the candidate, using the collected data, will validate cost models of innovative industrial scale multi-step separation processes which implement the proposed strategies for valorisation of these wastes.

This project is supported by facilities in the Engineering building at Lancaster University (http://www.lancaster.ac.uk/engineering/) and also benefits from established industrial links.

Entry requirements: Candidates for this position should have or expect to achieve a first-class or upper second class degree in chemical engineering, chemistry, biochemistry or a closely related discipline. Experience in membrane separation processes, enzymatic pre-treatment and analytical methods (HPLC, mass spectroscopy, Ion Chromatography, UV-Vis spectroscopy and ICP) would be an
advantage. Due to funding regulations applications are restricted to UK/EU nationals. Excellent communication and English writing skills will be required.

Early applications are strongly encouraged. The successful candidate is expected to start no later than October 2018. The position is open and applications will be considered until a suitable candidate is appointed.

Formal applications should be made via the Lancaster University Postgraduate Admissions Portal. Once you have created an account you will be able to fill in your personal details, background and upload supporting documentation. However, it is recommended to notify before Dr Papaioannou of your interest in this position to help ensure timely consideration of your application.