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PhD Project Opportunity starting October 2019

University of Birmingham, Birmingham, UK

Supervisors: Dr. Aneika Leney and Prof. Helen Cooper

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Characterising Colourful Protein Complexes for Biotechnological Applications

Deadline Sunday, January 06, 2019

Funded PhD Project (European/UK Students Only). Please refer to <https://www.birmingham.ac.uk/research/activity/mibtp/index.aspx> and

<https://www.findaphd.com/phds/project/characterising-colourful-protein-complexes-for-biotechnological-applications/?p99358>

Project Description

Microalgae are becoming of increasing economic interest due to their application as a natural source of compounds such as lipids, pigments, proteins and polysaccharides. Of these, natural pigments such as phycobiliproteins, are of particular interest due to their biotechnological applications in food colourants, pharmaceuticals, and the cosmetic industry. One example of a phycobiliprotein being phycocyanin, the most commonly used natural blue pigment in the food industry for products such as jelly and bubble gum. Phycobiliproteins vary in colour and are the most fluorescent molecules known to date. Moreover, they are 20 times more fluorescent than any organic dye we are capable of synthesizing. Many phycobiliproteins are known to exist, however, few are being utilized to their full potential. This is mainly due to the lack of knowledge on the proteins overall composition, hindering greatly their wide spread applications.



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The project will aim to characterise phycobiliproteins from red algae and develop ways to utilize these powerful systems in biotechnological applications. The project will involve the use of native mass spectrometry to analyse these large protein complexes.

Throughout the PhD, you will gain hands on training in state-of-the-art mass spectrometry techniques associated with the analysis of proteins and protein complexes. In addition, you will use UV absorbance, SDS PAGE and alternative biochemical techniques. Thus after completion of the PhD, many career paths will be possible.

Birmingham has an excellent reputation in mass spectrometry research. Ideal applicants will have a strong background in biochemistry. Applicants do not need experience in mass spectrometry but should be quick learners and enthusiastic to learn mass spectrometry-based techniques.

Relevant Publications:

Leney A.C.*, Tschanz A., Heck A.J.R. Connecting color with assembly in the fluorescent B-phycoerythrin protein complex. *FEBS J.* (2018) 285(1): 178-187.

Leney A.C., Heck A.J.R. Native mass spectrometry: what is in the name? *J. Am. Soc. Mass Spectrom.* (2017) 28(1): 5-13.