



Project: Mechanisms of Cell Death in Acute on Chronic Liver Failure: Necrosis, Apoptosis and the Emerging Role of Nucleosomes

'Winning this award is a humbling privilege and a great personal achievement. It will go a long way towards allowing the continuation of my research project around busy clinical commitments and it has helped me build on my ambition to pursue a career in gastroenterology and hepatology.'

'Liver diseases are set to pose ever increasing demand on public health and receiving support and recognition from the Dr Falk Core Bursaries can only help galvanise young researchers to want to embark on projects to further help this patient group.'

Patrik Bachtiger is currently undergoing his Academic Foundation Year 2 in Intensive Care Medicine at University College London Hospital (UCLH). His research was carried out at the Institute of Liver & Digestive Health, the Royal Free Hospital, London.

'I have held a keen enthusiasm for gastroenterology and hepatology throughout my time at medical school, and ever since my first undergraduate lecture in hepatology I have been fascinated by the physiology of the liver in particular.

'Liver disease is the fifth biggest cause of death in the UK population. However, compared to the other top five causes of death, rates of liver disease have seen a dramatic increase in recent decades. The economic impact of liver disease is vast, and outcomes for these patients - despite intensive care organ support in many cases - remains poor.

'Causes of liver disease are myriad and varied, however alcohol-induced, viral and fatty liver disease rank among the most common. These can often run in a similar clinical progression. Once the liver is sufficiently damaged, symptoms of failing liver function will manifest, known as an acute decompensation (AD).'

When this happens, with associated failures in other organs e.g. kidneys, the condition is described as acute on chronic liver failure (ACLF). The short-term mortality in these patients is high, more likely in younger patients and, interestingly, predisposed towards those without prior AD episodes. Most of the 170,000 cirrhosis deaths every year in Europe are due to ACLF and the cost in the USA is \$3Bn and £50K per ACLF survivor in the UK.

'Studies to understand the molecular basis of how liver cells are being killed - and how to intervene in this - are essential. My project sets out to elucidate the mechanisms by which the cells of the liver are killed during ACLF, by measuring blood markers of cell death in patients with different grades of ACLF and AD, as well as exploring the role of nucleosomes (a molecule which can cause inflammation) in triggering cell death. This may lead to us being able to monitor and identify patients at risk of developing ACLF and propose targets for drug development and therapeutic monitoring.'

Dr Bachtiger's supervisor Professor Rajiv Jalan comments:

Patrik has done some very interesting and substantial work to characterise the mechanisms of cell death in patients with Acute on Chronic Liver failure (ACLF). The present application is to further develop the consequences of cell death in ACLF. I wish Patrik all the best for the future and look forward to continuing excellent work with Patrik.