MEDICAL STUDENT PRIZE WINNER:

MS JORLIN LIU

PROJECT: Fatty acid metabolic pathways in hepatocellular carcinoma: novel biomarkers and treatment target.

'I am incredibly grateful to Dr Falk and Guts UK for this award. It is amazing to feel that this work is being recognised and valued, despite it being only an iBSc project conducted by a pre-clinical medical student. Through this project, I have become particularly interested in cancer cell biology and hope to contribute to further research in this area in future, alongside clinical work.'

Ms Jorlin Liu is currently completing an intercalated BMedSci at University College London Institute for Liver and Digestive Health and will return to take up her 4th year of medicine at the University College Medical School in September.

'This project looks at hepatocellular carcinoma (HCC)- a primary liver cancer and the third greatest cause of cancer mortality in the world. Surprisingly, we know very little about the cellular and molecular mechanisms that link diet, obesity and malignancy. Given the onset of the global obesity epidemic, HCC will likely become much more prevalent in the future and this link is crucial to establish if we are to make advancements in the prevention and treatment of this disease. This motivated me to choose this project, which looks specifically at characterising altered lipid pathways in HCC.

'We looked at two enzymes: long-chain fatty acyl coA synthestase 3 and 4 (ACSL3 and ACSL4), which are key gateway enzymes to lipid metabolism in the cell. An established hallmark of cancer cells is that they reprogram their metabolism in order to meet the energetic and biosynthetic needs of continuous uncontrolled cell division. Emerging evidence suggests that there is often a switch from using glucose to using lipids as a predominant source of fuel by the cancer cell, but the area of cancer lipid metabolism is greatly understudied.

'We found that levels of ACSL3 and ACSL4 were both significantly elevated in HCC compared to normal liver tissue and metastases from elsewhere in the body to the liver. Moreover, our results suggest that HCC is an excellent immunohistochemical marker, which performs well to distinguish HCC from normal liver tissue in tissue biopsy samples. Although they are very similar in sequence homology, these two enzymes play very different roles in the cancer cells and have different subcellular distributions. These pathways could be targets for HCC drugs in future.'

Ms Lui's Supervisor Dr Mark Waugh comments:

'Jorlin is an excellent student - consistently hardworking, diligent and pro-active and her performance has been nothing short of outstanding. Her productivity and the quality of her experimental results generated to date are on par with my expectations for an experienced post-doc.

Jorlin has quickly managed to design, plan and execute her own experiments, which is very pleasing to observe but seldom encountered at such an early stage with an undergraduate student. She has demonstrated a deep and passionate interest in elucidating the molecular drivers of hepatocellular carcinoma and the work she has proposed in this application is likely to generate results suitable for publication in a peer-reviewed journal.'