



## **PROJECT:** Understanding the Role of Gene Regulation in the Pathogenesis of Inflammatory Bowel Disease

*'Winning the Dr. Falk Core Research Grant firstly contributed to funding this research during my FY2 year, and has given me the opportunity to carry out additional research on this project in the next months. It has also helped me in deciding my career path, and has given me confidence in pursuing an academic clinical career in the future.'*

*Dr Dahlia Hopmeier is a Foundation Year 2 Doctor at Guy's and St Thomas' NHS Foundation Trust. She has recently completed a research rotation at Guy's Division of Genetics and Molecular Medicine.*

'I have a long-term interest in genetics, having studied and worked in the field prior to medical school. Once I was exposed to clinical work I soon realised that I wanted to be involved in translational research, bringing new diagnostics and treatments from the lab to the bedside.

'My experiences with people with inflammatory bowel disease (IBD) in both a personal and professional context lead me to seek research opportunities in this condition.

'Ulcerative colitis and Crohn's disease are the two main types of IBD, a disorder which causes inflammation of the digestive tract. Although research has suggested that the immune system, environmental factors, gut bacteria and genetics play a role, the causes are still not fully understood. There is no known cure, and treatment is aimed at controlling symptoms, but at present most people will experience flare-ups.

'Genetic research has identified over 200 genetic changes in our DNA that may be involved in causing IBD, but many of these are in regions where no genes are found.

This could mean that these mutations affect the amount of gene product made (for example because they are found in regions involved in gene regulation) rather than by affecting the gene directly. By finding out which genetic changes influence the amounts of which genes, we can deepen our understanding of what causes IBD, and hopefully develop new treatments. In this study I looked at 3 genetic changes shown to be linked to IBD, and compared this data with gene levels of 4 genes found close to these mutations.

'In two of the cases there was no association with the mutations and the levels of genes made. However, in one case it was highly significant that this mutation, which is linked to increased IBD risk, decreases the amount of a gene found near it. As this gene is involved in interesting cellular pathways that are known to be involved in IBD, this data is a promising starting point for further research.'

### ***Dr Hopmeier's Supervisor Dr Natalie Prescott comments:***

'Dr Hopmeier has an extensive knowledge of genetic mechanisms of human disease. In addition to her excellent theoretical knowledge, through her various laboratory placements, Dr Hopmeier has gained a vast amount of technical and research experience particularly in the areas of DNA analysis and genomics. 'This important work will be used to develop functional assays of relevant immune response to establish the effects of altered expression on inflammation'.