WTDTP Projects for September 2023

Project Reference: T13/60

Project Title: **Applying multi-omics to understand the functional role genetic variants play in the biology of lung function and COPD**

Theme(s): Cross-Theme Project - Themes 1 and 3

Primary Supervisor: Prof Martin Tobin (University of Leicester) [martin.tobin@leicester.ac.uk](mailto:martin.tobin@leicester.ac.uk)

Secondary Supervisor(s): Dr Nick Shrine (University of Leicester)

Department: Health Sciences

Project Summary: Chronic respiratory diseases affect 545 million people, and represent the third leading cause of death globally. Most of these deaths are due to chronic obstructive pulmonary disease (COPD), in which lung function is impaired. Members of the supervisory team have discovered genetic variants associated with lung function and COPD, and some of these also show involvement in asthma and interstitial lung disease. We now need a more complete understanding of how lung function-associated genetic variants relate to DNA methylation and gene expression in relevant cell types, and to circulating protein and metabolite levels. Such knowledge will inform drug development and biomarker development for COPD and related respiratory diseases.

The student will have an opportunity to study multi-omic data across cohort studies using established and still-developing analysis approaches that integrate these large-scale data. The project would suit a student with a strong statistical and computational background, with an interest in developing advanced skills in statistical genetics, including inference from epidemiology studies, analysis of genetic association studies from array and sequencing data, and bioinformatics. You will be based at the University of Leicester, UK, with an opportunity for funded placements with one of our industry or academic partners.