WTDTP Projects for September 2022

Project Reference: T1/40

Project Title: **Using genetic data to identify and characterise subtypes of asthma to inform drug**

**development and precision medicine**

Theme(s): Theme 1: Genomics for drug development & pharmacogenetics

Primary Supervisor: Dr Kath Fawcett (University of Leicester)

Secondary Supervisor(s): Prof Ian Sayers (University of Nottingham) Prof Liam Heaney (University of Belfast)

Department: Health Sciences

Project Summary: Asthma is a condition affecting over 300 million people worldwide. It is now recognised that there are different types of asthma (also called subtypes) with distinct causal mechanisms, and different responses to therapies. For example, approximately 5% of individuals with asthma have severe forms of asthma that do not respond to any currently available treatments.

The aim of this project is to use genomic and phenotype data from a large population-based cohort (the UK Biobank) to identify potential subtypes of asthma. This will involve exploring (and potentially helping to develop) cutting-edge methods for dimension reduction of variant-trait association matrices. These subtypes will then be validated and characterised in asthma patients from asthma-specific cohorts such as GASP and RASP-UK. This work has the potential to inform development of new therapies for treatment-unresponsive asthma and the targeting of existing therapies to patients most likely to respond.

The studentship will be based within an internationally-recognised genetic epidemiology group at the University of Leicester offering excellent training in statistical genetics and genetic epidemiology, bioinformatics, and health data science. The student will be co-supervised by experts in the clinical aspects of asthma and will have the opportunity for placements at the University of Nottingham and with industrial partners.