WTDTP Projects for September 2022

Project Reference: T1/42

Project Title: **Multi-omic approaches to understand the medium and long-term effects of COVID-19 and**

**identify novel therapeutic opportunities**

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

Primary Supervisor: Prof Louise Wain (University of Leicester)

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Department: Health Sciences

Project Summary: More than half a million people have been admitted to hospital with COVID-19 since the pandemic was declared in 2020. In-hospital mortality has reduced from 30% initially to less than 16% currently meaning there are more than 300 000 post-hospitalisation survivors of COVID-19 in the UK. The first large UK study of hospital survivors reported that only a third felt fully recovered 5 months after leaving hospital with a substantial persistent health burden that was only weakly related to the severity of the initial illness.

This project will involve integrative multi-omic data analyses, including machine-learning, to generate new insights into the mechanisms that underlie ‘long-COVID’ and other after-effects of COVID-19 in order to identify potential new treatments. We have collected longitudinal clinical data and research samples for over 2500 post-hospitalisation survivors of COVID-19 from across the UK. We are generating genomic, proteomic and microbiomic data, as well as targeted biomarker and immunological assay data, linked to detailed health outcomes, electronic healthcare records and other COVID-19 studies. This rich resource therefore presents an exciting opportunity to develop and apply state-of-the-art analytic approaches to directly answer important research questions about the biological processes that underlie the medium and long-term effects of COVID-19.