Project Details	
Project Code	MRCPHS24Ca Rice
Title	Characterising “immunometabolic” depression in young people
Research Theme	Population Health Sciences
Summary	Early-onset depression (by the early 20s) it is associated with especially poor outcomes, a chronic and relapsing course, and is difficult to treat. There is increasing evidence that inflammation in the body is related to depression. Some symptoms of depression may be more strongly related to inflammatory biological states. This project will use existing longitudinal data to understand the relationship between inflammation and early-onset depression.
Description	Depressive disorder affects over 300 million people worldwide and interferes with physical health, education and work. When depression starts early (by the early 20s) it is associated with especially poor health and functional outcomes, a chronic and relapsing course, and is difficult to treat. There is increasing evidence that inflammation in the body is related to depression. Some symptoms of depression may be more strongly related to inflammatory biological states. This project will focus on early-onset depression and will test: 1) Is there a profile of specific depressive and metabolic symptoms associated with inflammation? 2) How stable are inflammatory markers in people with depression over time? This will help establish the direction of effects i.e. does inflammation affect depression or vice versa? 3) Are inflammatory and immune markers related to the trajectory of depression over time? I.e. do these markers predict average depressive symptoms and rate of change over time? This PhD will utilise several datasets well suited to addressing the research questions where information on depression (symptoms, diagnosis), markers of metabolic and immune functioning, and detailed information on social and demographic factors are available. These include data from population cohorts (i.e. Understanding Society, a cohort of 20,000 adults and children) and from longitudinal high-risk cohorts of patients with depression and their families (i.e. the Early Prediction of Depression study of 337 parents with treated depression and their adolescent children). In both these data sets, there is information on immunometabolic markers and depression, with particularly rich information about depression in the EPAD study and a very large sample size in the Understanding Society cohort. The PhD will include interdisciplinary training in psychoneuroimmunology, epidemiology and longitudinal population and high-risk data sets. The student will have opportunities to gain experience in public engagement and to work with and present findings to stakeholders, including experts by lived experience of depression, policy makers and practitioners. Through the process of completing this PhD, the student will be trained in longitudinal statistical modelling, inflammation and immunity as applied to mental health and developmental psychopathology. The supervisory team has expertise in advanced longitudinal analyses (LR Cardiff), inflammation and immunity related to mental health (GK Bristol, NH Cardiff), early onset depression (FR Cardiff), clinical trials (GK Bristol, NH Cardiff, FR Cardiff) and depression treatment resistance (GK Bristol, NH Cardiff). In year 1, the student will review the literature and focus on comparing depressive symptoms and metabolic markers

	plus potential confounders (e.g. sex, BMI, social deprivation) in those with high and low levels of inflammation in relevant data sets. The student will spend time in GK's group in Bristol and with NH's group in Cardiff for training in psychoneuroimmunology. Training in the epidemiology of early onset depression and in longitudinal statistical analysis will occur via regular supervision meetings with FR and LR. In year 2, the student will focus on investigating the stability of inflammation over time using longitudinal data to establish the direction of effects i.e. does depression influence inflammation or vice versa. They will complete formal and informal training in longitudinal analysis and trajectory models. Year 3 will involve trajectory analysis of depression investigating the role of inflammatory and metabolic markers in the course of depression (i.e. initial severity and rate of change). Year 4 will involve completing the write up of the thesis, revising submitted papers, public engagement and dissemination of findings. There will also be opportunity for a knowledge-exchange project of the student's choice.
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