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Summary of research

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The retina is one of the few places in the human body allowing easy, non-invasive observation of blood vessels, and there is mounting evidence that features associated with retinal vessels are early indicators of disease such as diabetes, hypertension, stroke and cardiovascular disease. Furthermore, blood vessels of the retina are thought to predict neurovascular disease in particular because they are part of the brain's vascular system, so they share anatomical features and respond similarly to stress and disease. Retinal imaging might provide an additional means to stratify risk and help identify people who would benefit from early lifestyle changes and preventative therapies. By applying computational analysis to fundus images (interior surface of the eye) it is possible to identify subtle vessel abnormalities which in turn may act as biomarkers of disease. We propose to assess the feasibility of using trained individuals to analyse fundus images via computerised software (VAMPIRE) on a subset of 2,000 fundus images (1,000 with myocardial infarction and 1,000 controls). This project will also generate retinal vascular measurement for use by other researchers. This project requires baseline data on eye images and data on cardiovascular risk factors (e.g., age, sex, smoking, obesity, family history, etc.) in a subset of UK Biobank participants.