Application number/Title: 42468 - Non-reproductive effects of endogenous androgen exposures, potential drivers of and downstream factors related to androgens: a Mendelian randomization study in the UK Biobank

Applicant PI: Dr Jie Zhao

Application Institution: University of Hong Kong

Keywords provided by the Applicant PI to describe the research project:
Androgens, Mendelian randomization, chronic diseases, coagulation, diet, endocrine disruptors

Application Lay Summary:
Besides the role in reproduction, androgens may also affect chronic diseases. The non-reproductive effects of androgens are getting more and more attention. This study aims to take advantage of recent advances in genetics to test whether genetic biomarkers of androgens are associated with major chronic diseases. We will also similarly examine whether genetic biomarkers of environmental factors which may affect androgens are associated with these chronic diseases, and explore the factors in the pathway.

The specific objectives are (1) examine whether people with higher levels of genetically predicted testosterone, dihydrotestosterone (DHT) and sex binding hormone globulin (SHBG) have higher or lower risk of diabetes, renal failure, auto-immune diseases, cancer and pre-eclampsia in the UK Biobank, which have not been proposed; (2) similarly to examine whether people with higher levels of androgen-related exposures (follicle-stimulating hormone, anti-Müllerian hormone and testicular dysgenesis syndrome) have higher or lower risk of these chronic diseases; (3) similarly to examine the role of factors possibly affecting androgens, such as nutrients and endocrine disruptors, and the role of factors on the pathway, such as coagulation factors, red blood cell attributes, endothelin-1 and inflammation, in these and cardiovascular diseases.

This study fulfils the purpose of the UK Biobank to support a diverse range of research intended to promote the primary prevention and clinical treatment of chronic diseases. Specifically, the proposed research will help investigate the
role of endogenous androgen exposures and factors affecting androgens in population health, as well as the potential pathways, such as via coagulation factors. The findings will also provide insights into modifiable targets of major chronic diseases, with corresponding implications for dietary interventions and new drug development, with relevance to primary prevention, public health policies and health care.