Application number/Title: 45052 - Genetic effect and genetic correlation among multiple related phenotypes and interaction with environmental exposures

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Keywords provided by the Applicant PI to describe the research project:
GWAS, gene-environment interaction, genetic correlation, heritability, prediction

Application Lay Summary:

This proposal aims to use UK Biobank data to estimate how genes are important to diseases (such as diabetes and heart disease) and traits (such as height and body mass index) and how such effect might vary by environmental exposures (such as dietary habit, physical activity and air pollutions). We will analyze multiple related diseases and traits together (such as type 2 diabetes and glucose level) to improve our understanding of genetic effect for individual diseases and traits. Complex diseases and traits are often affected by many genes and they might share similar genetic effect on a set of genes. By analyzing related diseases and traits together will boost the information and improve our chance to discover new genes and increase the accuracy of genetic effect estimation. We expect the project will last for 2-3 years but it might be extended due to new findings and development of new methods. Through the proposed project, we hope to provide to the public a better understanding to the diseases risk and trait development, new genes important to the diseases and traits which might be good candidate targets for diseases prediction or medicine development.