

**Principal Investigator**

Dr Eleftheria Zeggini

**Address**

Wellcome Trust Sanger Institute, Human Genetic, Wellcome Trust  
Genome Campus, Hinxton, Cambridge CB10 1HH

**Lead Collaborators:**

Professor Jeremy Willkinson, University of Sheffield, Human Metabolism, D  
Floor, Medical School, Beech Hill Road, Sheffield S10 2RX

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**Summary of research**

Genetics, osteoarthritis, total joint replacement

**Application Lay Summary:**

**1a:** We are requesting access to the full UK Biobank genotype data along with phenotype data on osteoarthritis and related traits. We will carry out a nested case-control study for OA and will additionally investigate genetic overlap between OA and related traits, whilst adjusting for appropriate covariates.

**1b:** The proposed work fits in with the aims of UK Biobank, as it seeks to identify associations between sequence variants and a disease of medical relevance. It leverages the large sample size of the UK Biobank cohort for an OA GWAS of unprecedented scale.

**1c:** We will carry out a nested case-control study for OA and will additionally investigate genetic overlap between OA and related traits, whilst adjusting for appropriate covariates. These include age, sex, anthropometric measurements, blood biochemistry, as well as other demographic and lifestyle data including

region of origin, occupational activity, HRT information and smoking habits. We would also like to request data on OA severity (Kellgren-Lawrence score, if available), age at OA diagnosis, and information on total joint replacement surgery including joint site, and age at surgery. The focus of our work is on complex trait genetics. We design and carry out large-scale genetic association studies and aim to identify genetic loci associated with osteoarthritis. The data will be used in genotype-phenotype association studies and will contribute to genome-wide discovery efforts, as well as to replication efforts for already-identified promising signals in independent samples. Our team is positioned among global leaders in OA genetics.

**1d:** Full cohort, divided into case-control by OA status