

Principal Investigator

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Summary of research

Oral health, Genetic epidemiology, Stratified medicine

Application Lay Summary:**1a: Aims:**

- 1) To estimate the heritability of, and genotype-by environment interactions for oral health disorders, and genetic correlations with age-related and behavioural disorders,
- 2) Identify genetic variants associated with oral health, and
- 3) To stratify individuals based on their genetic and environmental risk profiles.

Oral health disorders:

- 1) Diseases of oral cavity and salivary glands
- 2) Primary head and neck malignant neoplasms
- 3) Caries
- 4) Periodontal disease

Research questions:

- 1) Can genetic information be used to stratify individuals for public oral health interventions?
- 2) What is the relationship between oral health disorders and age related and behavioural traits?

1b: To UK Biobank Resource linked to NHS oral health data provides a unique opportunity to unravel the genetic and environmental components of oral health phenotypes; providing for findings that have prognostic value, and can be used for risk stratification at the population level. This study therefore meets all UK Biobank's stated purposes: by opening a brand new avenue of research within the UK Biobank Resource, and through the provision of a knowledge base that can be used to improve the prevention, diagnosis and treatment of oral diseases and the promotion of oral health throughout society.

1c: Data:

- 1) NHS oral disease and cancer records for all individuals in UK Biobank.
- 2) UK Biobank pedigree, genotype, environmental and phenotype data for all individuals in UK Biobank.

Statistical analysis: the genetic components of, genotype by environment interaction with oral health phenotypes will be estimated. Genome-wide association studies for oral health disorders will be conducted. Research into the application of genetic and environmental risk factors in the prediction of oral health disorders will also be undertaken. Correlations with age-related and behavioural disorders will be investigated to determine whether this information can be used to improve predictive performance.

1d: NHS oral health and cancer records for all individuals, and UK Biobank pedigree, genotype, environmental and phenotype data will be required for all individuals in UK Biobank.