



Application number/Title: 21552 - Detection of large-scale copy-number and copy-neutral mosaic alterations in circulating leukocyte DNA of UK Biobank cancer cases and cancer-free controls

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Funding Body: Applicant Institute

Keywords provided by the Applicant PI to describe the research project:

Cancer, Association, Mosaicism, Somatic, Clonal, Genetic

Application Lay Summary:

1a: We aim to investigate potential differences in frequency and location of large acquired copy number mutations in blood derived DNA of cancer cases and healthy controls. Our past research has demonstrated that the frequency of large, mosaic mutations increases with age, but has produced limited evidence for cancer associations. The UK Biobank is a well-powered collection of samples with the opportunity to provide new insights into how large acquired copy number mutations in the blood may be related to future cancer risk as well as perform a genome-wide association study of mosaic copy number alterations.

1b: Our proposed research compliments UK Biobank's aim of improving the prediction and detection of serious and life-threatening illnesses such as cancer by investigating how an individual's acquired copy number mutations may relate to their future risk of cancer.

1c: Our calling algorithms will scan the chromosomes of all UK Biobank participants with genotyping data to detect large, acquired mosaic events. Frequencies and locations of events will be compared across individual characteristics in univariate and multivariate models to better understand how acquired copy-number and copy-neutral events relate to cancer risk.

1d: We propose to use all participants from the full cohort with available SNP array genotyping data.