Application number/Title: 28072 - Evaluating the biological mechanisms underlying occupational and environmental exposures on risks of cancer, cardiovascular disease, and mortality

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

Diesel, air pollution, telomere, cancer, mortality

Application Lay Summary:

1a: We propose to evaluate the:

-Associations of occupational diesel exhaust exposure, shift-work, sleep duration, and residential PM10/PM2.5/NO2 exposure, to risk of all incident cancers and cardiovascular diseases, and all-cause, cancer-specific, and cardiovascular-specific mortality.

-Associations of occupational diesel exhaust exposure, shift-work, sleep duration, and residential PM10/PM2.5/NO2 exposure, to biological markers including blood cell counts, and white blood cell differentials.

-Interrelationship between environmental/occupational exposures, biological markers, and risk of all incident cancers and cardiovascular diseases, and all-cause, cancer-specific, and cardiovascular-specific mortality using mediation analyses.

1b: UK Biobank aims to improve the prevention, diagnosis and treatment of a wide range of serious and life-threatening illnesses, including cancer and cardiovascular diseases. Findings from our proposed study may: 1) improve prevention of diseases by identifying harmful environmental/occupational exposures and providing evidence for regulatory control of these exposures, and 2) improve treatment of diseases by identifying potential biological targets for

intervention, before disease diagnosis.
1c: Using all available anthropometric, demographic, lifestyle, medical, environmental, occupational, genetic, and biological data from the UK Biobank, we will investigate the interrelationship between exposure to diesel exhaust exposure, shift-work, sleep duration, and residential PM10/PM2.5/NO2 exposure, markers of biological change, and risk of all cancers, cardiovascular diseases, and death. To assess these relationships, we will use advanced statistical techniques that can detect potential patterns in the vast amounts of data, while accounting for sources of bias that can produce spurious results.

1d: Full cohort, all participants.