**Application number/Title:** 23112 - Physical activity and cancer: risk, prognosis, and mechanisms

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**Keywords provided by the Applicant PI to describe the research project:**
- activity, cancer, risk, sedentary

**Application Lay Summary:**

High levels of physical activity, and to a lesser extent low levels of sitting time, have been shown to reduce the risk of developing cancer, and improve the likelihood of surviving the disease. Previous research has been limited by reliance on self-reported estimates of physical activity and sedentary behaviours. We aim to explore how self-reported and objectively measured physical activity and sedentary behaviour (sitting time) relate to cancer risk, and to how long people survive for after diagnosis. This research will help to improve our understanding of how physical inactivity and sedentary behaviour contribute to the cancer burden. The proposed research will estimate the effect of physical activity and sedentary behavior on cancer risk and prognosis. We will also conduct analyses to further understand the mechanisms related to cancer prevention and improved survivorship within the cohort. Preventing cancers and improving prognosis through changes in modifiable lifestyle factors is an important health-related research area. The results of the proposed research may have public health implications by helping refine physical activity guidelines for cancer prevention (e.g. suggesting optimal patterns of physical activity accumulation), as well as for improving survivorship and quality of life in cancer patients. We will use both self-reported and accelerometer estimates of physical activity and sedentary behaviour to examine their impact on cancer risk, cancer survival and health outcomes after cancer diagnosis. Physical activity and sedentary behaviour levels
will be characterized among the overall cohort population, and among those who
developed cancer. The role of physical activity and sedentary behaviour on
overall and site-specific cancer risks will be assessed using statistical models that
adjust for other known cancer risk factors. Statistical models will also be created
to estimate the effect of physical activity and sedentary behaviour on cancer
survival and prognosis. Analyses utilising self-reported estimates of these
behaviours will be conducted with the full cohort (~500,000). For the analyses
focused on objective measures of physical activity and sedentary behaviour
derived from accelerometry data, a subset of the full cohort of participants
(~100,000 participants) will be used. Questions relating to survivorship will
include participants with prevalent disease; we will focus on sites with >1,000
prevalent cases i.e. colon (n=2,318); breast (n=9,323) and prostate cancer
(n=3,098).