

EpiMark - An integrated approach for epigenetic risk assessment and biomarker development for breast cancer in prospective cohorts -

Abstract

Despite the availability of new chemotherapeutic agents and progress in screening, breast cancer is still the most common cancer affecting women in developed countries. Epigenetic changes are ubiquitous in primary breast cancer, but less is known about the dietary/lifestyle and endogenous determinants of these changes. This project's underlying hypothesis is that environmental factors and endogenous cues trigger changes in the methylome, that these changes contribute to the onset of breast cancer, and that they can serve as biomarkers in primary and secondary prevention. The project's three main objectives are: (1) to identify DNA methylome changes in breast cancer and surrogate tissue using a large sample of several thousand subjects from a prospective cohort, (2) to establish dietary/lifestyle and endogenous determinants of epigenetic changes, and (3) to assess the predictive value of methylation markers in clinical settings. This project is based on the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort, a study conducted in 23 centres in 10 European countries, and will use powerful epigenomic technology for biomarker discovery and validation. This study will provide unique insights into the role of risk factors in driving the epigenetic changes that are associated with breast cancer, and will reveal potential targets for biomarker discovery and future preventative strategies. Thus, the proposal is highly relevant to the main objectives of this call: providing a scientific basis for primary and secondary prevention of cancer.