# ENVIROGENOMARKERS: A EUROPEAN MOLECULAR EPIDEMIOLOGY PROJECT ON THE DEVELOPMENT OF BIOMARKERS OF ENVIRONMENTAL HEALTH BY *-OMICS.

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**Background and Aims**: EnviroGenomarkers is a project aiming at the development of a new generation of biomarkers to study the role of environmental agents in human disease through the large-scale application of a range of –omics technologies (*-OMICS). Breast cancer and lymphoma related biomarkers will be developed using a case-control design nested within two prospective adult cohorts. Biomarkers of neurodevelopmental effects during early childhood will be studied within a prospective child cohort.
**Methods:** Prospectively collected biosamples are being analysed with high-density screens, including plasma metabonomics using HPLC/MS/MS, epigenomics using CpG island microarrays, gene expression using whole-genome microarrays and targeted proteomics using multi-analyte profiling arrays, in combination with advanced bioinformatics. Exposures of interest (PCBs, PAHs, cadmium, phthalates and brominated flame retardants - PBDEs) are evaluated using validated biomarkers of exposure.
**Results:** Methodological studies were performed to mimic the range of conditions likely to have been encountered during the processing and storage of the biobank samples. These studies showed an effect of prolonged bench time > 8hrs on all OMIC platforms. Furthermore, an effect of anticoagulants was found for several OMIC-technologies. Using only samples from the biobanks with a bench time less than 8hrs indeed showed that high quality data could be obtained from stored biobank samples for 80-100% of the samples depending on the technology applied.
**Conclusions:** It is concluded that samples from long-term storage in existing biobanks can be successfully analysed using omics technologies provided they are selected to satisfy identified criteria regarding their handling history. Based on this, the project has recently moved on to its next phase involving the application of the high-density technologies on biobank samples from the study cohorts to identify markers of environmental risk factors of breast cancer and lymphoma.
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