Biobank storage time as important as age

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The amount of time a blood sample used for medical research has been stored at a biobank may affect the test results as much as the blood sample provider's age. These are the findings of a new study from Uppsala University, which was published in the scientific journal *EBioMedicine*. Until now, medical research has taken into account age, sex and health factors of the person providing the sample, but it turns out that storage time is just as important.

"This discovery will change the way the entire world works with biobank blood," says researcher Stefan Enroth, who presented the new findings along with Professor Ulf Gyllensten. "All research on, and analysis of, biobank blood going forward should also take into account what we have discovered, namely the time aspect. It is completely new."

In their research on the treatment and diagnosis of uterine cancer, the researchers looked at large volumes of protein samples. The samples come from the Västerbotten Intervention Programme at Umeå University, and were collected from 1988 to 2014.

They analysed 380 different samples from 106 women between the ages of 29 and 73. To study the impact of storage time, only samples from 50-year-old women were used in order to isolate the time effect. 108 different proteins were analysed. In addition to how long a sample had been frozen, the researchers also looked at what year the sample was taken and the age of the patient when the sample was taken.

"We suspected that we'd find an influence from storage time, but we

thought it would be much less," says Professor Ulf Gyllensten. "It has now been demonstrated that storage time can be a factor at least as important as the age of the individual at sampling."

Blood from biobanks has been used in research aimed at producing new drugs and testing new treatment methods. The results of this study are important for future drug research, but it is not possible or necessary, to repeat all previous biobank analyses.

"Most of the previous inaccuracies have most likely involved the tested preparation or treatment providing a false negative result," says Stefan. "Differences between groups, for example, may not have been seen because cases were collected over a long period, whereas controls were collected at a single point in time."

The other major finding of the study is that the protein levels in the blood plasma vary depending on the season or month in which the samples were taken. Some of these differences can be explained by the amount of sunlight subjects were exposed to at the time of sampling.

"There are earlier studies exploring how proteins are affected by storage time, but they have dealt with individual proteins and small groups of patients," says Ulf. "We have done the largest study ever, on the most people and over the longest period of time."

More information: Stefan Enroth et al. Effects of Long-Term Storage Time and Original Sampling Month on Biobank Plasma Protein Concentrations, *EBioMedicine* (2016). DOI: 10.1016/j.ebiom.2016.08.038

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