Novel biomarker technology for cancer diagnostics

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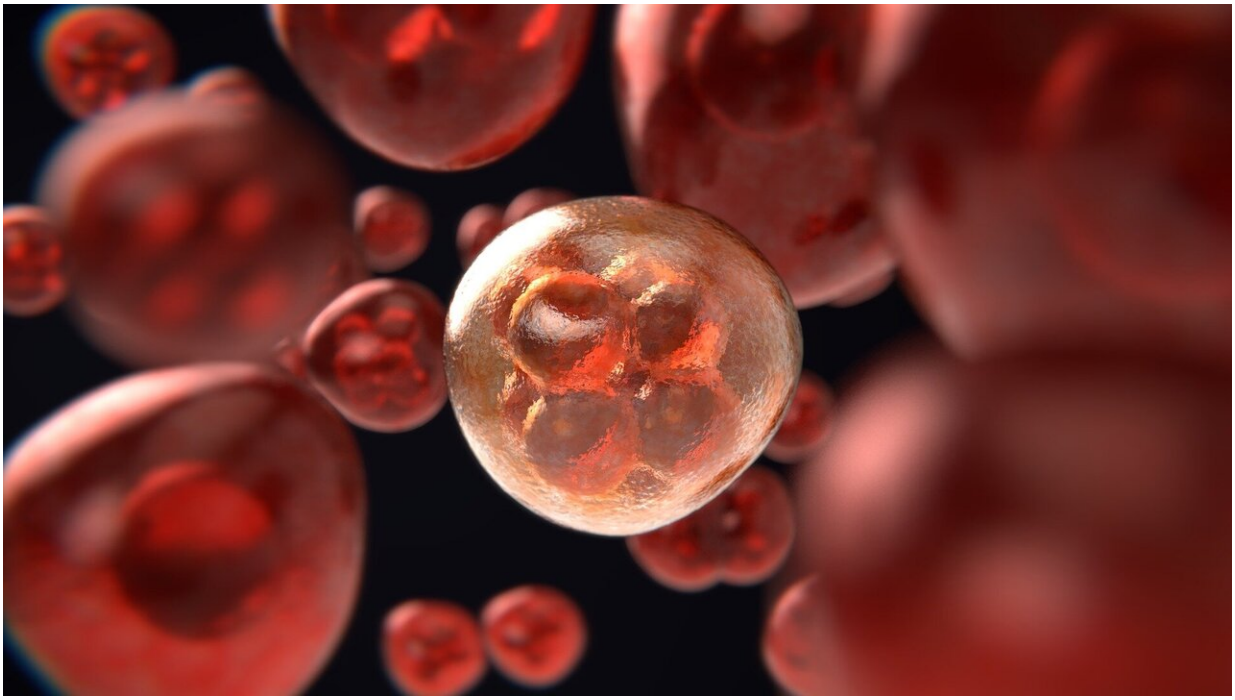

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A new way of identifying cancer biomarkers has been developed by researchers at Lund University in Sweden. The new technology allows very sensitive, quick and cost-effective identification of cancer biomarkers. The research is published in *Nature Communication Biology*.

Today, every third person will get cancer in their lifetime, and the

current trend suggests that in a few years that number will be one in two. If diagnosed earlier than today, a majority of cancer cases would have a much more favorable outcome for patients. WHO has projected that a third of all cancers could be cured if diagnosed already at tumor stage I/II, that is, asymptomatic patients.

CREATE Health Cancer Center at Lund university has in collaboration with Immunovia AB developed a new technology combining the specificity of antibodies with the sensitivity of next-generation sequencing. The technology will pave the way for the next generation of biomarker discovery program in cancer, where there is still a tremendous unmet need.

"We have for years been developing advanced diagnostic approaches for multiplexed analysis of serum proteins, using a single drop of blood, for the purpose of early diagnosis of complex disease, in particular cancer. There is massive amount of information in blood and our combination of proteomics and genomics will open up for rapidly associating early tumor development with protein signatures. This in turn will benefit the patients with a more favorable outcome and overall survival. We are very excited with this novel next generation of biomarker discovery tool," says Professor Carl Borrebaeck, director of CREATE Health Cancer Center at Lund University.

About the method:

The novel approach, denoted ProMIS, Protein detection using Multiplex Immunoassay in Solution, circumvents the inherent technical problems in conventional biomarker research traditionally utilizing biomatrices, e.g. planar- or bead-based arrays, by instead profiling serum proteins in solution . Since the entire process can be performed in solution most inherent problems traditionally present using solid support is avoided. ProMIS utilizes scFv antibody fragments tagged with a DNA barcode.

The barcoded scFvs are mixed with biotinylated serum proteins coupled to streptavidin-coated magnetic beads, and bound antibodies are detected, using next generation sequencing (NGS). The combination of proteomics (antibodies) and genomics (NGS) will uniquely result in both a multiplex and ultra-sensitive read-out which in turn will increase the possibilities and success rate to find tumors earlier. This will benefit both patient and society.

More information: Mattias Brofelth et al, Multiplex profiling of serum proteins in solution using barcoded antibody fragments and next generation sequencing, *Communications Biology* (2020). DOI: 10.1038/s42003-020-1068-0

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