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COMPUTER-ASSISTED DETECTION OF PROTEOMIC PATTERN COULD HELP SCREENING FOR OVARIAN CANCER
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A sensitive and non-invasive computer-assisted technique which assesses proteomic patterns in blood could be a step towards effective screening for ovarian cancer, conclude authors of a fast-track study published on The Lancet website this week.*

New technologies for the detection of early-stage ovarian cancer are urgently needed, as the disease is often detected at a late stage when 5-year survival is only around 35%. Pathological changes within the ovaries might be reflected in proteomic patterns in the blood; Emanuel F Petricoin III from the US Food and Drug Administration, and colleagues from the National Cancer Institute (NCI) and Correlogic Systems Inc., Bethesda, USA, developed a bioinformatics process to identify proteomic patterns in blood that could distinguish malignant from benign tumours within the ovary.

The investigators analyzed blood proteins with mass spectroscopy, a technique used to sort proteins and other molecules based on their weight and electrical charge; it can provide a snapshot of thousands of proteins at once. A new computer-based "artificial intelligence" algorithm was used to identify the key diagnostic pattern. Initial assessment of 50 women with known ovarian cancer and 50 women without disease enabled the creation of distinct proteomic patterns that distinguished cancer from non-cancer. The discovered pattern was then used to classify an independent set of 116 masked blood samples: 50 from women with ovarian cancer, and 66 from unaffected women or those with non-malignant disorders.

The computer-generated algorithm identified a pattern that, in the initial assessment, completely segregated cancer from non-cancer. The discriminatory pattern correctly identified all 50 ovarian cancer cases in the masked set, including all 18 stage I cases. Of the 66 cases of non-malignant disease, 63 were recognised as not being cancer. This result yielded a sensitivity of 100% and a specificity of 95% (ie. 5% false-positive results).

Emanuel Petricoin III (FDA) and Lance Liotta (NCI) comment: "These findings justify a prospective population-based assessment of proteomic pattern technology, as a screening tool for all stages of ovarian cancer in high-risk and general populations."

- this fast-track study will appear on THE LANCET's website- www.thelancet.com—on Friday 8 February 2002, ahead of print publication in the Feb 16 issue of the journal.

Contact: Jennifer Michalowski, NCI Press Office, 9000 Rockville Pike, Bethesda, MD 20892, USA; T) +1 301 496 6641 F) +1 301 496-0846 E) michaloj@mail.nih.gov