

Technology Snapshot - Promarker®Eso's unique biomarker detection technology: Bead-Lectin Capture

The power of proteins - Real-time cancer detection

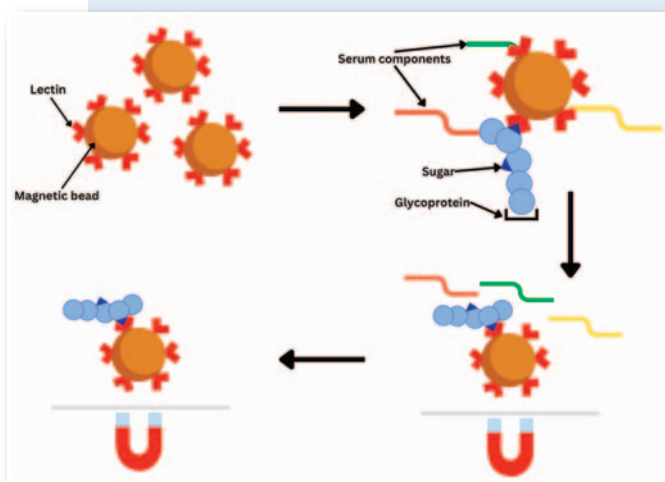
Proteins are large, complex molecules that play many critical roles in the body. The function of a protein can be changed through the addition of molecules as 'decorations' to the surface of a protein. One important surface feature is the attachment of a sugar (carbohydrate) molecule, a glycan. This attachment process is called glycosylation and proteins that undergo it are named glycoproteins.

Abnormal glycoproteins have been found to be a 'warning sign' with specific ones linked to a range of diseases including different cancers^{1,2}. Proteomics International's PromarkerEso test for esophageal cancer (EAC) utilises the measurement of four of these unique glycoproteins.

The Bead-Lectin Capture method

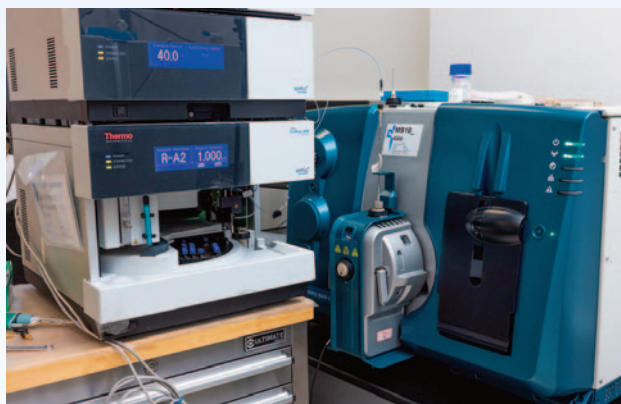
Blood serum is made up of a mixture of components including salts, lipids and thousands of different proteins. To isolate the glycoproteins of interest, a technique called lectin magnetic bead array (LeMBA) is used.

LeMBA uses specialised magnetic beads coated in lectins, which is a protein that naturally binds to the sugar on glycoproteins. When the beads are mixed with serum, the lectins on their surface bind to glycoproteins and a magnet is used to pull down the beads with the glycoproteins attached. This allows the unwanted components to be washed away while retaining the target biomarker glycoproteins.



The Promarker®Eso test

The PromarkerEso test is a blood test designed to rule out a patient having EAC. This is done by using the LeMBA method and mass spectrometry to measure the level of four glycoprotein biomarkers (alpha-1-antitrypsin, alpha-1-antichymotrypsin, complement C9, and plasma kallikrein) in plasma.



The level of these biomarkers is incorporated into a clinically validated algorithm along with clinical risk factors (age, sex and body mass index) to provide an EAC risk score that classifies individuals as low-, moderate-, or high-risk for the disease. PromarkerEso detects real-time cancer activity through the glycoprotein biomarkers and identifies early biological changes.

1 Protein Glycosylation in Cancer, 2016. *Annu Rev Pathol*. DOI: 10.1146/annurev-pathol-012414-040438

2 Altered glycosylation in cancer: A promising target for biomarkers and therapeutics, 2021. *Reviews on Cancer*. DOI: 10.1016/j.bbcan.2020.188464