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The search for biomarkers of liver cancer: What our failures have taught us

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5% of all deaths worldwide are the result of liver disease. Many of these deaths could be prevented through the early detection of advancing disease and subsequent intervention. Changes in glycosylation have long been associated with illness. Using a comparative glycoproteomics approach we have identified biomarkers that can detect the early stages of liver cirrhosis and liver cancer, the two major causes of liver disease mortality. Briefly, these biomarkers are common serum proteins with altered glycosylation. The altered glycosylation observed is increased levels of fucosylation. Using a simple plate based approach we have been able to examine the use of these biomarkers in the management of those with liver disease. While many of the markers showed great promise in independent cohorts and publications, markers often had poor sensitivity and specificity. Analyses of false positives lead to the discovery of secondary glycan modifications that resulted in false signals. In addition, examination of poor sensitivity in certain cohorts identified the importance of using specific cancer sub-types for both discovery and validation. Benefits of this talk include insights into the role of glycosylation in biomarker discovery and development, the targeted glycoproteomics method used to discover biomarkers and the growing importance of liver disease worldwide.

Biography

Anand Mehta, D.Phil., is an Associate Professor of Microbiology and Immunology, Drexel University College of Medicine. Dr. Mehta received his graduate degree in Biochemistry from the University of Oxford. Dr. Mehta was one of the first to examine total serum for changes in glycosylation as a function of cancer development. By combining glycomics with proteomics, Dr. Mehta discovered several biomarkers of liver disease and liver cancer, some of which are already available commercially in Asia (GP73, HotGen Biotech, Beijing, China) or under development in the USA.

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