OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Biomarkers & Clinical Research

July 2-4, 2012   Embassy Suites Las Vegas, USA

Search for biomarkers in blood serum: A proteomic investigation in different infectious diseases and gliomas

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Protein biomarkers that can assist in early detection, monitoring disease progression and following prognosis in response to the therapeutic interventions have valuable impact on clinical research. Analysis of serum proteome is an effective approach for deciphering disease pathobiology and identification of diagnostic/prognostic marker proteins, since this biological fluid has constant intimacy with different body parts and contains miscellaneous classes of proteins released by diseased tissues. This study was conducted to analyze alterations in the human serum proteome in different pathogenic infections and glioblastoma multiforme (GBM) to identify serum protein markers of these fatal human diseases and to obtain mechanistic insights about disease pathogenesis and host immune response. In this analysis serum samples from falciparum malaria, vivax malaria, dengue fever, leptospirosis, GBM subjects and healthy controls were investigated using various proteomic techniques. Multiple immunoassay-based approaches were also employed to validate the results obtained in gel and MS-based proteomic analysis. A panel of identified proteins consists of six candidates; serum amyloid A, hemopexin, apolipoprotein E, haptoglobin, retinol-binding protein and apolipoprotein A-I was used to build statistical sample class prediction models employing PLSDA and other classification methods to predict the clinical phenotypic classes which achieved very high prediction accuracy. This is presumably the first comprehensive analysis to demonstrate discrimination among multiple human diseases based on serum protein expression profiles.

Biography

Dr. Sanjeeva Srivastava is Group Leader of Proteomics Laboratory at IIT Bombay India. He obtained his Ph.D. from the University of Alberta and post-doc from Harvard Medical School. Current research in this group centers on using HT proteomics for biomarker discovery in various diseases, studying protein interactions and drug target discovery. He is recipient of several awards including National Young Scientist Award (Canada), Young Scientist Awards (India) and the Apple Research Technology Support Award (UK). He serves as Editor-in-Chief for International Journal of Genomics and Proteomics, and Associate Editor for several international journals, including Journal of Integrated OMICS.

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