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Differential proteomic profiling of control and STEMI subjects; probable implications towards reverse cholesterol transport

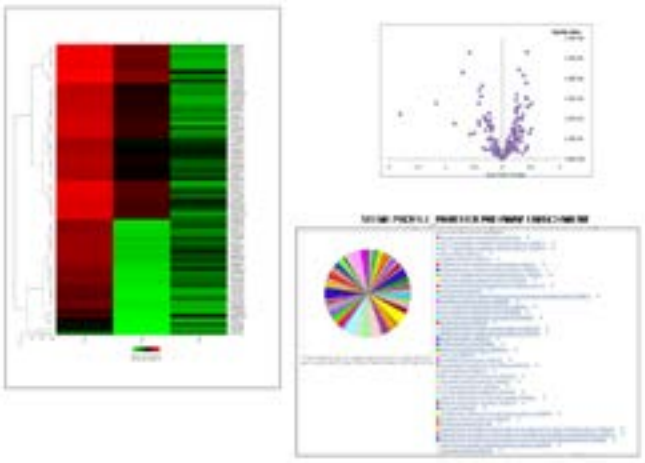
Kamalika Roy Choudhury, Apabrita Ayan Das and Arun Bandyopadhyay
CSIR-Indian Institute of Chemical Biology, India

Statement of the Problem: Atherosclerotic lesions in humans typically develop over years to decades; one of the longest incubation periods of disease onset in humans. Acute coronary syndrome (ACS) includes unstable angina and acute myocardial infarction. Atherosclerosis is the major source of mortality in the developed countries, claiming more lives than all types of cancer combined. WHO predicts atherosclerosis to become an epidemic in developing countries like India in coming years as it acquires western lifestyles. Only few reports are available on the plasma proteome profile of ACS. In this study, we used STEMI patients and age and sex matched control subjects.

Methodology & Theoretical Orientation: We used nano LC-MS orbitrap mass spectrometer and SWATH-MS to annotate proteins and identify differential expressions between control and ACS samples respectively. We used GeneCodis 3.0 and PANTHER for pathway enrichment analysis.

Findings: Using nano LC-MS orbitrap mass spectrometer we identified ~3000 proteins from control and STEMI patients respectively. We also performed SWATH-MS to identify differential expressions of proteins, if any. 65 proteins (27 downregulated, 38 upregulated) show differential expressions between control and STEMI patients. Some protein expression patterns were validated using western blotting and ELISA to look into the molecular detail. Here we intend to focus on the reverse cholesterol transport (RCT) pathway.

Conclusion & Significance: We found downregulation of ZAG, a novel adipokine in ACS patients from SWATH and validated using western and ELISA. Upregulation of a novel ATP binding cassette transporter, ABCA5, was observed in STEMI using orbitrap-MS. We show here that these might be responsible for the alteration in reverse cholesterol transport pathway during ACS which has a great impact on atherosclerotic pathway.



Biography

Kamalika Roy Choudhury did her PhD from SINP, India on Cell Biology and Proteomics of Huntington's disease. She is currently working on cardiovascular translational research; looking for proteomic alterations and post translational modifications during acute coronary syndrome.

withkamalika@gmail.com