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**Non-Invasive Diagnostic Signatures and Phytotherapeutics for Breast Cancer
Evaluation of Vis-BUS****Abstract:**

Breast cancer ranks as the second most common cause of mortality among women. Timely detection and suitable treatment, accompanied by diligent monitoring, are crucial in minimizing the impact of this fatal disease. In the present study, we aimed to identify biomarkers that could assist in early and non-invasive breast cancer diagnosis. We isolated the exosomes from the saliva of HER-2-positive breast cancer patients with grade II ductal carcinoma and performed comparative proteomics using label-free LC-MS. Through comparative proteomics, we observed that most of the differentially expressed proteins (DEPs) were involved in the regulation of enzyme activity, binding with actin filament, regulation of various signalling pathways (VEGF and IL-17 signalling), and neutrophil extracellular trap formation, validated through Western blotting. The obtained salivary biomarkers could be employed in the early diagnosis of HER2-positive breast cancer. Further, towards a therapeutic, we investigated inhibitory effects of *Acorus calamus* extract on exosome secretion from breast cancer cells. Our approach involved targeting Rab27a and nSMase2 (neutral sphingomyelinase). We observed that treatment with *A. calamus* significantly downregulated the expression of Rab27a and nSMase2 in all tested breast cancer cells (MDA-MB-453, MCF-7, and MDA-MB-231). These findings suggest that *A. calamus* could inhibit exosome secretion, potentially paving the way for cancer therapeutics. In conclusion, we identified salivary exosome proteins as potential biomarkers for early detection of HER2-positive breast cancer. We also found that the aqueous extract of *Acorus calamus* downregulated Rab27a and nSMase2 in breast cancer cells, leading to reduced exosome secretion compared to the control group.

Biography: Dr. Ashok Kumar Patel is an Associate Professor at the School of Biological Sciences. He earned his Ph.D. from Banaras Hindu University. Dr. Patel has specialized knowledge in biology, with a strong focus on molecular and structural biology, biophysics, and biochemistry. His expertise encompasses chromatin dynamics and its link to diseases, epigenetic regulation, chromatin remodeling, and the mechanisms underlying transcriptional activation and elongation. Additionally, his research includes gene silencing in cancer, DNA replication, recombination, repair, and gene expression. Dr. Patel also investigates histone modifications and the roles of histone deacetylases (HDACs) and other chromatin remodeling factors in regulating the development and function of the heart, muscle, and brain. His work explores the actions of HDAC inhibitors in various developmental and pathological processes.