

Notification No.: COE/Ph.D./(Notification)/521/2022

Date of Award: 30-08-2022

Name of the Scholar: Taj Mohammad

Name of the Supervisor: Dr. Md. Imtaiyaz Hassan

Name of the Centre: Centre for Interdisciplinary Research in Basic Sciences

Topic of Research: High-throughput analysis of genomic alterations and differential gene expression in prostate cancer

Finding

Prostate cancer remains one of the major challenges for scientists in the modern world to deliver an effective and novel therapeutic application. Genomic profiling of genetic alterations and analysis of expression patterns helps understand prostate cancer's complexity in different individuals. We implemented a comprehensive approach to get insights into the biological heterogeneity and genomic characterization of prostate cancer. A high-throughput dataset containing 459 cancerous and 50 normal profiles from TCGA was retrieved to analyze using an integrated computational approach. We have carried out differential expression analysis along with construction of protein-protein interaction networks of DEGs. We have elucidated STAT6 and SOX2 from the initial datasets and four kinases, SGK1, SRMS, NRK, and EPHA8, overexpressed in prostate cancer. Then, we carried out a comprehensive investigation of genomic profiles of prostate cancer patients to study their genetic make-up and different mutations. The analysis showed that the survival of the patients was found to be effectively reduced where the elucidated genes were altered. Also, we used structure-based virtual screening of natural compounds against SGK1 and discovered a bioactive compound ZINC00319000 with appreciable drug-like characteristics. Applications of this work may reflect in early detection and diagnosis of prostate cancer, personalized treatments, drug development, etc.