Oral cancer identification candidate genes by integrated Protein-Protein interaction and Systems biology approach

Keerti Kumar Yadav*, Ajay Kumar Singh

Central University of South Bihar - Gaya (Bihar) 824236, India

*Corresponding author

ABSTRACT

Oral cancer is a common type of Head and Neck cancer that affects large population of the world. Presently its stands 16th position in the world and 1st position in India in all types of cancer and day by day disease taking dangerous form, hence its early identification and prevention is very important. In recent years bioinformatics play the significant role in identification of the candidate genes identification. The protein-protein interaction (PPI) studies and gene ontology study are helpful for extracting the candidate oral cancer genes. The objective of current study is identification of oral cancer targets through network based protein-protein interaction approach and systems biology based analysis. The total 232 oral cancer genes were retrieved from the Oral Cancer Gene Database (OrCGDB). Networks constructed for oral cancer genes were performed by the help of STRING database. These protein-protein networks are studied by the Cytoscape v3.7.2 systems biology tool. Topology study has been performed with the help of Molecular Complex Detection Tool (MCODE) and the Biological Network Gene Ontology Tool (BiNGO) Plugin of Cytoscape v3.7.2 software. Comparative study yields the 8 significant number of gene clusters.

Based on the network analysis and gene set enrichment analysis of these 8 cluster genes shows that these genes play an important role in oral cancer and may be considered as potential oral cancer targets. Network base interaction analysis between these cluster proteins can be one of the potential solutions as anti-cancer drug molecules against multiple targets of various cancers including oral cancer.

Keywords: Oral Cancer, Systems Biology, Protein-Protein Interaction, Gene Ontology.

