

Analysis of Protein Interaction Network for Colorectal Cancer

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Abstract. In this paper we create and analyze a protein-protein interaction network (PPIN) of colorectal cancer (CRC). First we identify proteins that are related to the CRC (set of seed proteins). Using this set we generate the CRC PPIN with the help of Cytoscape. We analyze this PPIN in a twofold manner. We first extract important topological features for proteins in the network which we use to determine CRC essential proteins. Next we perform a modular analysis by discovering CRC significant functional terms through the process of GO enrichment within densely connected subgroups (clusters) of the PPIN. The modular analysis results in a mapping from the CRC significant terms to CRC significant proteins. Finally, we combine the topological and modular evidence for the proteins in the CRC PPIN, exclude the initial seed proteins and obtain a list of proteins that could be taken as possible bio-markers for CRC.

Keywords: colorectal cancer, protein-protein interaction network, network analysis, gene ontology, clustering, cytoscape.