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A gene co-expression network (GCN) is an undirected graph, where each node corresponds to a gene, and a pair of nodes is connected with an edge if there is a significant co-expression relationship between them.

Having gene expression profiles of a number of genes for several samples or experimental conditions, a gene co-expression network can be constructed by looking for pairs of genes which show a similar expression pattern across samples, since the transcript levels of two co-expressed genes rise and fall together across samples. Gene co-expression networks are of biological interest since co-expressed genes are controlled by the same transcriptional regulatory program, functionally related, or members of the same pathway or protein complex.



The direction of edges is overlooked in gene co-expression networks. While three genes X, Y and Z are found to be co-expressed, it is not determined whether X activates Y and Y activates Z, or Y activates X and Z, or another gene activates three of them.

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Last update: 2024/06/07 02:58