

عنوان مقاله:

Integrate multi-Omics data using method based on matrix factorization

محل انتشار:

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خلاصه مقاله:

Nowadays, with the development of technology in the biological sciences, it has been possible to measure more characteristic of cellular components. A comprehensive evaluation of the function and communication of each cellular component in systems biology is called Omics. The layers of genomics, proteomics, transcriptomics, etc. are not separate from each other and there are fundamental interactions between these layers, but due to the extent and complexity of biological systems, studies have so far been done on only one Omics layer, and the results of modeling only have described a limited part of a biological system. With the development of various forms of matrix factorization methods, it has been possible to integrate data of the Omics layers together for modeling molecular networks. In this paper, we proposed a method for multi-Omics data integration using method based on matrix factorization. This modified matrix factorization method predict the interactions between heterogeneous molecules. In this regard, two data set of Omics layers, gene expression and Protein-Protein Interaction which are experimental data, have been used to validate the proposed method. By applying matrix factorization methods on the data matrix, a nonlinear model is obtained that not only reduce large size and complexity of data, but also finds latent components of data in order to model the complex statistical relationships between gene interaction network and expression data.

کلمات کلیدی:

Omics integration, interaction prediction, Matrix factorization, Data fusion

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