

## **Analysis of complex disorders from the systems biology perspective.**

**Keywords:** system – heritable disorders – networks – data integration –

**Abstract:** Understanding of genetic mechanisms underlying common heritable disorders (e.g. autism, schizophrenia, diabetes) is one of the most important challenges of biology. These disorders display complex patterns of inheritance and result from many genetic variations, each contributing weak effects to the disease phenotype. Recent advances in biology provided new perspectives onto studies of complex heritable disorders, including: networks-based view of Human disorders; emergence of phenomics and a notion of interrelatedness of disease traits. However, the progress of biomedicine facilitated by these approaches depends on availability of the new bioinformatics platforms supporting the development of integrative models of genetic disorders and identification of their characteristic multidimensional patterns of inheritance. We present an approach and a supporting computational platform GEDI (<http://gedi.ci.uchicago.edu/>) for analysis of common heritable disorders from the systems biology perspective. An approach is based on a large-scale integration of experimental data as well as disease-dependent and disease-independent information from variety of public and proprietary databases and information derived from the literature using advanced text mining. GEDI also contains tools and algorithms for analysis and mining of the data. Reconstruction of molecular networks for the prediction of genetic factors contributing to infantile spasms will be used as an example of GEDI functionality.

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