

Title: Structural similarity of metabolic networks by graph spectra.

Abstract: Many methods have been developed to study phylogeny between different species. The structure of metabolic network also reveals important insights into metabolic capacity of species as well as into the habitats where they have evolved. Horizontal gene transfer brings two species, which have evolved in similar environmental condition or lifestyle, close to each other in phylogenetic study based on metabolic network topology. Here, we construct metabolic networks of 79 fully sequenced organisms and compare their architectures. We use spectral density of normalized Laplacian matrix for comparing structure of networks. The eigenvalues of this matrix not only reflects the global architecture of a network, but also the local topologies which are produced by different graph evolutionary processes like motif duplication or joining. In our analysis we show more interest on the species, who belong to different classes but come in the vicinity of each other in phylogeny. With this focus, we reveal interesting insights into the phylogenetic commonality between different organisms.

*It is to be in the mini symposium on Complex Networks.