

# In search of the biological significance of modular structures in protein networks

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It is easy to observe that many networks naturally divide into communities or modules, where links within modules are stronger and denser than those across modules – like the way people from the same age group tend to interact more with each other than with people from different age groups. It is widely believed that networks within cells are modular in much the same way. Drs Zhi Wang and Jianzhi Zhang, from the University of Michigan, now investigate these modular properties and conclude that they may be only a random byproduct of evolution, and not functional at all.

The modules of cellular networks were thought to be formed in a way that reflects the relative independence and coherence of the various functional units in a cell – each module serves a function. This investigation, published in the Open Access journal PLoS Computational Biology, now suggests that the structural modules in the yeast protein-protein interaction network may have originated as an evolutionary byproduct without much biological significance.

There is little evidence that the previously observed structural modules correspond in any way to functional units. It seems that previous analyses may have even created some of these modules through the techniques used to investigate protein properties. Refuting previous studies, the authors now show by computer simulation that modular structures can arise during network growth via a simple model of gene duplication, without a natural selection preference for modularity.

Source: Public Library of Science

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