

Abstract Submitted  
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**The local structural organization of metabolic networks** HA-  
WOONG JEONG, KAIST, YOUNG-HO EOM, KAIST, COMPLEX SYSTEMS  
AND STATISTICAL PHYSICS LABORATORY TEAM — Metabolic networks  
share global statistical features. Their connectivity distributions follow a long-tailed  
power-law and they show the small-world property. In addition, their modular struc-  
ture is organized in a hierarchical manner. Although the global topological organi-  
zation of metabolic networks is well understood, local structural organization is still  
not clear. It is also necessary to understand local properties of metabolic networks  
for analysis of metabolism. Here, by analyzing subgraphs of metabolic networks of  
43 organisms from three domains of life and using the significance profile of sub-  
graphs, we identified the local structural organization of metabolic networks. We  
identified network motifs, which are statistically significant subgraphs patterns, of  
metabolic networks. We also showed that metabolic networks from different domains  
have similar local structure. And we found that local structure of each metabolic  
network has its own taxonomical meaning. The closer in taxonomy, the more similar  
local structure. In addition, we found that the common substrates of 43 metabolic  
networks are not randomly distributed but more likely to be constituents of more  
cohesive subgraph patterns.

Hawoong Jeong  
KAIST

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