

ANALYSIS OF THE ENZYMATIC NETWORK

Avanthi Mummaneni

Dr. Toni Kazic, Thesis Supervisor

ABSTRACT

A biochemical network is very large, complex system with very diverse components. In order to study the behavior of networks, the first step is to study their architecture. Studying network architecture raises many basic questions about its connectivity. In order for me to answer all these questions, I was embarked on the task of building a biochemical network. The Enzyme Nomenclature Database (END) contains information on all systematically classified enzymatic reactions.

The data of END represent a basic notion of a biochemical network. I did various calculations and implemented several algorithms to study the architecture of the network of these enzymatic reactions in END. Most of the reactions in the network have reactive conjunction degrees of four and five and most compounds are connected to only one reaction. The network can be connected into a single large component by compounds of low degree. There are more branched regions in the network than simple straight paths. There are many more regions densely connected internally than their immediate context.