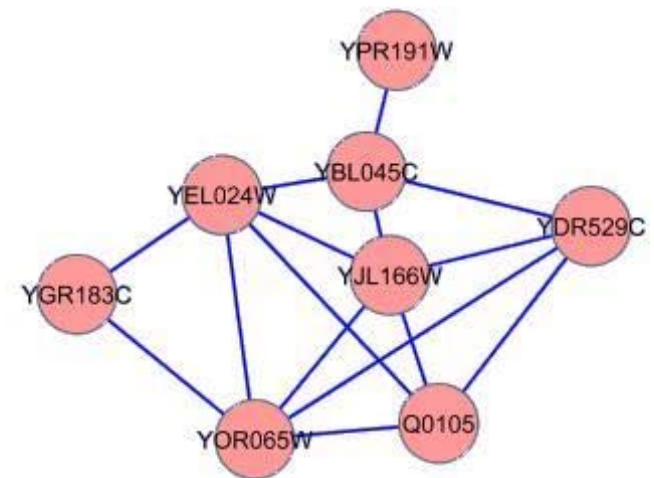


Subgraphs of Protein-protein Interaction Networks with High Connectivity

Suzanne Gallagher and
Debra Goldberg

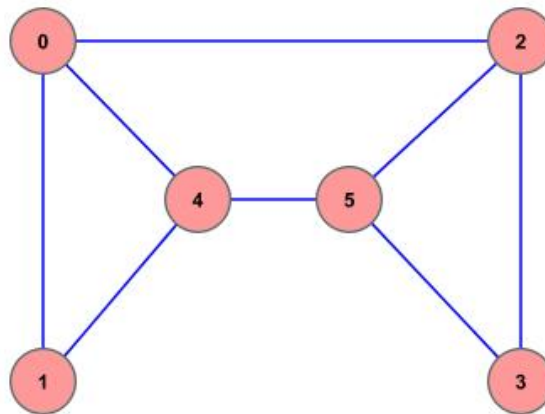
Protein-Protein Interaction Network

- Experimentally determine which proteins can bind together.
- Use this information to build a graph.
- Vertices: Proteins
- Edges: Interactions



Connectivity in Graphs

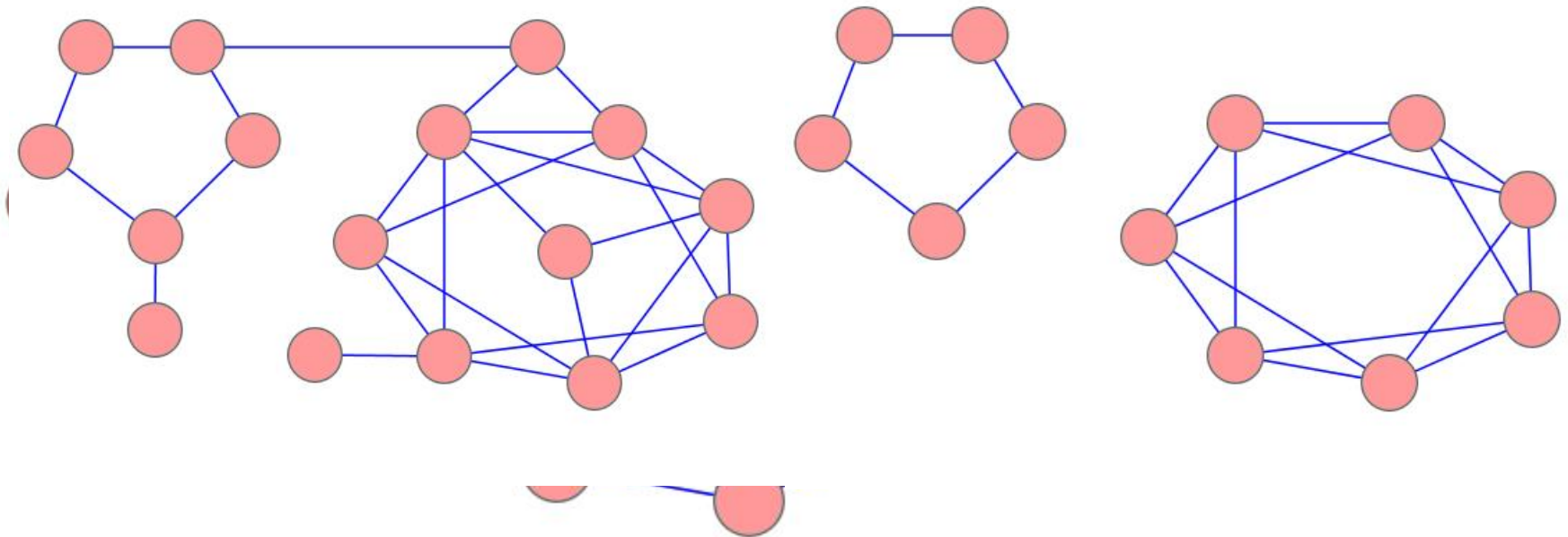
- A graph is *connected* if there is a path between any two vertices.
- The idea of connectivity can be extended to k -connectivity for any integer k .
- Two variants:



~~k-edge connectivity:~~
~~k disjoint paths~~
~~through any of the vertices.~~
intermediate vertices.

Connectivity in the PPI network

- Want to look for subgraphs with high connectivity values:



Connectivity in the PPI network

- Want to look for subgraphs with high connectivity values:
- Are these highly connected subgraphs biologically significant?
 - In complexes: 3- or 4-connected subgraphs.
 - In overall graph: several subgraphs seem significant.

Subgraphs with high connectivity

- 9 proteins, 6 connected
- 49 proteins, 16 connected
- 8 of 9 are in DASH complex (10 total)
- 7 membrane proteins
- Significance?

