

## Co-expression network analysis exercise

- Start Gephi and open coexpression\_network\_random\_start.gexi
- Run “Layout” → Fruchterman Reingold → Speed 10.0
- Run “Average degree”, “Network diameter”, “Modularity” in the Statistics tab in the right panel.
- Color nodes by “modularity class”:  
Appearance → Nodes → Partition → Palette Icon → Modularity class
- Size nodes first by “degree”.  
Appearance → Nodes → Ranking → Multiple Circles Icon → Degree
  - If the nodes are too small, select “Min size”: 10 and “Max size”:80
  - Nodes in large tightly connected clusters have large degree
- Then size nodes by “betweenness-centrality”  
Appearance → Nodes → Ranking → Multiple Circles Icon → Betweenness-centrality
  - Large circles are “coordinator” genes connecting different co-expressed clusters to each other. Potentially biologically interesting

## Disease network analysis exercise

- Start Gephi and open disease\_disease\_random\_start.gexi
- Run “Layout” → Fruchterman Reingold → Speed 10.0  
See how clusters emerge.
- Run “Average degree”, “Network diameter”, “Modularity” analysis tools in the right panel.
- Color nodes with medical term: “disorder class”  
Appearance → Nodes → Partition → Palette Icon → Disorder class
- Then color nodes by “modularity class”. See how well it agrees with the previous color.  
Appearance → Nodes → Partition → Palette Icon → Modularity class
- Size nodes first by “degree”.  
Appearance → Nodes → Ranking → Multiple Circles Icon → Degree
  - If the nodes are too small, select “Min size”: 10 and “Max size”:80
  - Nodes in large yet tightly connected clusters have large degree
  - **What are the disease hubs?**  
To find out use cursor with question mark, click on the node and see information in “Edit” panel at the top left side.
- Size nodes by “betweenness centrality”  
Appearance → Nodes → Ranking → Multiple Circles Icon → Degree
  - Large circles mark “coordinator” nodes connecting different disease types to each other. Potentially interesting connections between diseases
  - **What are the most betweenness-central diseases?**  
To find out use cursor with question mark, click on the node and see information in “Edit” panel at the top left side.