**Post Genomics – Fall 2025**

**Homework 5**

**Due: Thursday, October 2, 2025**

**Part 1. Protein-Protein Interaction Networks. (Non-Programming)** *(60 points)*

1.1 Use the CSV (AML\_gene.csv), to determine, create a list, of the unique genes within this dataset. Submit these genes into String-DB for the Protein-Protein Interaction Network:

<https://string-db.org/cgi/input?sessionId=byv6kGAGpNla&input_page_active_form=multiple_identifiers>

1.2 Under the Analysis Tab,

1.2.1 Take a screen shot of the Network Stats

1.2.2 For each Gene Ontology terms (Biological Process, Molecular Function, and Cellular Component) what is the top strength term? What is the count of network for each of these terms?

1.2.3 The format is #A of #B, what does #A represent and what does #B represent?

1.2.4 What is the top strength KEGG pathway? What is its count of network? Click the link for the pathway and submit a screen shot of the pathway.

1.3 Under the Exports Tab,

1.3.1 Download the “protein node degrees” file. How many proteins are there that have a node degree above the found average from the Network Stats?

1.3.2 Download the “as short tabular text output” file. Within this file, what information contributes to the Combined Score? What is the highest combine scored interaction?

1.4 Under the Settings Tab,

1.4.1 Submit a screen shot of the network as is.

1.4.2 Select the “hide disconnected nodes in the network” and update the network with this feature. Submit a screen shot of the new network.

1.4.3 In your own words, what changes did you observe, if any.

**Part 2. Node Network Practice. (Non-Programming)** *(40 points)*

Using the figure below, answer the following questions (assume that each edge is of length 1).

Start

A picture containing indoor, wire, accessory, lamp

Description automatically generated

End

2.1 What is the longest path to get from the Start to End node? You can either: Draw by hand and submit image, edit image virtually on iPad/Computer, or give list of directionals (down, right, left, etc. )

2.2 How many edges are on the longest path?

2.3 Repeat 2.1 and 2.2 for the shortest path.

**What to Submit:**

1. **A single PDF with responses and screen shots from Part 1 and 2. (Your Last Name) \_HW5.pdf *\*\* Submit on Blackboard \*\****