

Exercise #1

1.1 - Single protein query

We will first retrieve a STRING network for human insulin receptor (INSR). Go to <https://string-db.org/>, open the **Protein by name search interface**, and type **INSR** in the field **Protein Name**. You can either specify Homo sapiens in the Organism field leave it on auto-detect. Click **SEARCH**. If you specified the organism, you will immediately receive a protein network; otherwise you will first be presented with a disambiguation page on which you can specify that you meant the human protein.

1.2 Visual representations

The STRING web interface provides several different visual representations of the network. The **Settings** tab below the network view allows you to change between different visual representations of the same network. Try changing between the confidence and evidence views; do not forget to press the **UPDATE** button.

- *Which information is shown for the edges in each representation?*
- *Why are there sometimes multiple lines connecting the same two proteins in the evidence representation?*

1.3 Evidence viewers

A key feature of the STRING web interface is the evidence viewers. One should not rely purely on the confidence scores; it is important to inspect the actual evidence underlying an interaction before relying on it, for example, for designing experiments.

- *Which types of evidence support the interaction between insulin receptor (INSR) and insulin receptor substrate 1 (IRS1)?*

Further detail on the evidence of an interaction can be seen in a popup by clicking on the corresponding edge in the network. Click on the edge between INSR and IRS1 to view its popup; you may need to move the nodes to make this easier.

- *Which type of evidence gives the largest contribution to the confidence score?*

Click on the Show button to view the experimental evidence for the interaction.

- *Which types of experiments support this interaction?*

1.4 Query parameters

The Settings tab also allows you to modify detailed parameters for the search, such as the types of evidence to use (active interaction sources), the minimum required interaction score, and the max number of interactors to show.

Change the minimum required interaction score to high confidence (0.700).

- *Does this change the set of proteins shown? Does it change the interactions shown?*

Turn off all evidence types except experiments.

- *Does this change the set of proteins shown in the network?*

Increase the max number of interactors to show to 20.

- *How many interaction partners of INSR do you get in the network?*

Change the minimum required interaction score back to 0.400.

- *How many INSR interactors do you now get?*

Turn on all evidence types back on.

- *Does this change the set of proteins shown in the network?*