miRNet 2.0 Tutorial 1

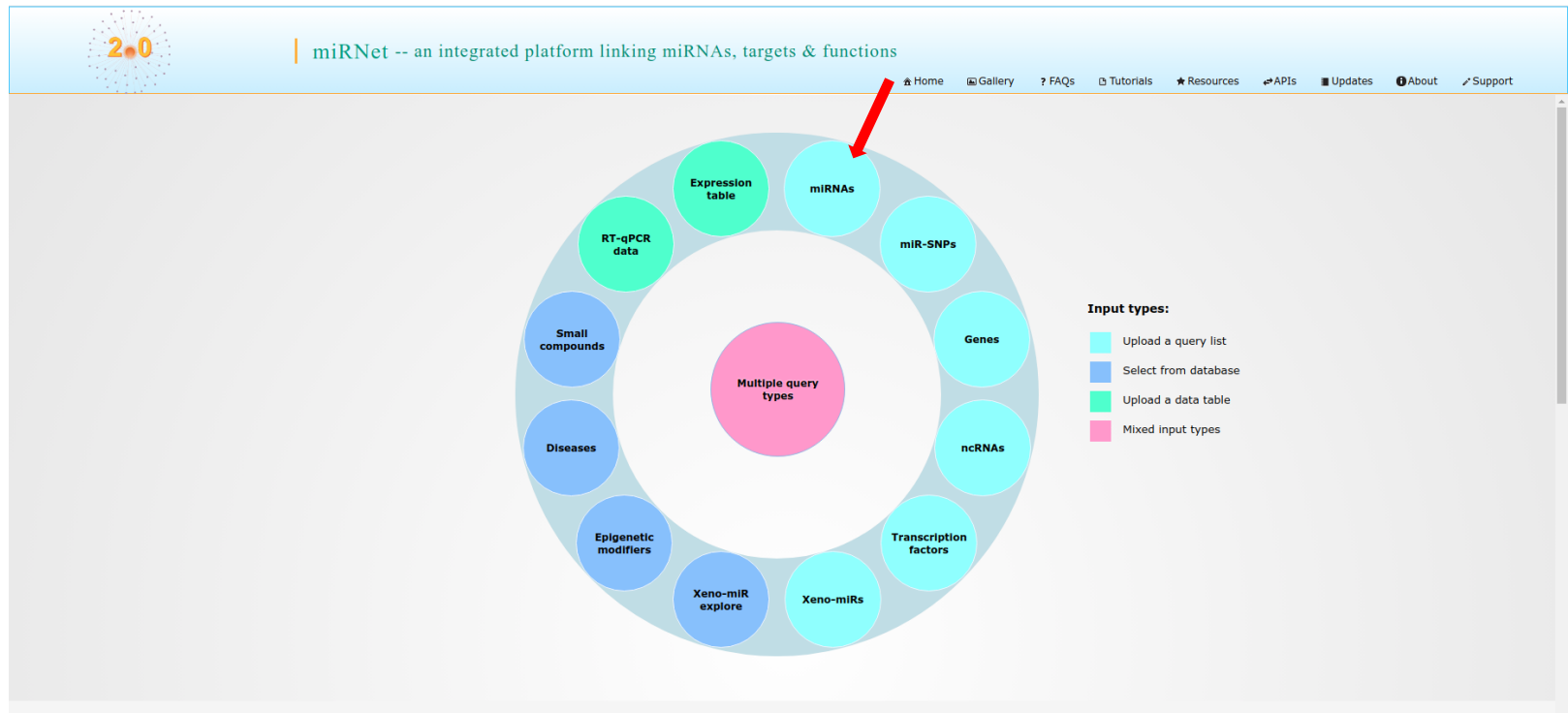# Starting from a list of microRNAs with multiple targets

Computer and browser requirements

- A modern web browser with JavaScript enabled
  - Supported browsers include Chrome, Safari, Firefox, and Internet Explorer 9+
- For best performance and visualization, use:
  - Latest version of Google Chrome
  - A computer with at least 4GB of physical RAM
  - A 15-inch screen or bigger (larger is better)

Goals for this tutorial

- How to create a tripartite network from a list of miRNAs
- Network customization and visual exploration

Choose a module

Go to the miRNet home page (www.mirnet.ca) and click "**miRNAs**" to enter the module

Data input

"Genes" and "lncRNAs" are selected in this analysis

Network creation

Network trimming for better visualization

Main functions in Network View

Customizing Network (I)

A lncRNA-miRNA-gene competing endogenous RNA (ceRNA) network. The blue nodes (central zone) represent lncRNAs, green nodes (middle layer) represent miRNAs and red nodes (outer layer) represent genes.

Customizing Network (II)

You can customize background color, node shape and label, edge color and opacity

You can select "Node type" (new feature) under "Scope" and drag to a separate area to further investigate.

Module detection & highlighting

Modules are tightly clustered subnetworks with more internal connections than expected by chance in the whole network. Members within a module are likely to work together to perform a biological function.

Exploring Enriched Biological Functions

miRNet provides four query types (all genes, highlighted genes, all miRNAs, highlighted miRNAs),
two enrichment algorithms (hypergeometric tests and empirical sampling), nine annotation libraries (three
gene-set libraries and six miRNA-set libraries) for functional enrichment analysis.

Path of interactions between queries

To identify interaciton partners between queries, click on "Path Finder"

Batch selection & highlighting

You can manually "Highlight" or "Delete" a list of nodes by using the "Batch Selection" feature

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