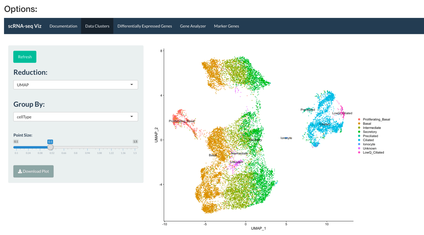
Documentation

Data Clusters

Explore various cell types with different dimension reductions or visualize our donors and treatments:

Options:



- Dimension Reduction Type: [PCA, TSNE, UMAP]
- Group By:
  - Cell Types: This will color the graph based on the nine major cell types we classified.
  - RNA_snn_res.0.XX: This will color the graph based on groupings produced by Seurat at various resolutions.
    - A higher value of XX means that there is a higher resolution, and therefore more clusters or inferred groups of cell types.
  - Donor: This will color the graph based on our four donors.
  - Treatments: This will color the graph based on five treatments (including untreated).
  - Treatment vs. Celltype: This will color the graph based on celltypes under various treatments

Differentially Expressed Genes

Explore the top N differentially expressed genes for various cell types and treatments:

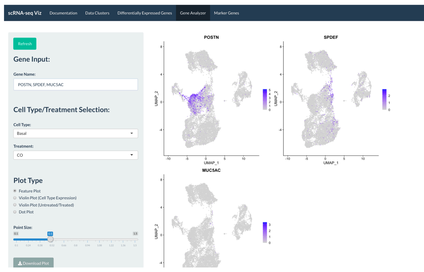
Options:

- Cell Type/Treatment Selection: This drop-down menu (if your plot is a heatmap, the celltype menu is a checkbox list) allows you to select which cell type and treatment combinations you would like to look at
- FDR/log2FC cutoff: These numerical values determine which how your top N genes are determined and filtered from the cellType/Treatment object
  - Down-regulated genes are genes that have lower gene expression with respect to the untreated data. Initially, both down and up-regulated genes are included.
  - The Include only Down-regulated Genes checkbox allows you view only down-regulated genes
  - The Include only Up-regulated Genes checkbox allows you view only up-regulated genes
- Number of Genes: This slider determines how many genes you would like to view
- Plot Type: This selection determines whether you would like to view your genes as a FeaturePlot, ViolinPlot, Heatmap, or a DotPlot

Gene Analyzer

Allow users to input interesting genes and visualize gene expression in various cell types and treatments:

Options:

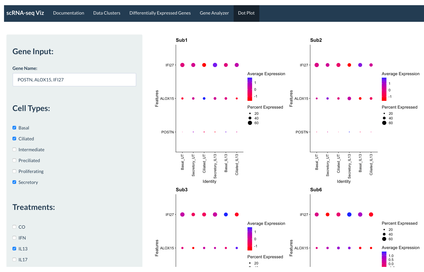


- Gene: This input bar allows you to input which genes you would like to look at. The required format is Gene1, Gene2, Gene3, ...
  - "HGNC" nomenclature genes and Gene symbols (i.e. not Ensemble ID etc.) are expected
- Cell Type/Treatment Selection: This drop-down menu allows you to select which cell type and treatment you would like to look at
- Plot Type: This selection determines whether you would like to view your genes as a FeaturePlot, ViolinPlot, or DotPlot
  - If your plot type is a dotplot, see below for further documentation

Dot Plot

Option Under Gene Analyzer Tab: Allow users to input interesting genes and visualize how they vary under different cell types, treatments and donors using dot plots:

Options:



- Gene: This input bar allows you to input which genes you would like to look at. The required format is Gene1, Gene2, Gene3, ...
- Cell Type Selection: These check-boxes determine which celltypes you would like to look at
- Treatment Selection: These check-boxes determine which treatments you would like to compare
  - If you check boxes for both cell-types and treatments, the dot plot will show combinations of celltypes vs. treatment
- Donor: This selection determines which donors you would like to look at. If none are checked, the default is expression in all donors

Heatmap

Option Under Gene Analyzer Tab: Allow users to input interesting genes and visualize how they vary under different cell types, treatments and donors using heatmaps:

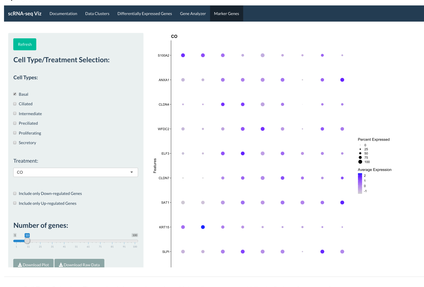
Options:

- Gene: This input bar allows you to input which genes you would like to look at. The required format is Gene1, Gene2, Gene3, ...
- Plot log2FC values: This check-box will plot a heatmap depicting log2FC values instead of gene expression.
  - Must have one treatment selection under various cell types for determinable log2FC values.
- Cell Type Selection: These check-boxes determine which celltypes you would like to look at
- Treatment Selection: These check-boxes determine which treatments you would like to compare
  - If you check boxes for both cell-types and treatments, the dot plot will show combinations of celltypes vs. treatment

Marker Genes

Allow users to identify top N marker genes for various cell types across other cell types under certain treatments

Options:



- Cell Type Selection: These check-boxes determine which celltypes you would like to find marker genes for
- Treatment Selection: This drop-down menu determines the treatment your celltypes are under
- Number of Genes: This slider determines how many genes you would like to view

For any further questions, feel free to contact Alex Sima at alex.sima@ucsf.edu