

# Supplementary Materials of canvasDesigner2

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## Web URLs of tools and online user guide

Google Chrome (<https://www.google.com/chrome>) is recommended for optimal use of the web-based tools.

canvasDesigner2: <https://baohongz.github.io/canvasDesigner2>

canvasDesigner2 source code: <https://github.com/baohongz/canvasDesigner2>

Example SVG files: <https://github.com/baohongz/canvasDesigner2/tree/gh-pages/SVG>

Inkscape: Tool to edit SVG files, convert image files from other formats to SVG format.

<https://inkscape.org>

pdf2svg: A simple PDF to SVG converter using the Poppler and Cairo libraries.

<https://github.com/dawbarton/pdf2svg>

SVGOMG: SVG Optimizer tool for optimizing SVG files. <https://jakearchibald.github.io/svgomg>

Coral: Clear and customizable visualization of human kinome data. <http://phanstiel-lab.med.unc.edu/CORAL/>

ComplexHeatmap: Complex heatmaps are efficient to visualize associations between different sources of data sets and reveal potential patterns.

<https://www.bioconductor.org/packages/release/bioc/html/ComplexHeatmap.html>

Wikimedia Commons: media file collection of 59.4 million freely usable media files to which anyone can contribute. [https://commons.wikimedia.org/wiki/Main\\_Page](https://commons.wikimedia.org/wiki/Main_Page)

WikiPathways: a database of biological pathways maintained by and for the scientific community.  
<https://www.wikipathways.org/index.php/WikiPathways>

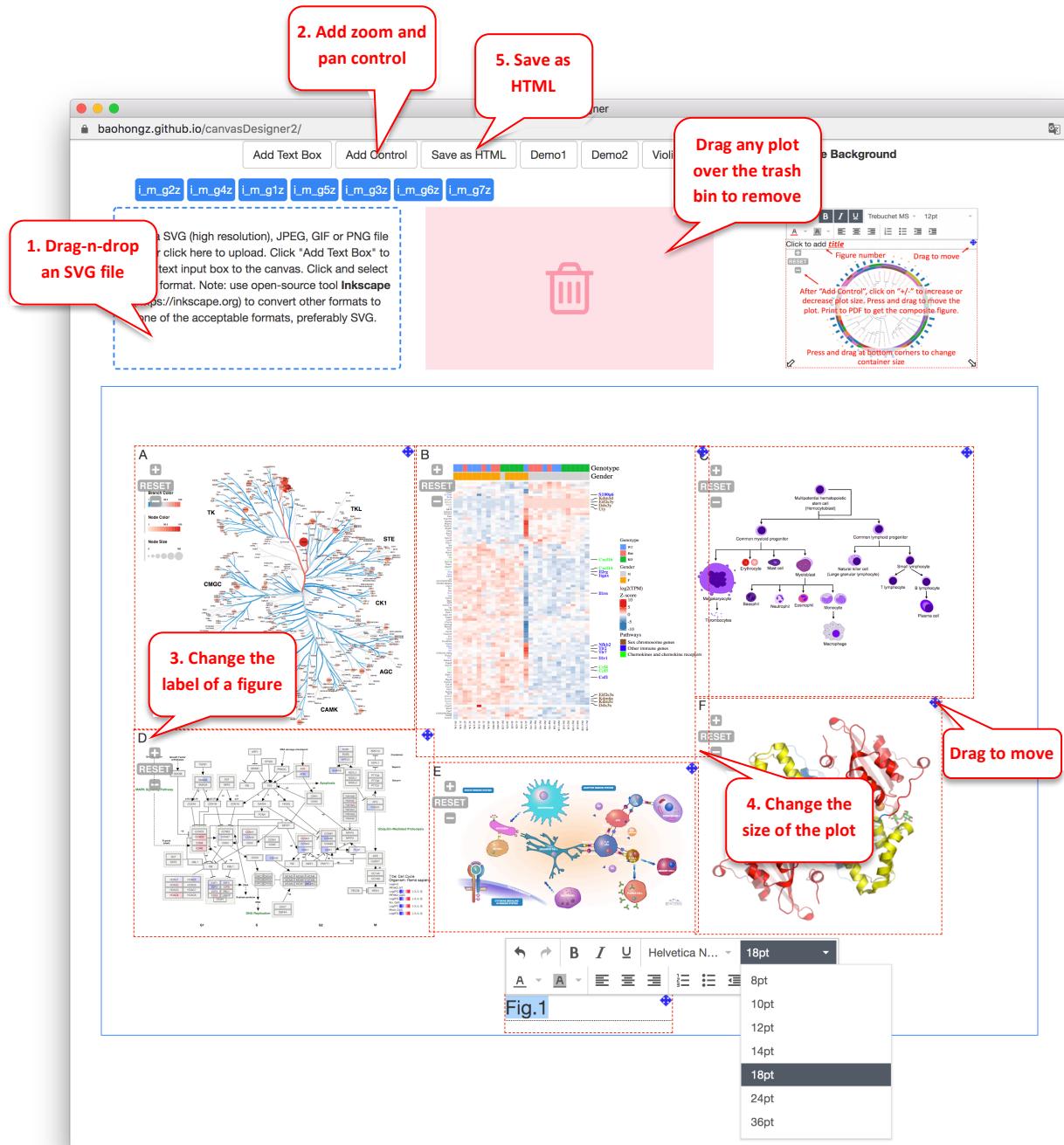
Reactome: a free, open-source, curated and peer-reviewed pathway database. Our goal is to provide intuitive bioinformatics tools for the visualization, interpretation and analysis of pathway knowledge to support basic research, genome analysis, modeling, systems biology and education.

<https://reactome.org/>

PyMOL: a user-sponsored molecular visualization system on an open-source foundation, maintained and distributed by Schrödinger. <https://pymol.org/>

## Laying out multiple SVG files by canvasDesigner2 (Fig. s1)

The HTML based tool `canvasDesigner2` can easily arrange multiple plots in SVG format exported by many tools. Each individual plot could be adjusted in size and positioned freely on the canvas.

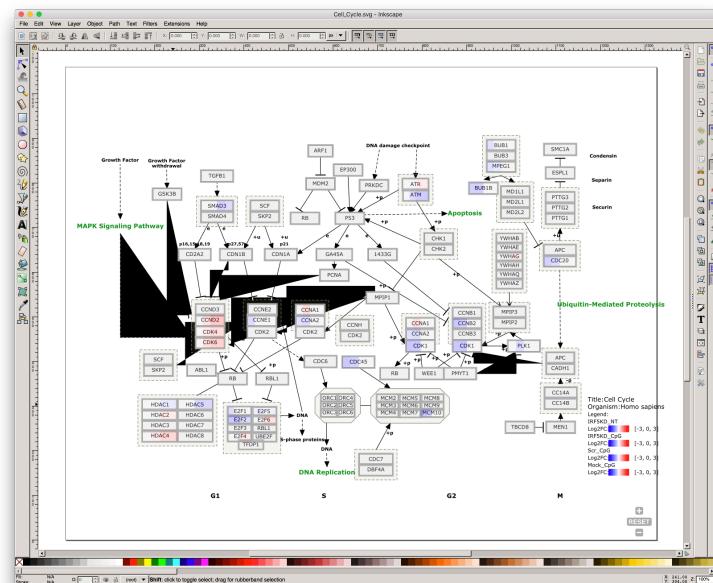


## Limitation of SVG rendering by other popular tools (Fig. s2)

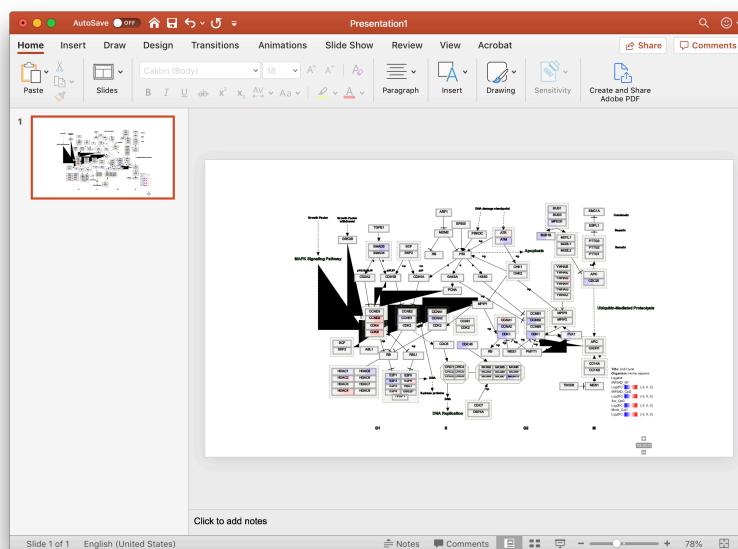
Rendering of some complex SVG files is flawed in many other tools, such as popular tools like open-source Inkscape and MS Power Point. Here is an example of pathway diagram

([https://baohongz.github.io/canvasDesigner2/SVG/Cell\\_Cycle.svg](https://baohongz.github.io/canvasDesigner2/SVG/Cell_Cycle.svg)) from Wikipathways rendered by Inkscape or MS Power Point. Please note unexpected black triangles generated by both tools. The same SVG file is rendered perfectly by canvasDesigner2 as shown in Figure 1D.

Inkscape

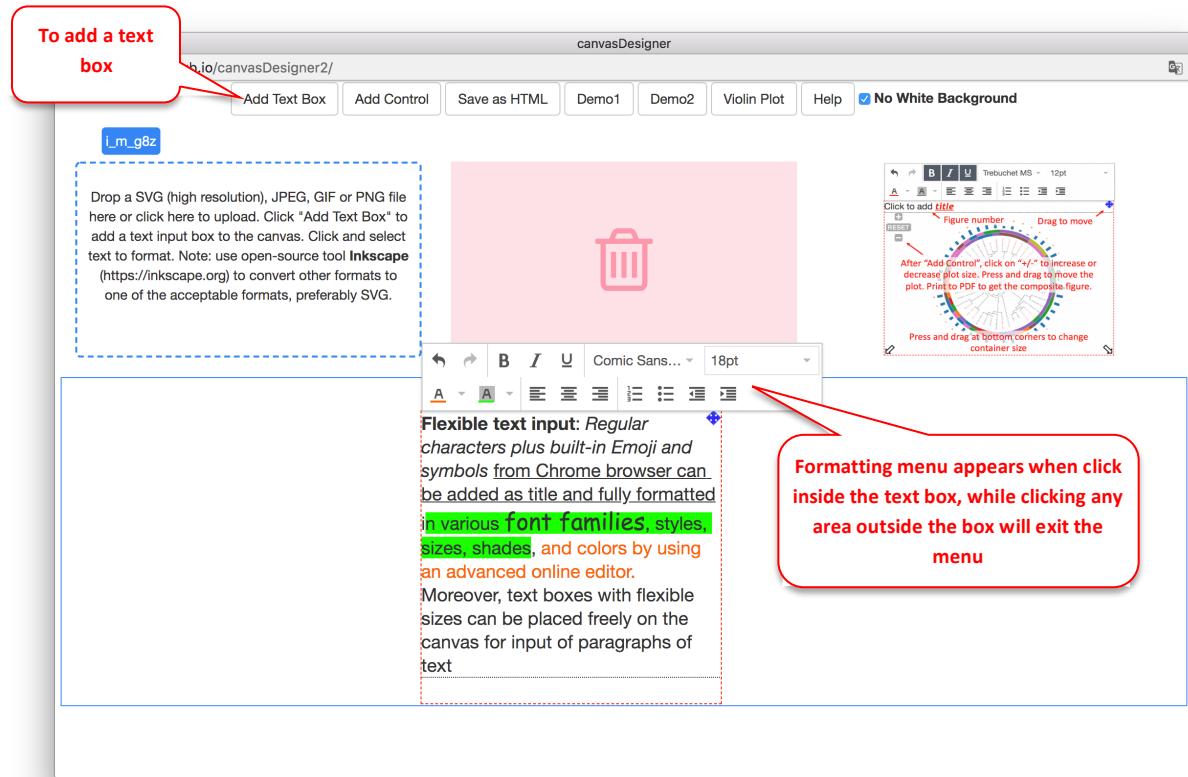


MS Power Point



## Flexible text input (Fig. s3)

Click on “Add Text Box” to add a box to the canvas. Selecting any text will fire up the formatting menu while clicking any area outside the box will exit the menu.



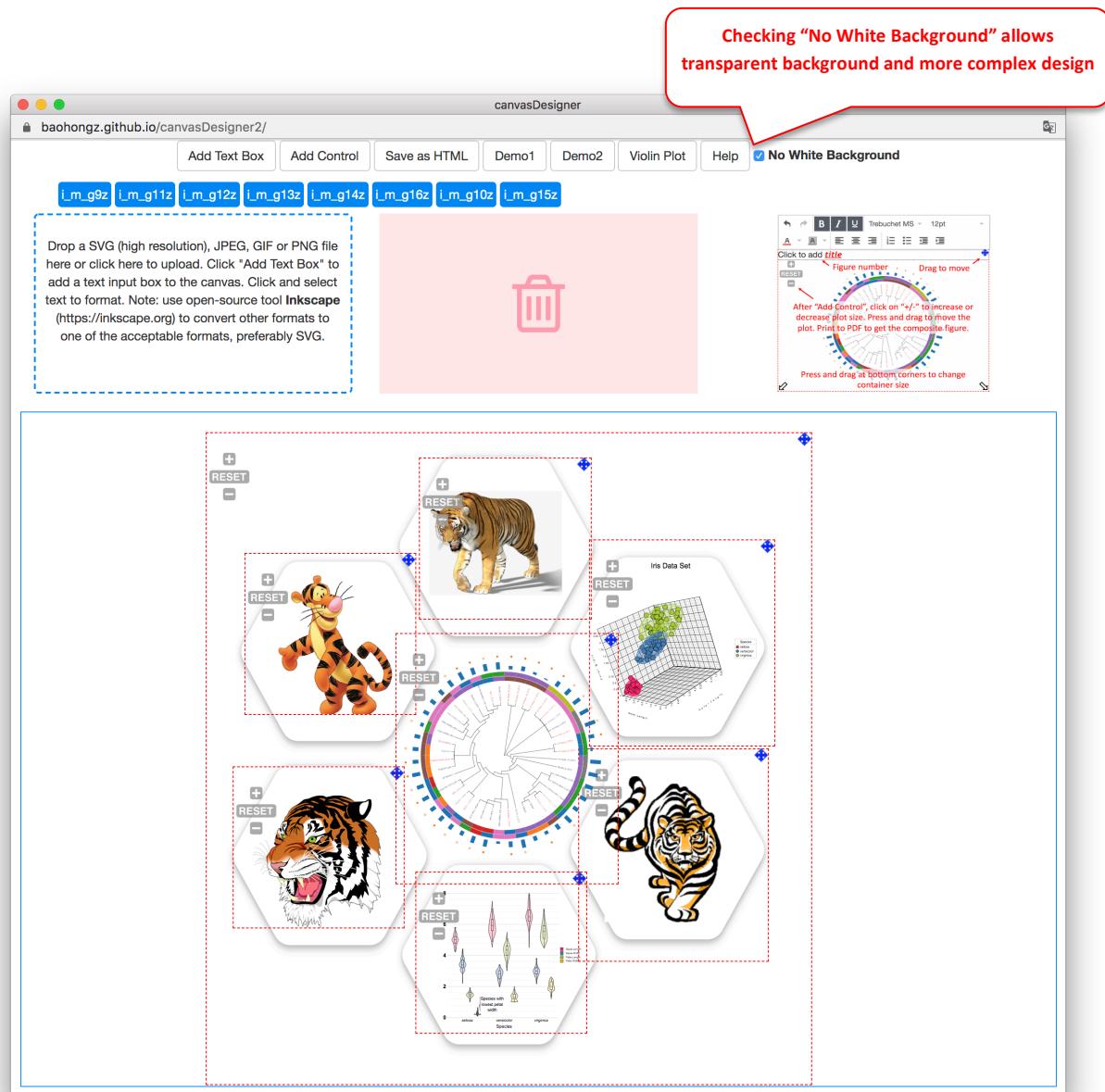
## Conflicting Stylesheets (Fig. s4)

Human blood cell lineage plot loses all of its colors due to the conflict of the stylesheet defined in heatmap plot in the older version (version 1) of canvasDesigner. Localization of stylesheets in new version solves the issue as shown in Fig. s1.



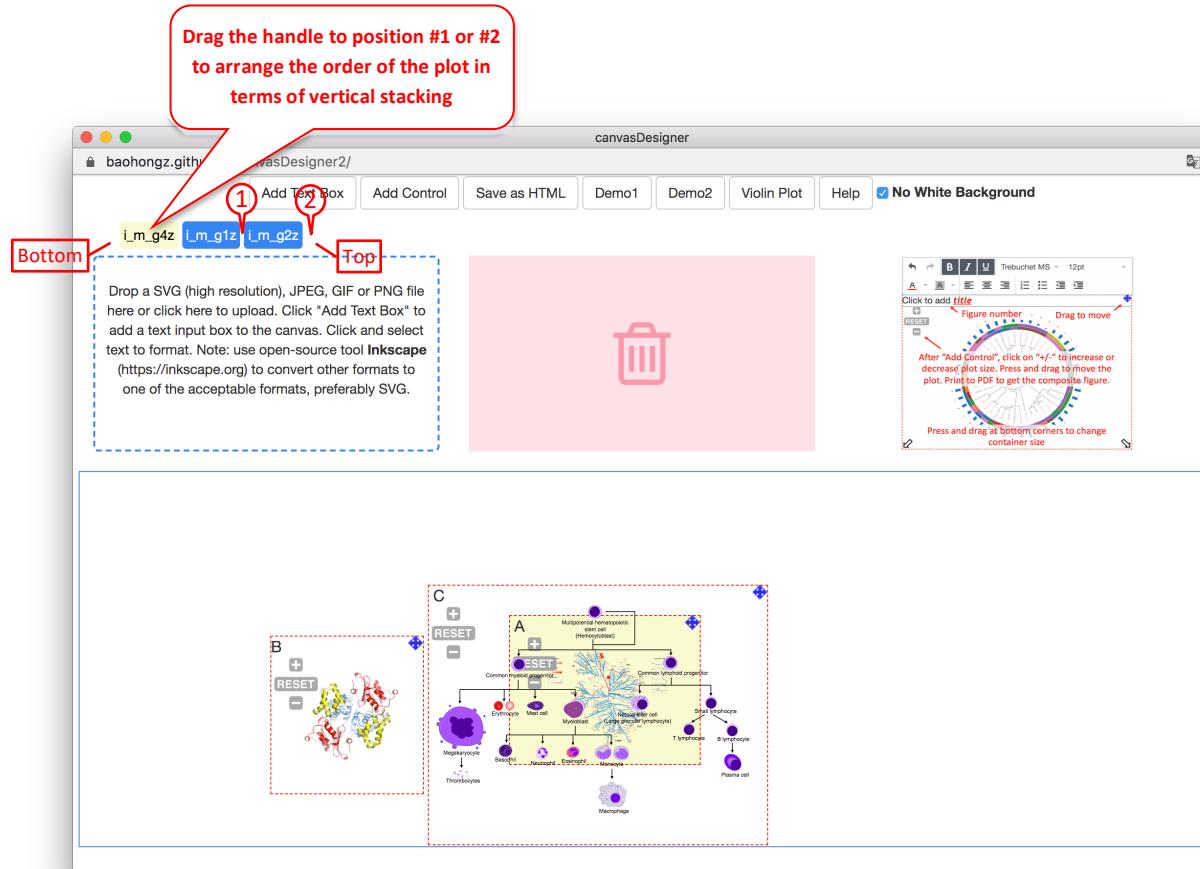
## Optionally removing white background (Fig. s5)

Overlaying plots onto each other to create more complex design is possible by optionally checking “No White Background” on the top menu. Moreover, images, tigers as example, in jpg, png, gif and svg formats can be loaded to the canvas directly for arrangement. The saved final HTML file is available at <https://baohongz.github.io/canvasDesigner2/figure/Fig.s5.html>.



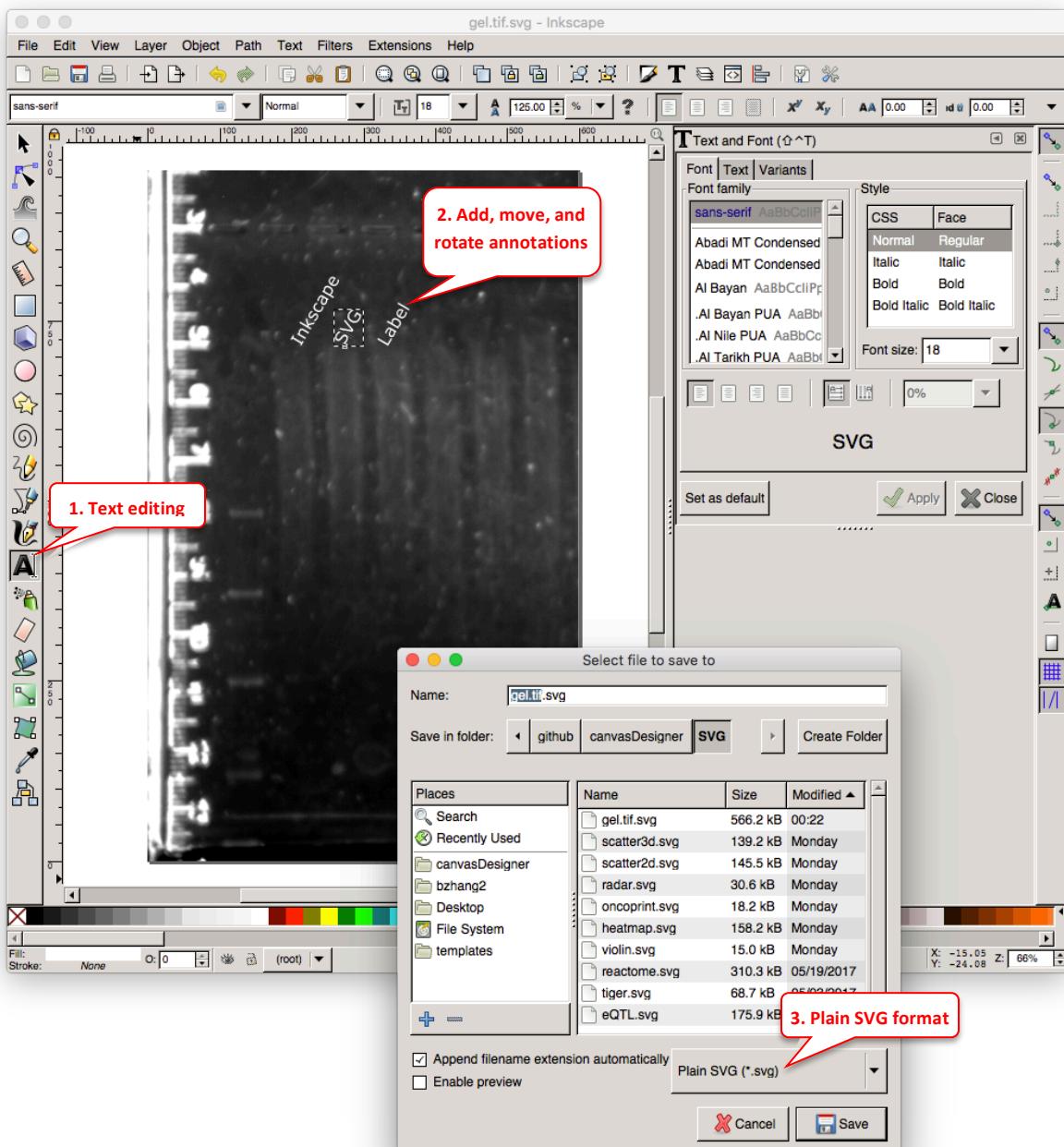
## Vertical stacking (Fig. s6)

Each plot will get a button handle when it is loaded onto the canvas. A plot and the linked handle will be highlighted in yellow when hovering mouse over the handle. Dragging the handle and dropping it at desired position among these buttons will change the relative vertical stacking, also known as z-index of the plot. The rightmost horizontal position represents the top layer of the stack of plots on the canvas.



## Inkscape to annotate and convert images to SVG if needed

Inkscape (<https://inkscape.org>) is a powerful open-source vector graphics editor. You can add text annotations to an image in jpeg, png, gif, or tiff format and save it as “Plain SVG” file to be used in canvasDesigner2 tool. The example here is showing how to add annotations to a TIFF image and then save as SVG format.



## Optimize SVG files by SVGOMG

SVG files, especially exported from various tools, usually contain a lot of redundant and useless information such as editor metadata, comments, hidden elements, default or non-optimal values and other stuff that can be safely removed or converted by the online tool SVGOMG (<https://jakearchibald.github.io/svgomg>) without affecting SVG rendering result.

The screenshot shows the SVGOMG interface with a scatter plot titled "Gene expression of TUFM". The y-axis is labeled  $\log_2(CPM+1)$  and ranges from 6.40 to 7.20. The x-axis is labeled "rs7187776" and has categories "High" and "Low". Data points are colored by SNP: AA (red), AG (blue), and GG (green). A legend indicates the color coding. The plot includes horizontal box plots for each category and a red trend line. On the right side, there are three red callout boxes with numbers 1, 2, and 3, each pointing to specific features:

- 1. Drag-n-drop a SVG file (points to the main plot area).
- 2. (Optional) Change optimization parameters (points to the "Precision" slider and the "Features" section).
- 3. Save (points to the download and save icons at the bottom right).

**Global settings**

- Show original
- Compare gzipped
- Prettify code
- Multipass

**Precision**

**Features**

- Cleanup attribute whitespace
- Remove/tidy enable-background
- Clean IDs
- Round/rewrite number lists
- Round/rewrite numbers
- Collapse useless groups
- Minify colours
- Round/rewrite paths
- Shapes to (smaller) paths
- Style to attributes
- Round/rewrite transforms
- Merge paths
- Move attrs to parent group
- Move group attrs to elements
- Remove comments
- Remove <desc>

3.24k - 72.62% saving