

Visualizing cell-cell communication using synthetic notch activated MRI

MRI Analysis Tools - Instructions

Generate Image Series for Analyses:

Horos (can be done in other similar software):

1. Find axial slices that correspond to tumor on mice.
2. Export dicom series as image series in .jpg format. Organize image series in separate subfolders.

Generating Intensity Profile Plots:

ImageJ:

1. Import image series. *File > Import > Image Sequence*.
2. Using the line tool, draw straight line across tumor, maximizing the amount of tumor covered by the line. Save ROI. *File > Save as > Selection*.
3. Run the StackProfilePlot.txt macro (**provided**). Adjust directory in .txt file. This macro will automatically generate plot profiles of gray values across the line for all slices in the image series. Data is exported as spreadsheet. *Plugins > Macros > Run*.
4. Select the data in the spreadsheet, and transpose the data onto LineValuesTemplate.xlsx (**provided**). Adjust template as needed to fit the data.

MATLAB:

1. Run LineProfile.m (**provided**). Adjust directories as needed. Code will automatically generate intensity profile plots for each spreadsheet selected.

Counting Bright Pixels:

ImageJ:

1. Import image series. *File > Import > Image Sequence*.
2. **Optional but helpful: Install the RoiManagerMacros.txt for keyboard shortcuts (<https://imagej.nih.gov/ij/macros/RoiManagerMacros.txt>).
3. Using the polygon tool (or another desired tool), draw ROI region around tumor. Add the ROI to the ROI manager (press "z" if using RoiManagerMacro). Repeat for desired slices (does not need to be every slice).
4. Automatically generate ROIs for missing slices. *ROI Manager > Options > Interpolate ROIs*. Scroll through ROIs and correct them if needed.
5. Run the GetHistogramValues.txt macro (**provided**). Adjust directory in .txt file. This macro will automatically extract the number of pixels at each gray value for each slice. and save all the Data is exported as spreadsheet. *Plugins > Macros > Run*.
6. Select the data in the spreadsheet, and transpose the data onto HistoValuesTemplate.xlsx (**provided**). Adjust template as needed to fit the data.

MATLAB:

1. Run BrightPixelCount.m (**provided**). Adjust directories as needed. This code will calculate the percentage of bright pixels (pixels above threshold calculated on corresponding pre-contrast image) across all slices. Threshold algorithm can be adjusted manually to desired needs.