**Projection of the apical/basal surface of the tissue**

Requirements

- Install **Fiji/ImageJ** (this pipeline was tested using ImageJ 1.51h, Java 1.8.0\_66 (64bit), website: <http://imagej.nih.gov/ij>)

- Install **Matlab** (this pipeline was tested using 2018b Matlab version

1. Input data and architecture of the input

Input data is a list of hyperstacks*(x,y,z)* stored in a single folder.

1. Preprocessing and degradation of the hyperstacks

In Fiji, run ‘1Preprocessing.ijm.

Indicate the path ‘Data’. In this folder, an example of hyperstack is shown (Phalloidin staining).

The program will enhance dynamic signal, remove background and degrade the image to generate a degraded version of each hyperstack in the output folder ‘TopoMapDetection’.

1. Projection *(calculation time for the provided example ≈ 1min)*

In Matlab, open ‘ProjectionApicalBasal.m’ and add ‘Function’ folder to Matlab path.

In the code, indicate the path ‘Data’.

This code will detect the first peak of fluorescence in each pixel of the degraded image stored in ‘TopoMapDetection’ (the default parameter ‘PeakThreshold’ is here adjusted to the example contained in ‘Data’) in order to detect the apical plane. The code will then project apical and basal surfaces using the detected apical plane (apical/basal plane are projected around the detected apical plane, thicknesses and positioning of the projected data relative to the detected apical plane can be adjusted in the parameters ‘ApicalShift1’, ‘BasalShift1’, ApicalShift2’ and ‘BasalShift2’)