1. **Instructions to pe**In 2nd Save Fiducial list as **Pre.fcsv** in *shared\_data/$subj/Processed/PreEx\_Reg/Neo/Init\_xfms*

**rform Rigid Ex-vivo *Neocortex* to Preop Fiducial Registration**

* Maged or Ali

Scripts dir: ~/epilepsy/local\_data/PreEx\_Reg/scripts

1. Make sure “*MRI\_PreExReg.nii.gz”* exists in shared folder of patient:

~ /epilepsy/shared\_data/**subj**/Ex/9.4T/Neo/

(copy “*MRI\_ExHistReg.nii.gz”* if there)

1. Run ***1.0\_InitRegExToPre*** <SUBJID> <structure> <session> <side>
2. Run ***1.1\_CopyInitToShared*** <SUBJID> <structure>

* Catherine

2- Perform Fiducial registration using Slicer4 (modules)

Load Files:

1. In one Slicer open (1st) **MRI\_PreExReg\_crop\_res0.4\_inm.nii.gz** in

Y:/*Patient/Processed/PreEx\_Reg/Neo/*

1. In another Slicer open (2nd) **T1map\_crop\_res0.4.nii.gz** in

*Y:/ Patient/Processed/PreEx\_Reg/Neo/*

**AND T1w\_fa18\_restore\_brain.nii.gz** in

*Y:/ Patient /Preop/Processed/TissueSegBiasCorrect*

Make Model:

1. In the 1st Slicer use the ***Greyscale model maker*** module
   1. Input Volume -> **MRI\_PreExReg\_crop\_res0.4.nii.gz**
   2. Output Geometry -> Create New Model
   3. Apply
   4. \*\*\*\*\* If model has many holes decrease the **threshold** value in the options.

Volume Rendering

1. In the 2nd use the ***Volume rendering*** module
   1. Volume -> **T1w\_fa18\_restore\_brain.nii.gz**
   2. Rendering -> **VTK GPU Ray Casting**

Fiducial Placement (Markups) -- Minimum 10 fiducials!

1. In the 1st use the ***Markups*** module
   1. Create New Markups Fiducials
   2. Rename Current Markups -> Ex
2. In the 2nd use the ***Markups*** module
   1. Create New Markups Fiducials
   2. Rename Current Markups -> Pre
   3. You can change their colour/size in Advanced options
   4. When placing fiducials on the ‘Volume rendering’ Surface make sure they are visible on the **T1map\_crop\_res0.4.nii.gz** volume and not in outer space!!
      1. Right click on fiducial-> Jump slices
   5. Make sure fiducials are corresponding on both images!
3. In 1st Save Fiducial list as **Ex.fcsv** in *shared\_data/$subj/Processed/PreEx\_Reg/Neo/Init\_xfms*
4. In 2nd Save Fiducial list as **Pre.fcsv** in *shared\_data/$subj/Processed/PreEx\_Reg/Neo/Init\_xfms*

Fiducial Registration

1. Load **Ex.fcsv** in 2nd **AND MRI\_PreExReg\_crop\_res0.4\_inm.nii.gz** in 2nd
2. Use ***Fiducial registration*** module:

Fixed: Pre fids

Moving: Ex fids

Save tfm: Sim\_Ex\_T1

Transform Type: Similarity

Image Registration

1. Use ***Resample Image (Brains)*** module
   1. Image To Warp: **MRI\_PreExReg\_crop\_res0.4\_inm.nii.gz**
   2. Reference Image: **T1map\_crop\_res0.4.nii.gz**
   3. Output Image Create New Volume / Rename current volume -> **Sim\_Ex\_T1**
   4. Warping Parameters->Transform File: **Sim\_Ex\_T1.tfm**
   5. Interpolation mode->**Bspline**
   6. Apply
2. save transform as: **Sim\_Ex\_T1.tfm** in *shared\_data/$subj/Processed/PreEx\_Reg/Neo/Init\_xfms*
3. save output image: **Sim\_Ex\_T1.nii.gz** in *shared\_data/$subj/Processed/PreEx\_Reg/Neo/Init\_images*

* Maged or Ali

3- Run 2.0\_RigidlyWarpToHist <SUBJID> <structure> <session>

4- For non-rigid run 3.1\_NregWarpNeoToHist <SUBJID>