**GM and WM Segmentation with SPM**

(Created by Kayti Keith 9/5/19)

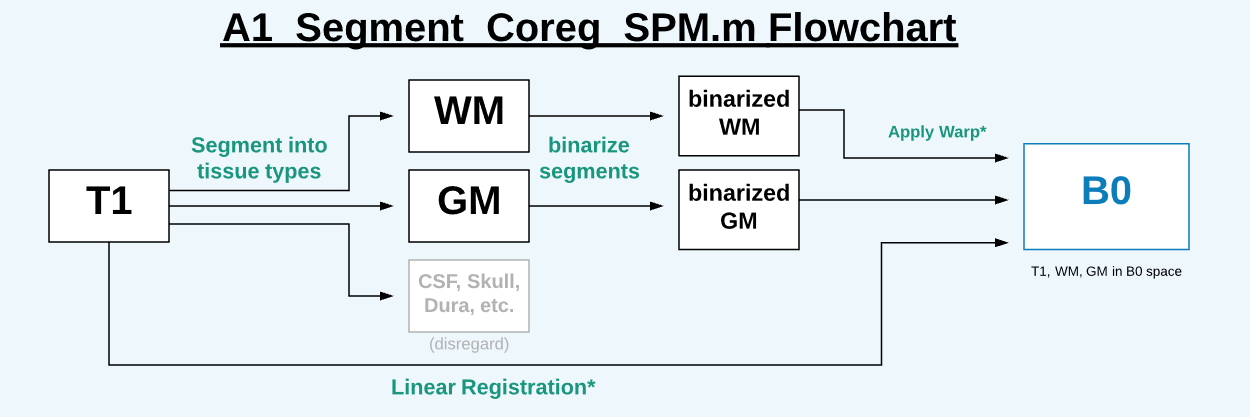
**Processing times based on:** Windows 10, SPM12

**Step 1: A0\_convert\_dcms\_sort\_niis.m**

* Converts T1 and B0 from dicom to nifti and moves the new niftis to the main processing folder.
  + ~2-3sec/subject
* Paths and dicom folder variables will need to be changed
* Outputs: 02\_Cases\01\_Native\_T1T2B0

**Step 2: A1\_Segment\_Coreg\_SPM.m**

* Segments T1 into GM, WM, CSF, skull, dura; binarizes GM and WM segments; coregisters T1 to B0 and applies transformation to GM and WM segments
* Paths will need to be changed
* Binarization threshold = 0.95 (can be changed in %paths and variables section of script)
  + ~7-9min/subject
* In-process segment outputs: 03\_Analysis\01\_Intermediate\_Files
* Finalized segment outputs: 03\_Analysis\01\_Warped\_Segments



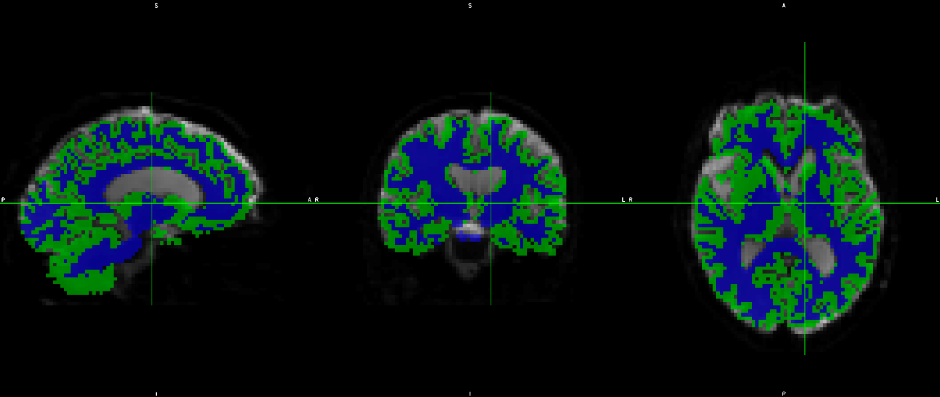
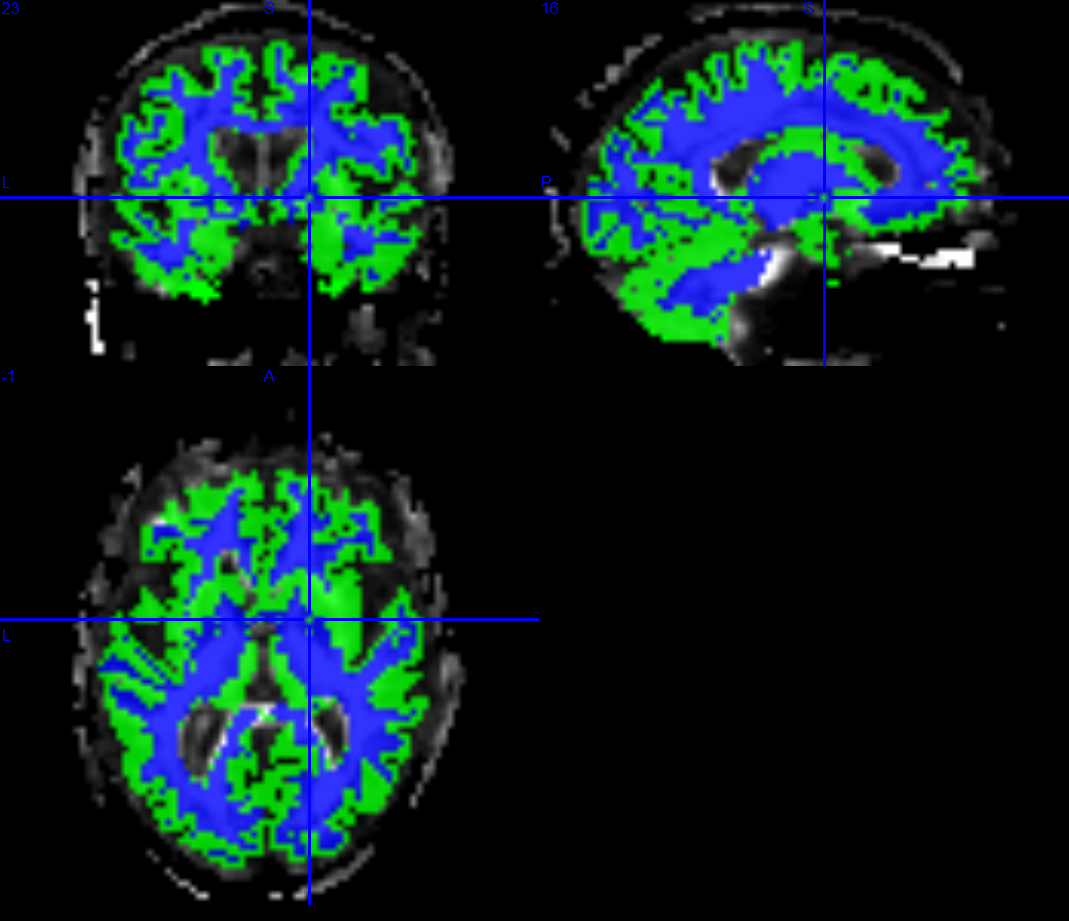
**Step 3: A1a\_DKE\_Met\_Org.sh**

* Copies DKE metrics from main DKE output folder; creates MD mask that will be used later to mask out MD>2
  + ~2-5sec/subjects
* Paths will need to be changed
* Outputs: 02\_DKE\_Maps

**Step 3: QC Segments**

* Open the original B0 in FSLeyes and overlay the full processed GM and WM segments to ensure that the segments were binarized and warped to B0 space correctly.
  + See examples below.

B0: FA:

**Step 4: A2\_process\_histograms.m**

* Masks out MD>2 and outputs bin values across 64 bin locations as *{metric}\_{ROI}\_total\_frequency.txt*
  + ~2-3min/subj
* Outputs: 03\_Analysis\03\_Histograms\_Custom\_ROIs\{ROI}\{metric}

**Step 5: A3\_combine\_total\_frequencies.m**

* Combines *total\_frequency.txt* tables output by previous step as *All\_Bin\_Frequencies.txt*
  + 2-4min
* Outputs: 03\_Analysis\03\_Histograms\_Custom\_ROIs