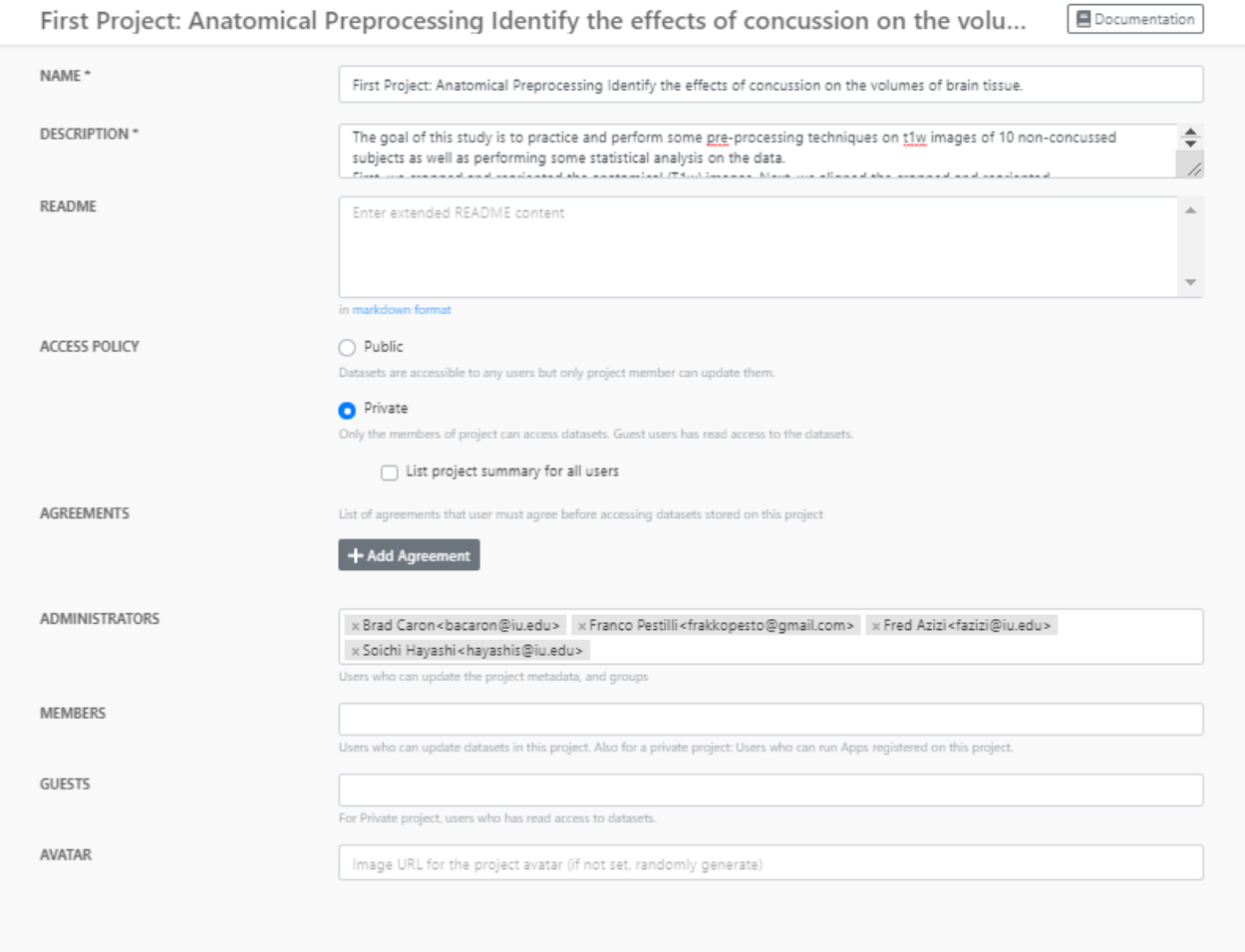
Report 1: Anatomical Preprocessing- Identify the effects of concussion on the volumes of brain tissue.

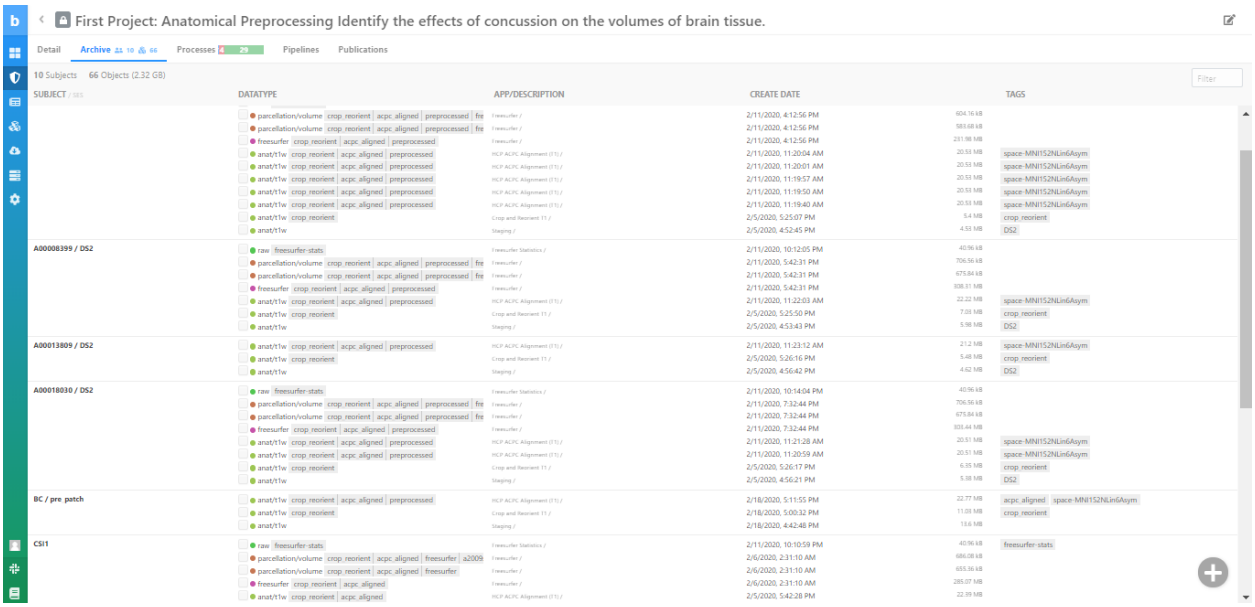
Fred Azizi

2/21/2020

1. **Create a project to perform your preprocessing**

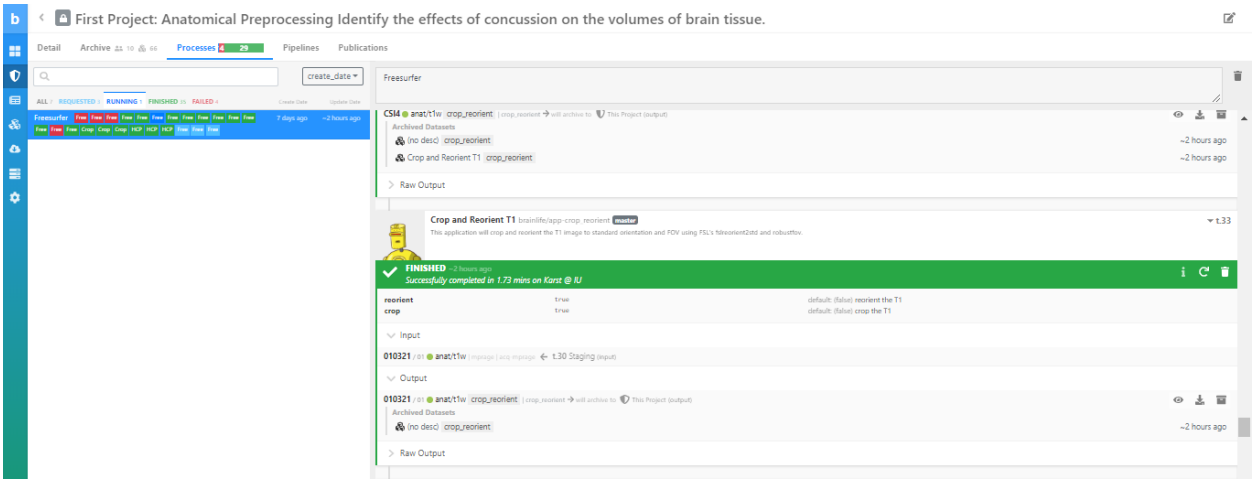


2. **Copying data from at least three open projects**



3. **Crop and Reorient the anatomical data**

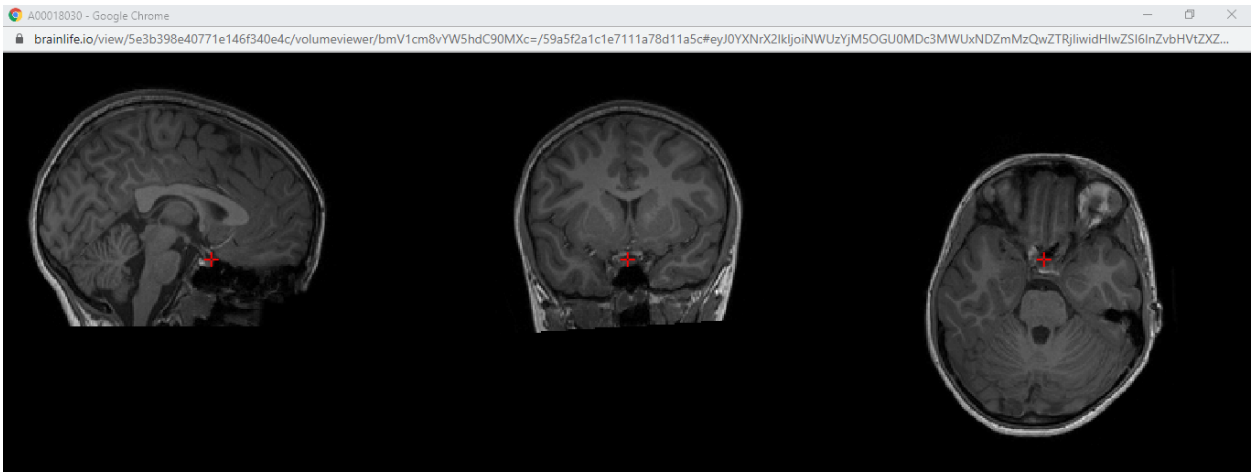
a. Staging Subjects



b. View the results

Subject 1:

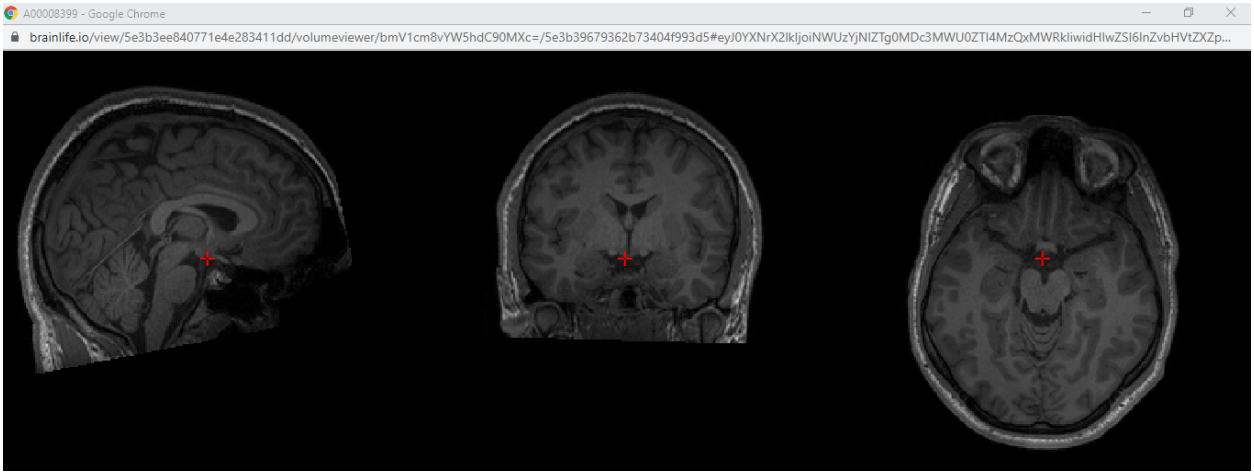
Pre Cropped/Reoriented:



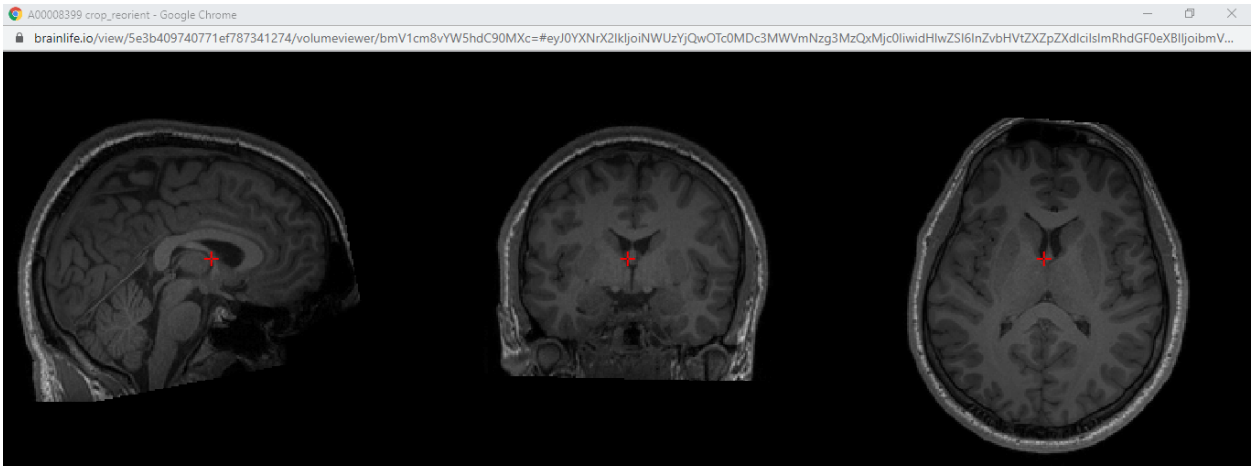
Post Cropped/Reoriented:

Subject 2

Pre Cropped/Reoriented:

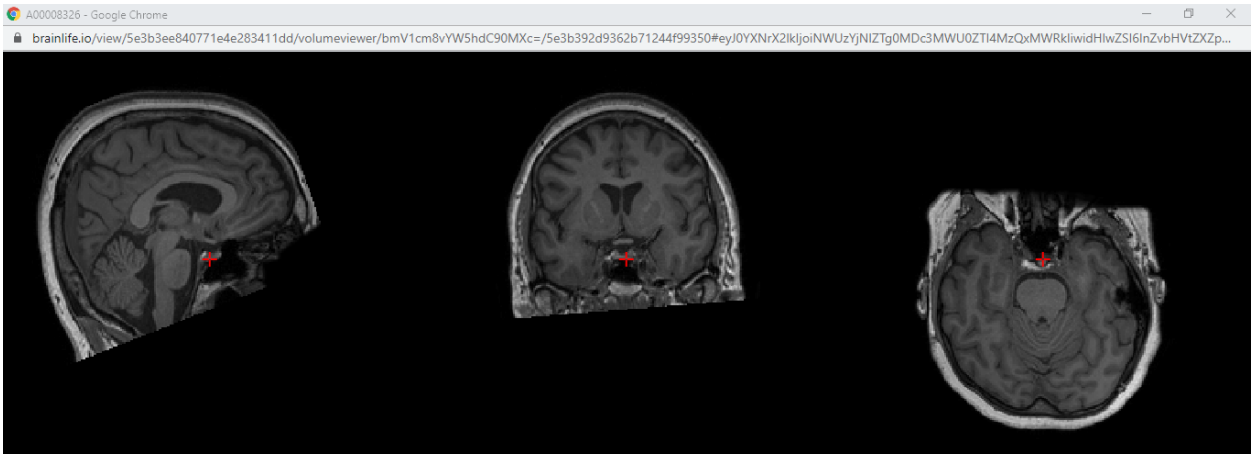


Post Cropped/Reoriented:

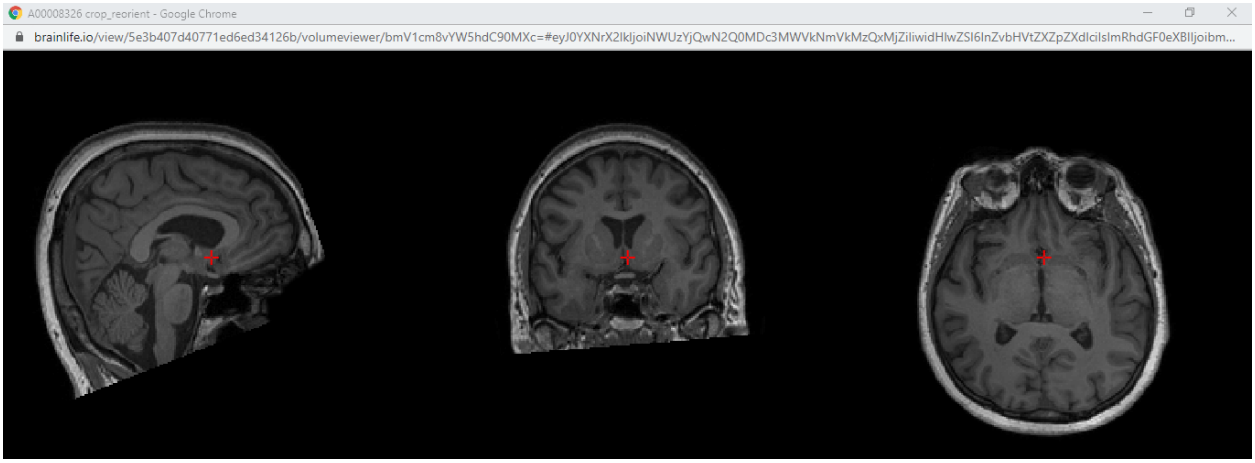


Subject 3

Pre Cropped/Reoriented:

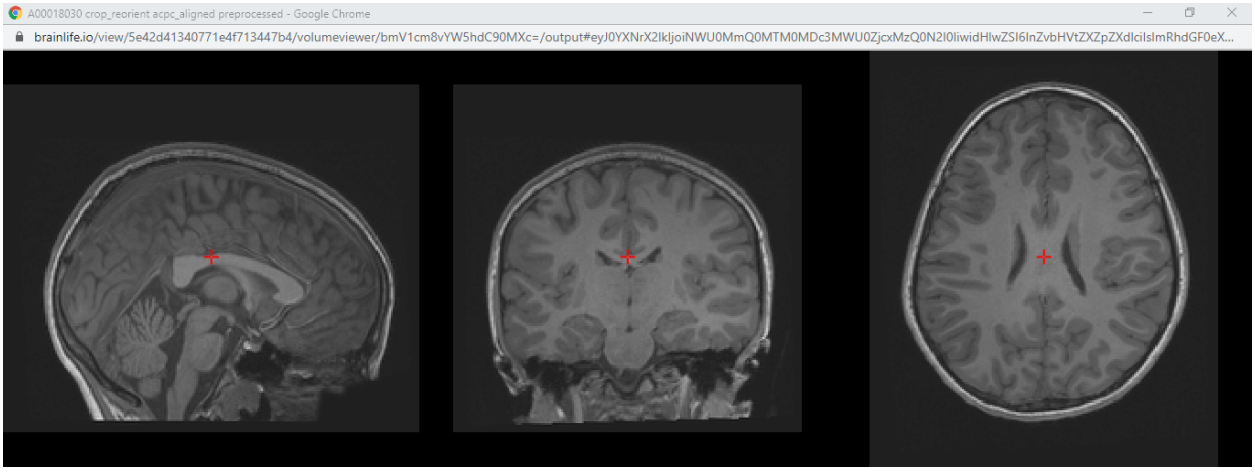


Post Cropped/Reoriented:

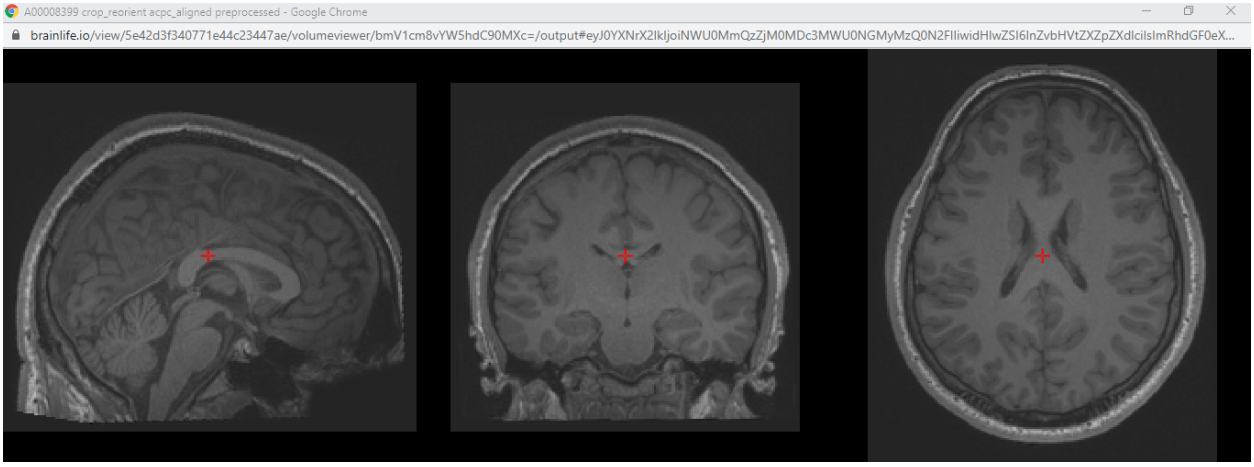


4. ACPC Alignment

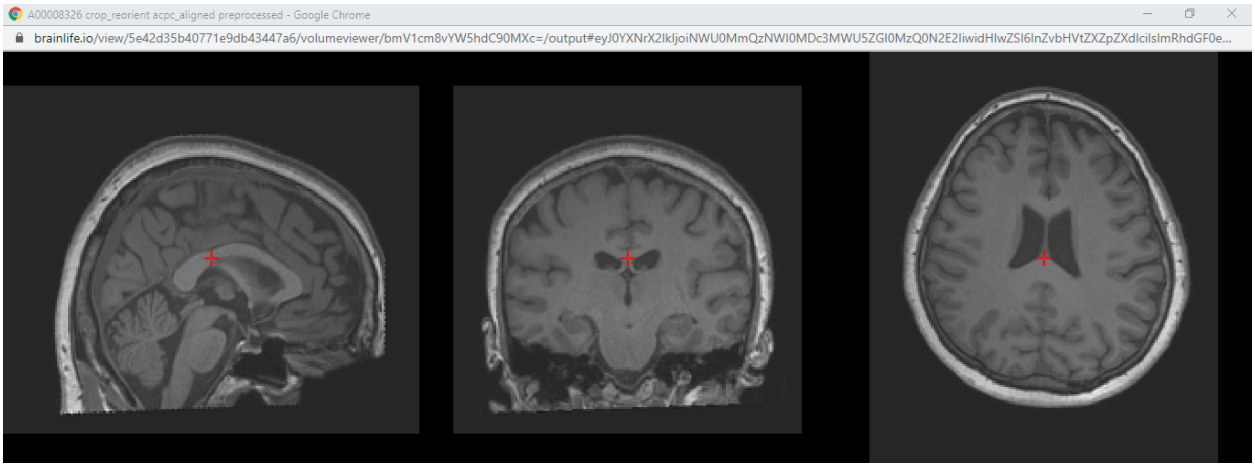
Subject 1:



Subject 2:



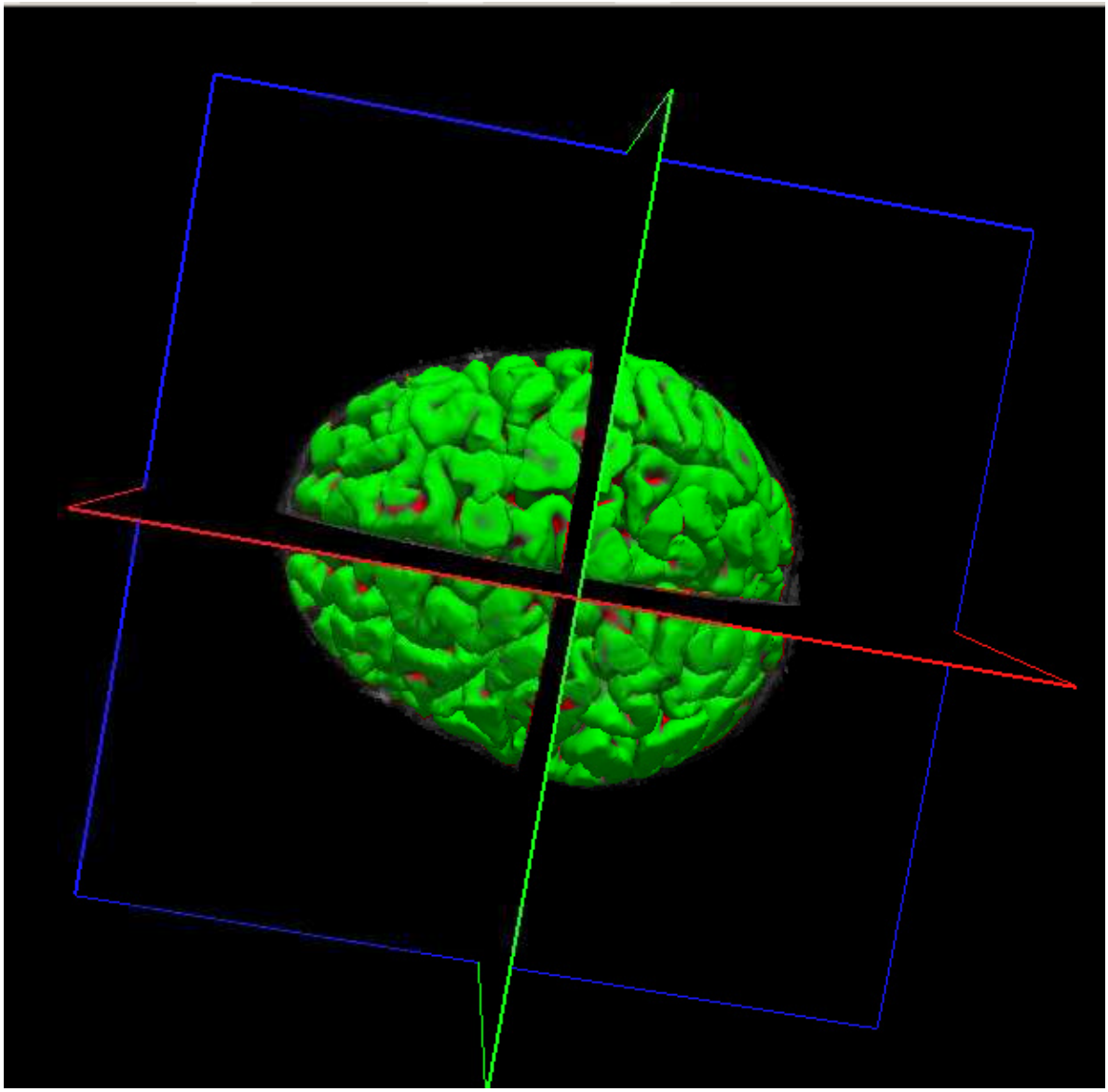
Subject 3:



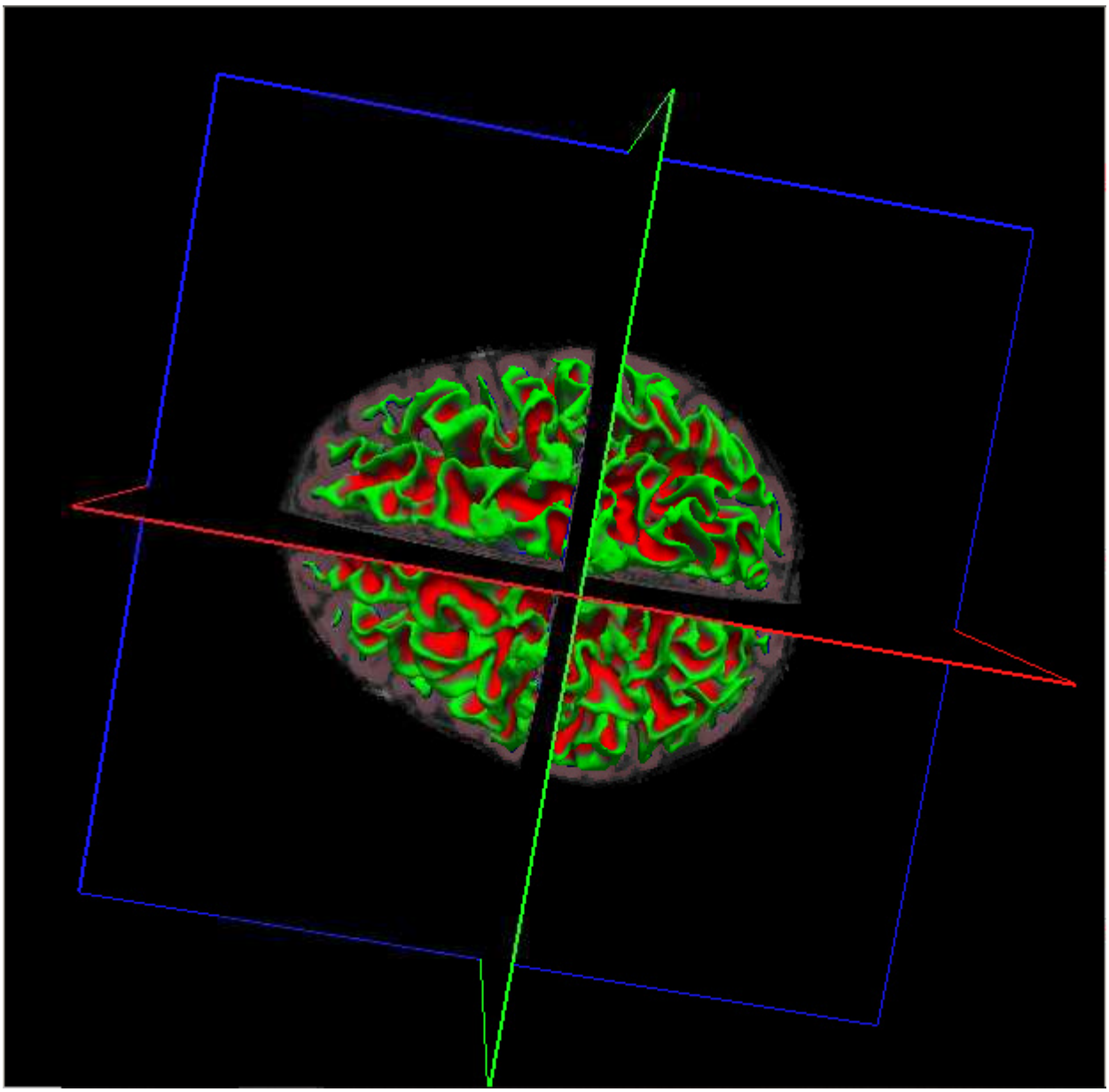
5. **Freesurfer Parcellation**

Subject 1:

L/R cortical surface:



L/R white matter surface:



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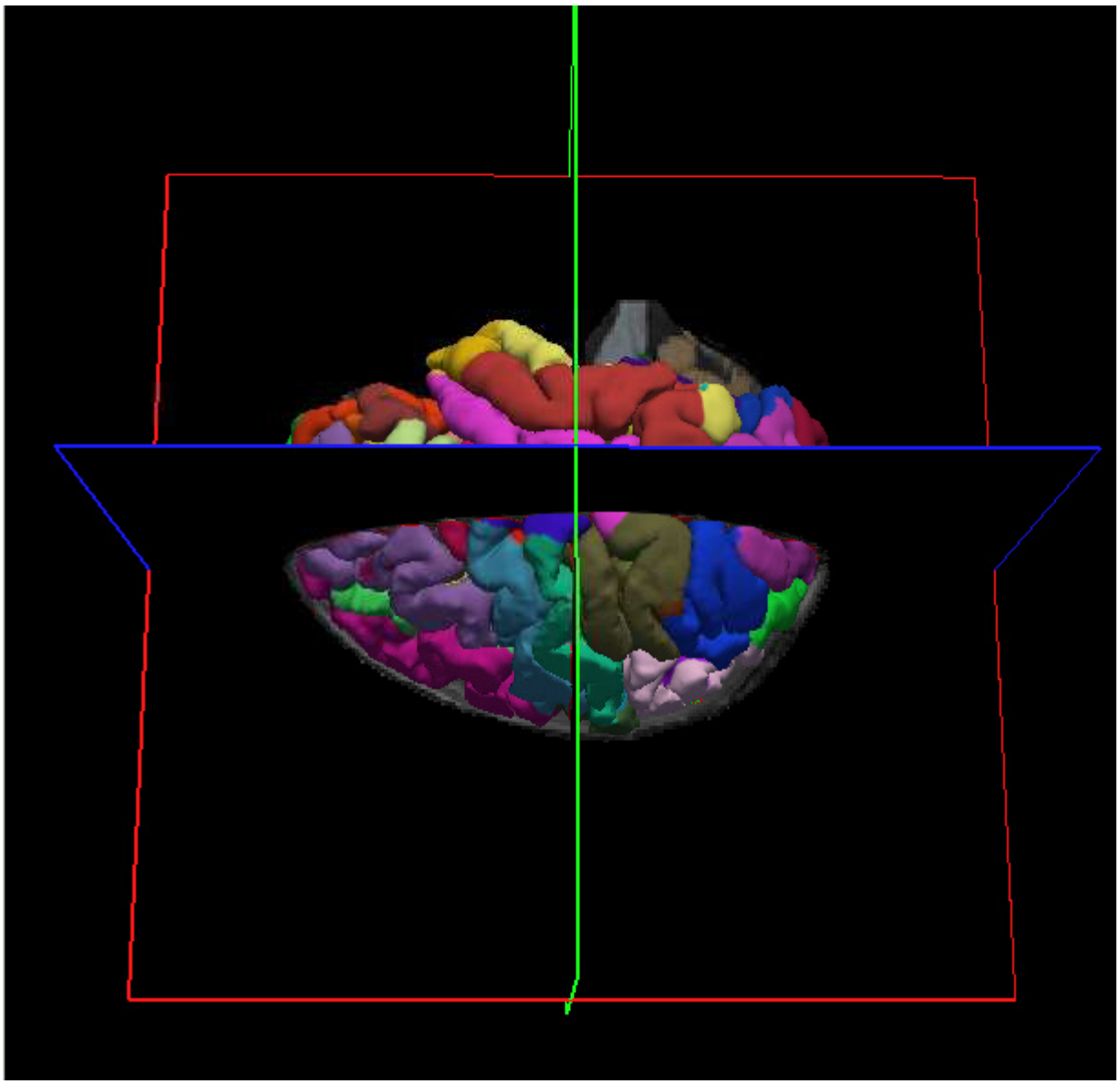
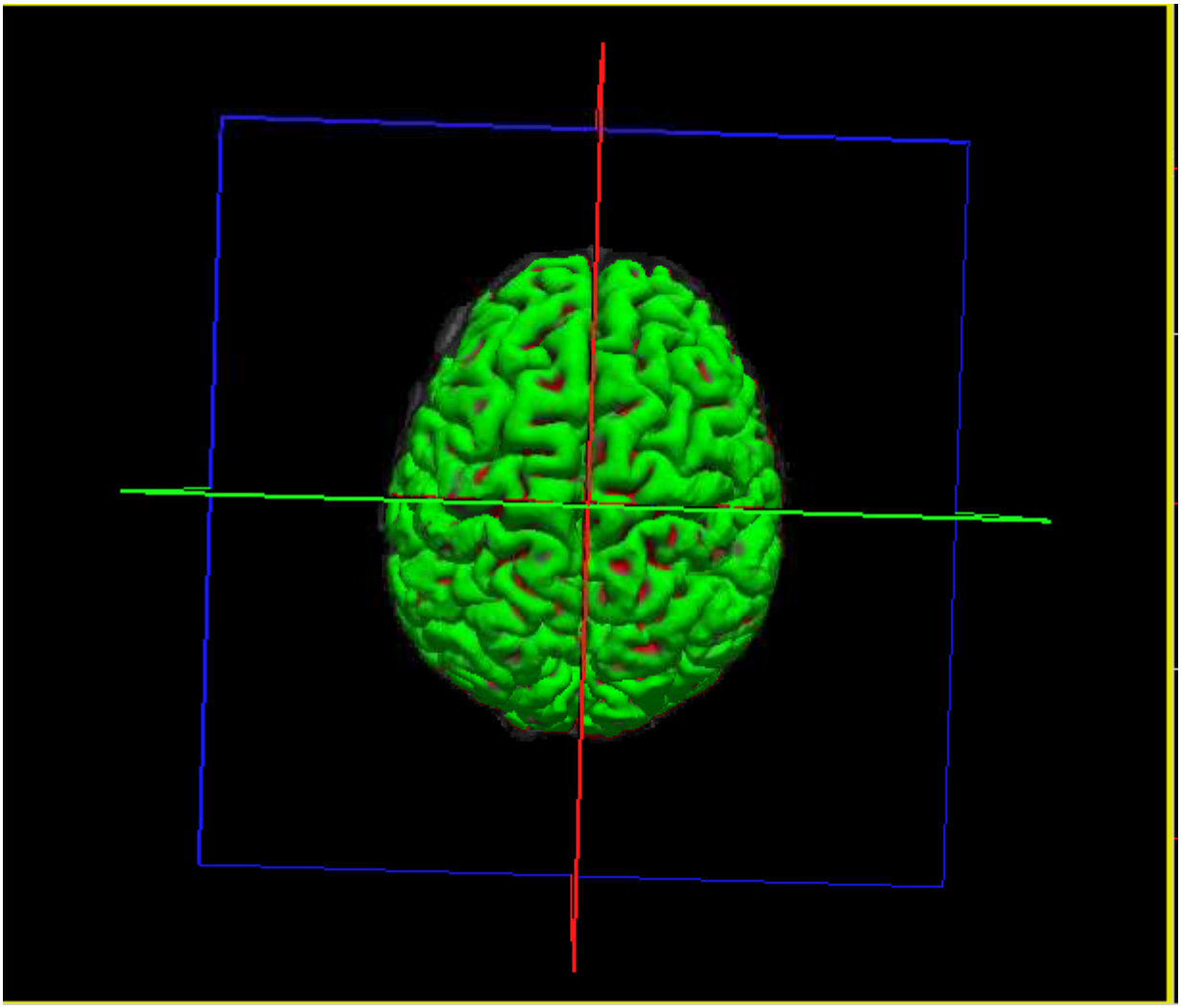
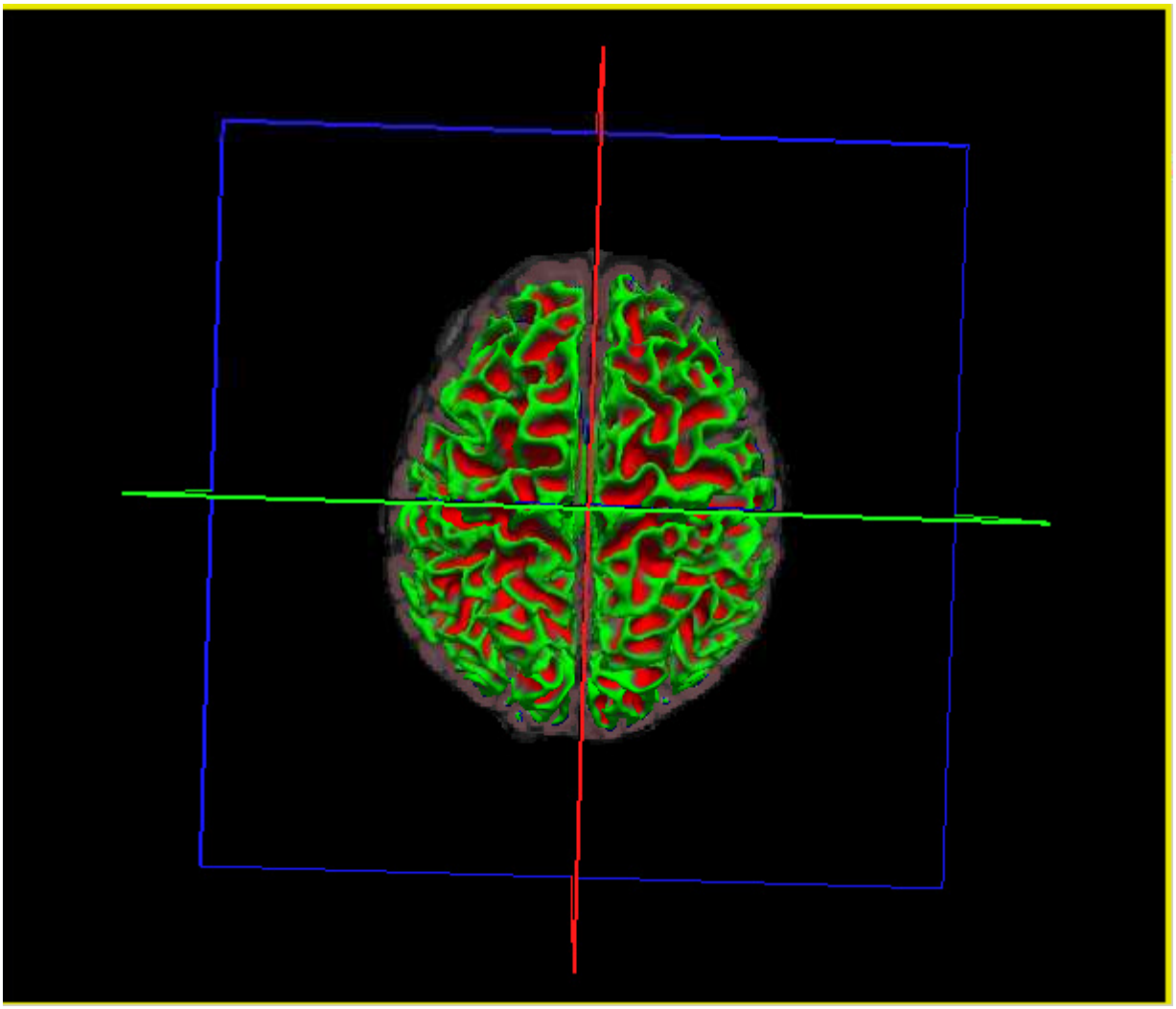


Subject 2:

L/R cortical surface:



L/R white matter surface:



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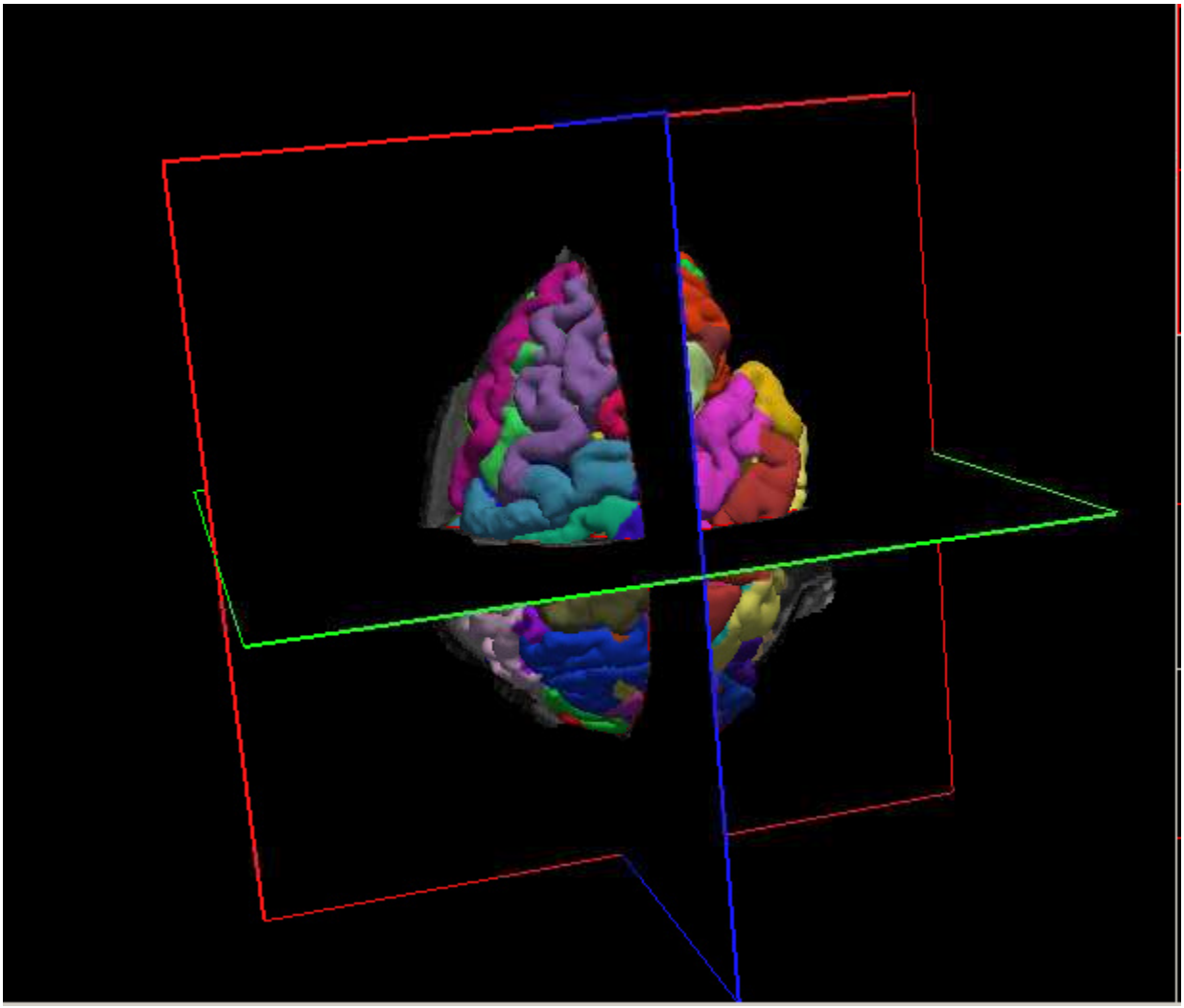
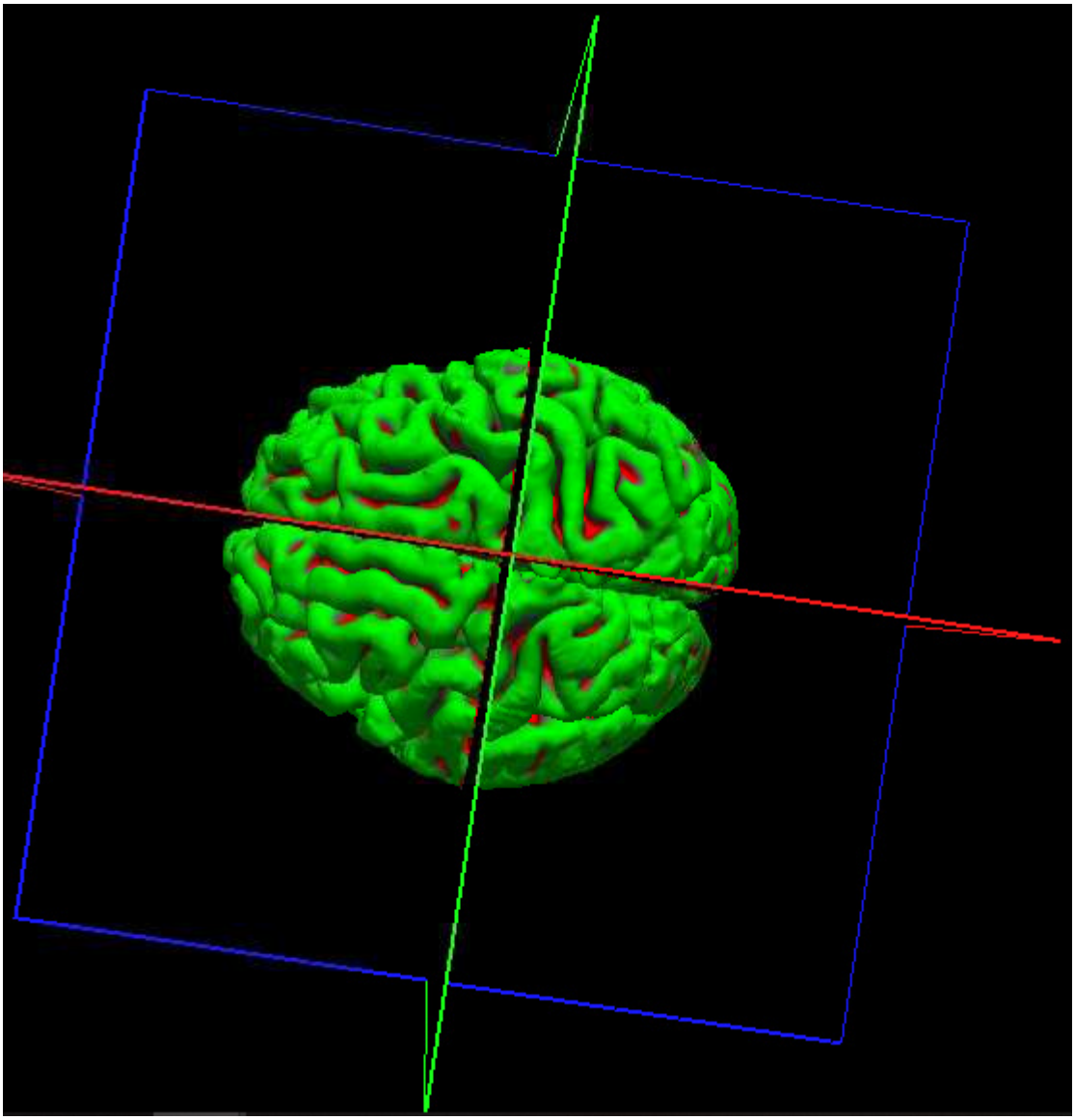
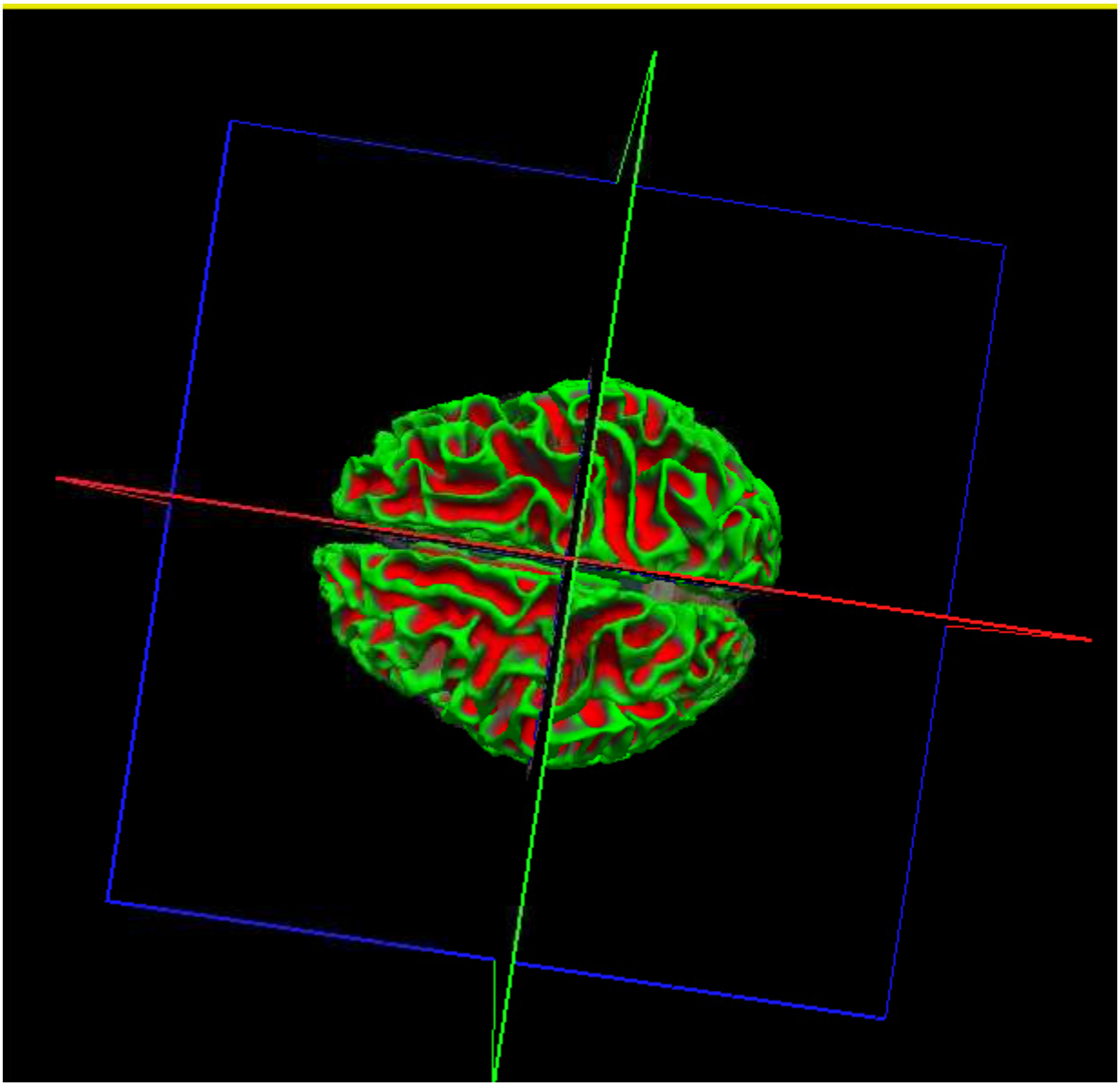


Subject 3:

L/R cortical surface:



L/R white matter surface:



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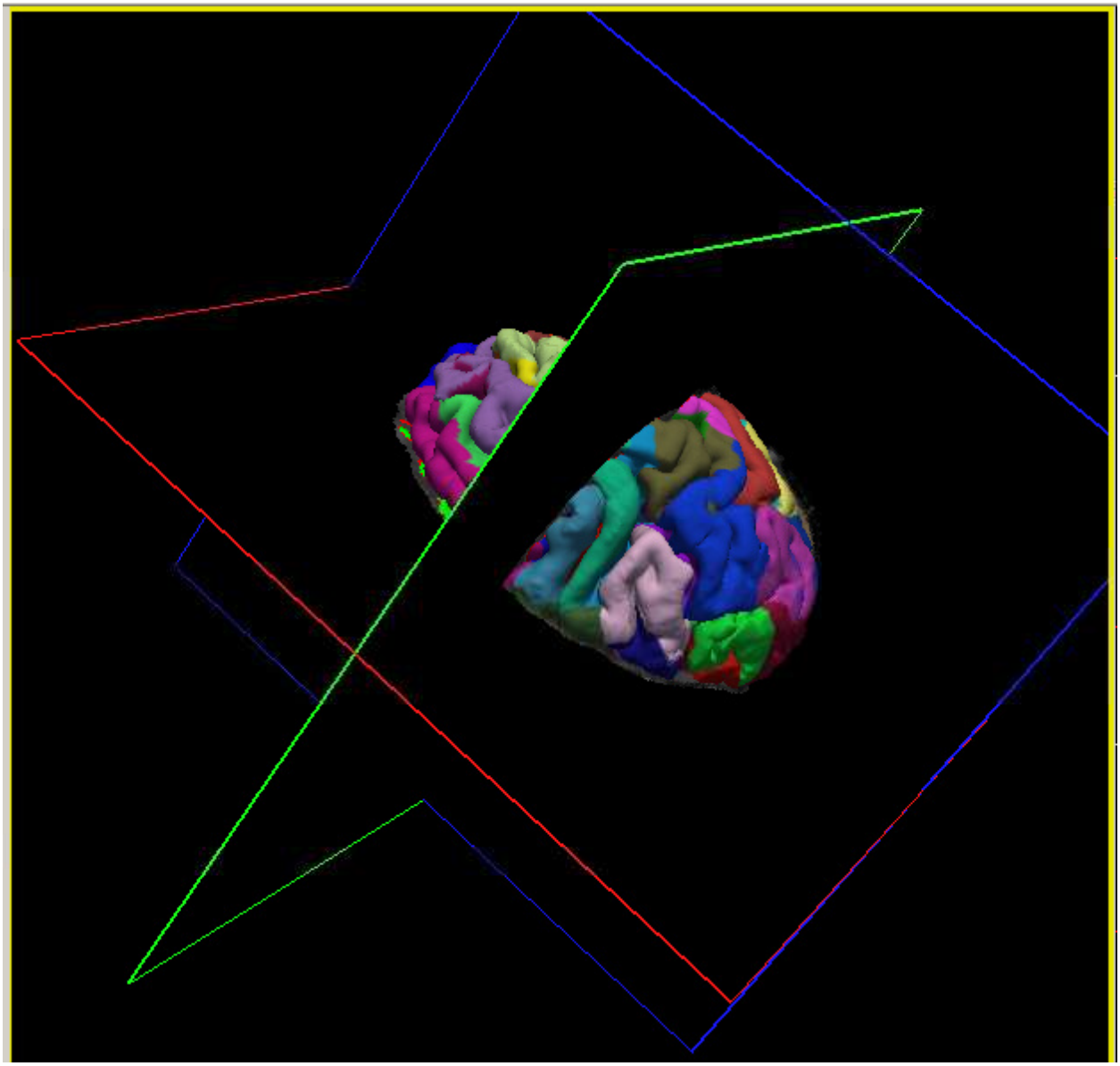


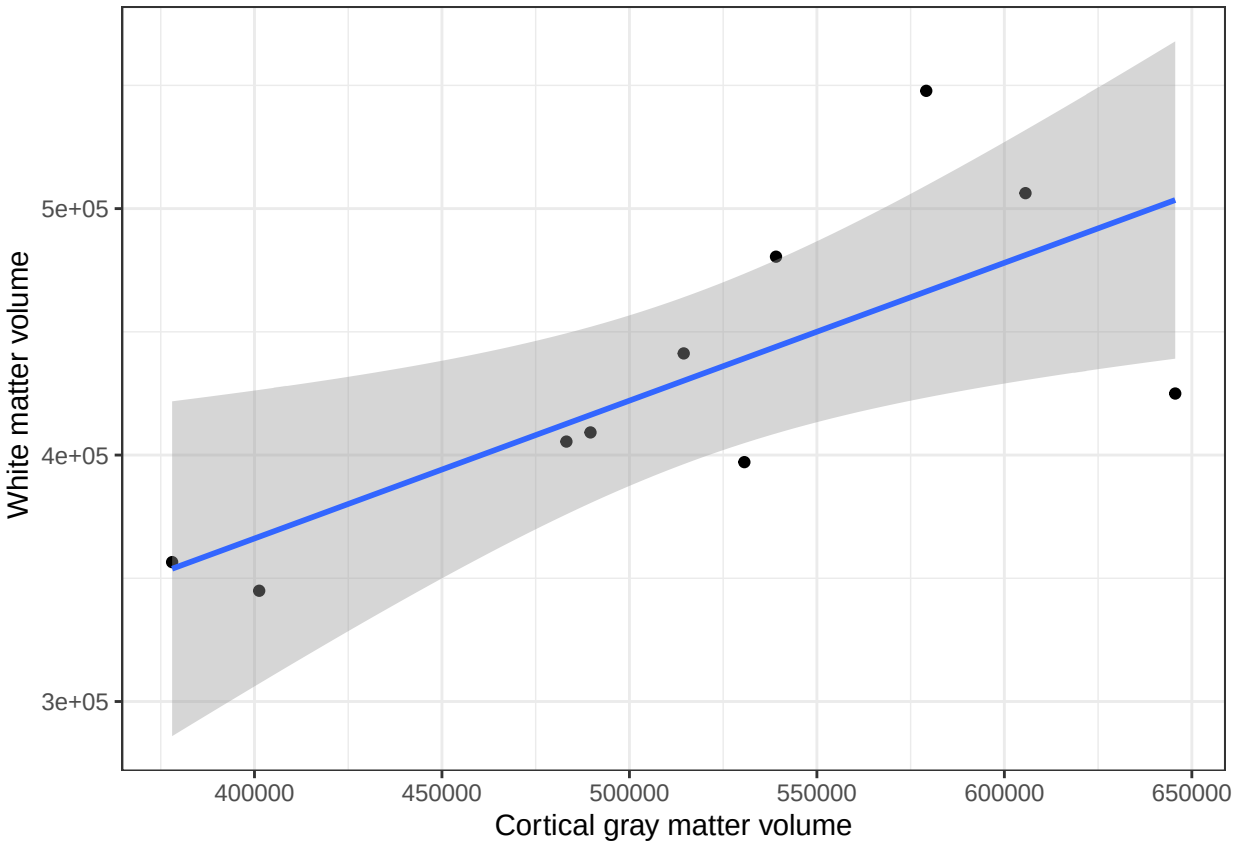
6. Freesurfer Statistics

a. The average (and standard deviation) volume of all the cortical structures across our healthy, non-concussed subjects (for the whole brain).

mean	sd
516670.6	84017.23

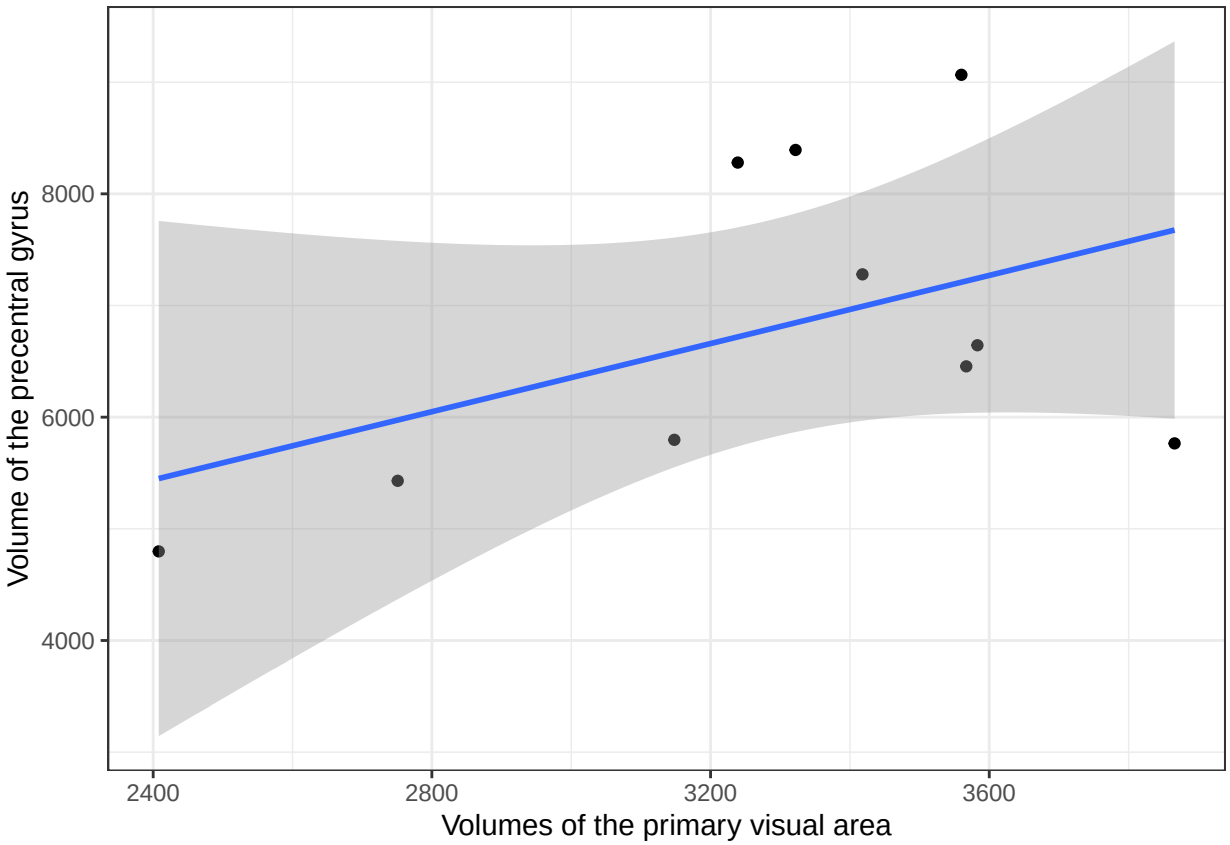
b. The correlation coefficient between the total gray- and white-matter volumes and a scatterplot to show the relationship.

correlation
0.7316412



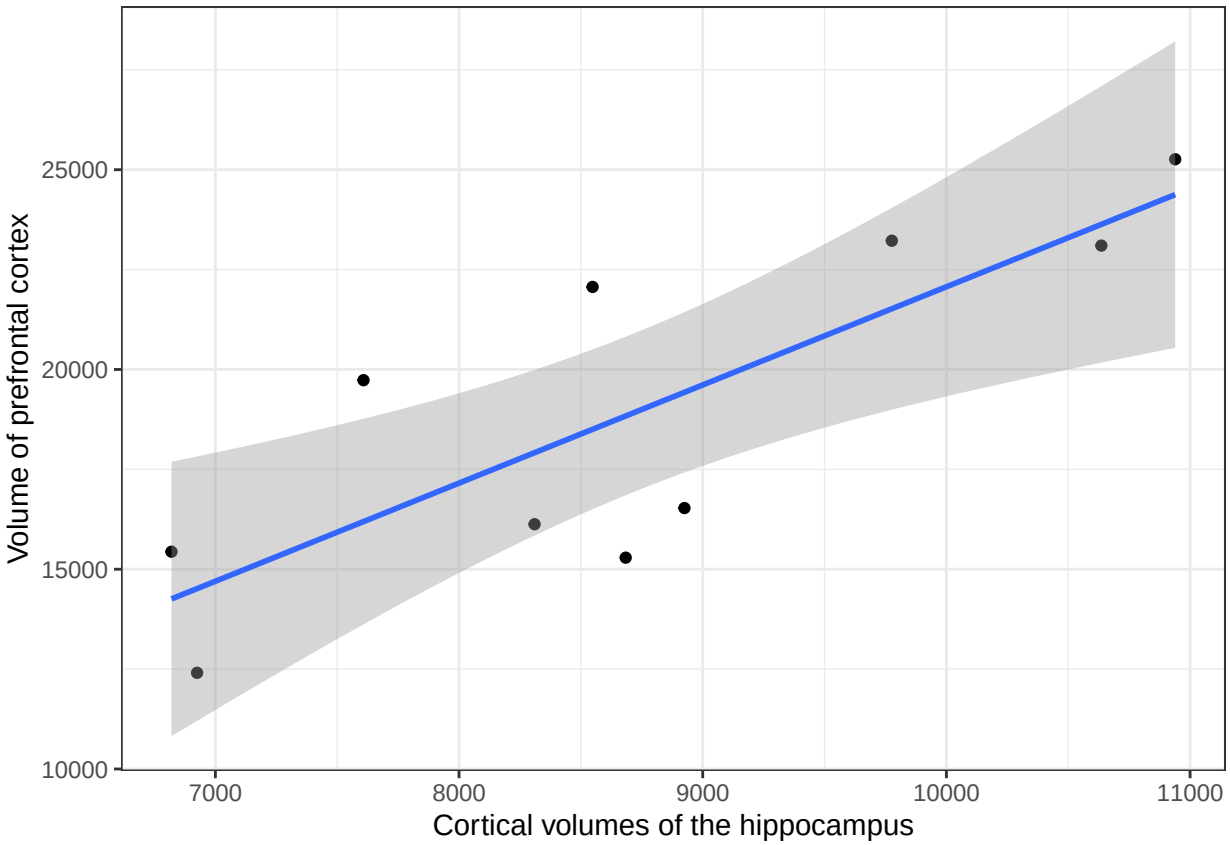
c. The correlation coefficient between the cortical (gray matter) volumes of the primary visual area and the precentral gyrus (for left hemisphere).

correlation
0.4631364



d. The correlation coefficient between the cortical volumes of the hippocampus and the prefrontal cortex (for left hemisphere).

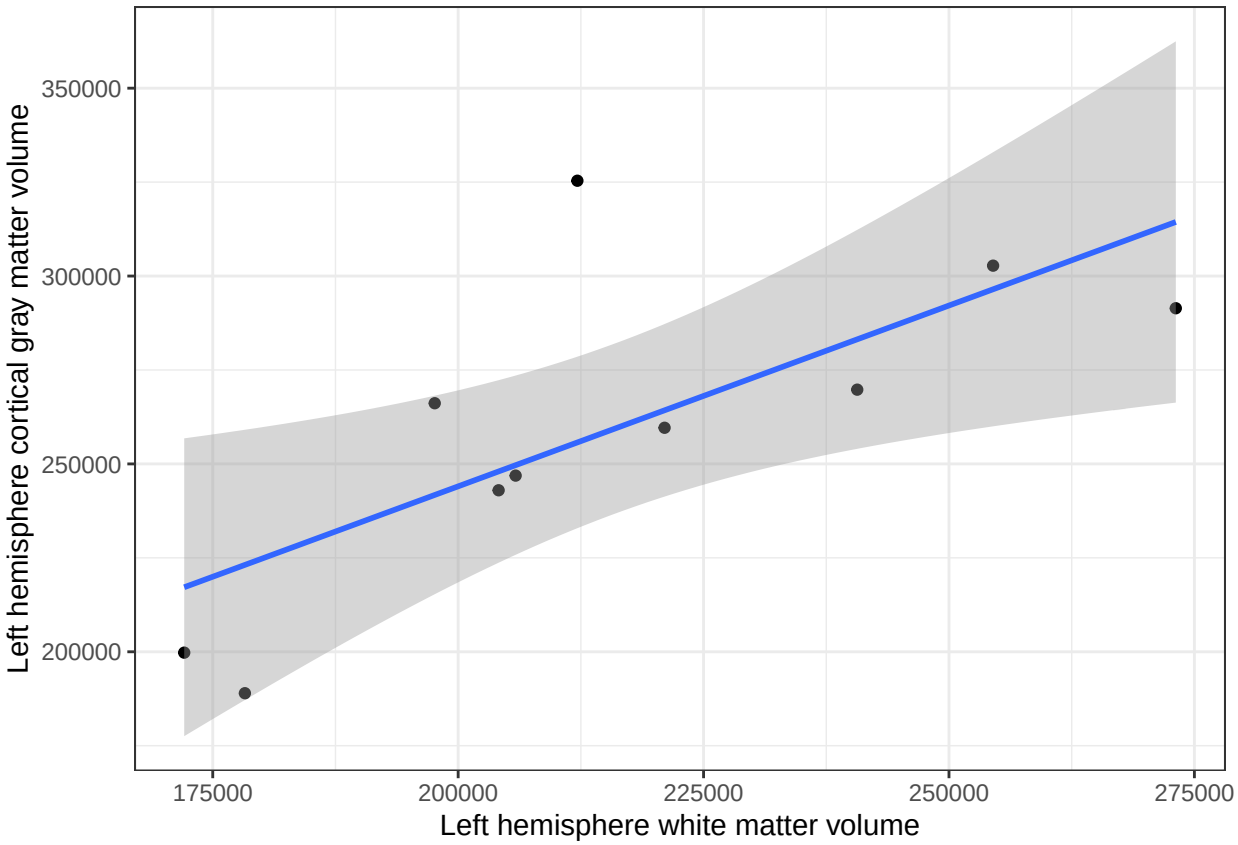
correlation
0.804688



e. The correlation coefficient between white matter volume and gray matter volume separately for both the left hemisphere and right hemisphere. You should have two correlations and plots, one for each hemisphere.

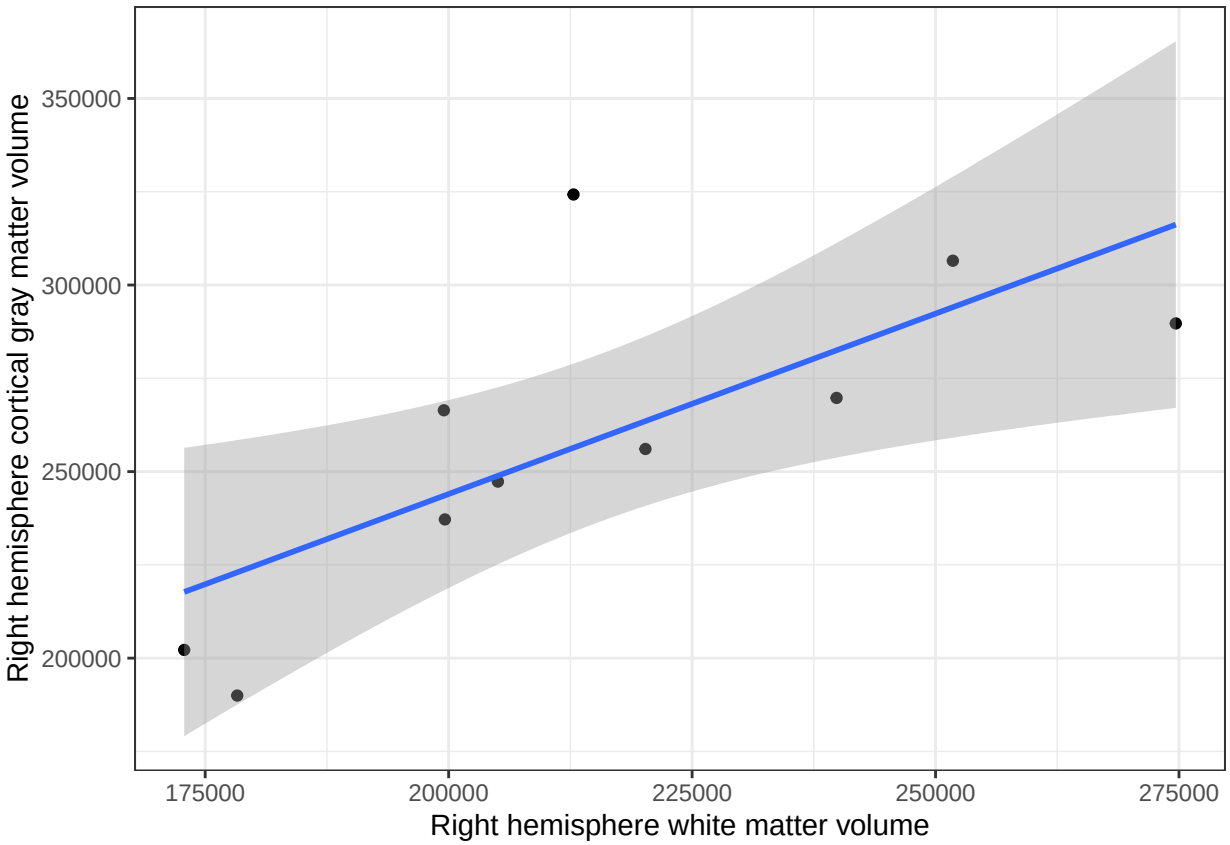
For left hemisphere:

correlation
0.726701



For the right hemisphere:

correlation
0.7301152


Right hemisphere cortical gray matter volume
350000
300000
250000
200000
175000
200000
225000
250000
275000
Right hemisphere white matter volume