

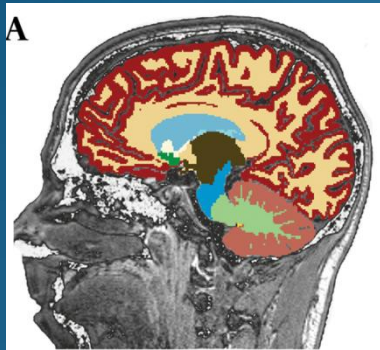
Connectomic visualization using the LONI Pipeline

Andrei Irimia, Ph.D.

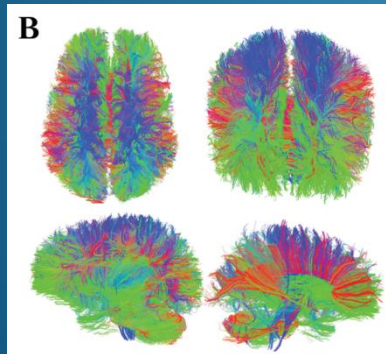
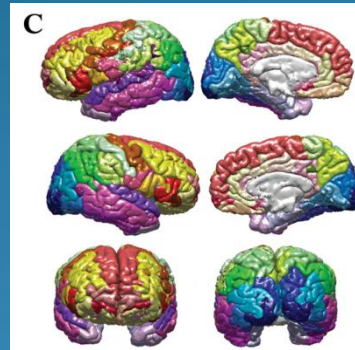
Laboratory of Neuro Imaging
University of California, Los Angeles

Connectomics via the LONI Pipeline

automatic
segmentation

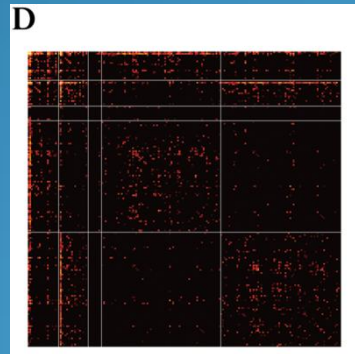


automatic
parcellation



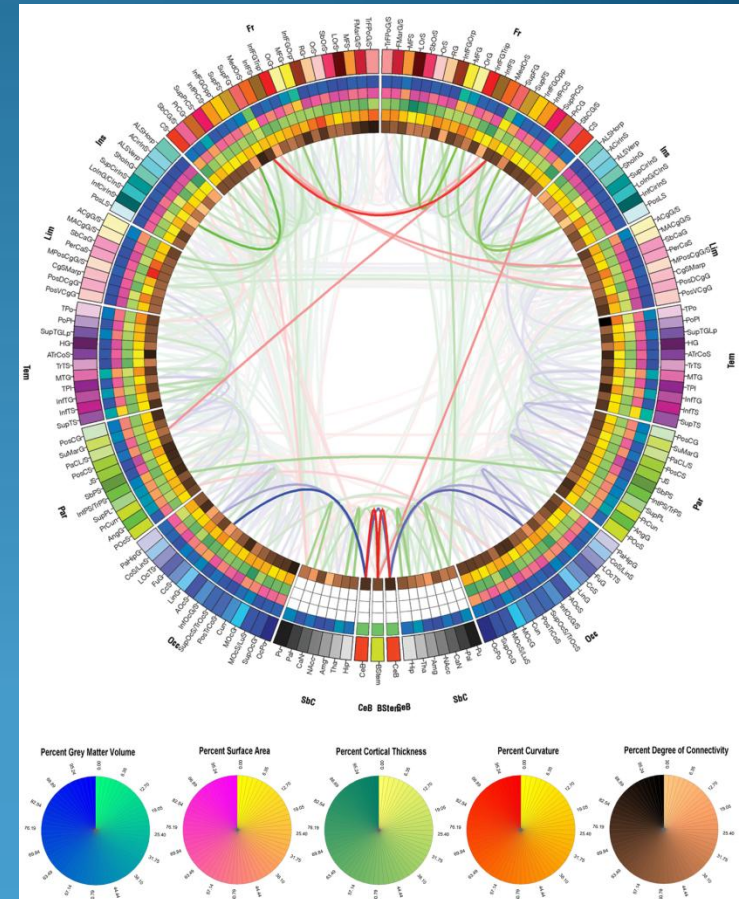
DTI

tractography

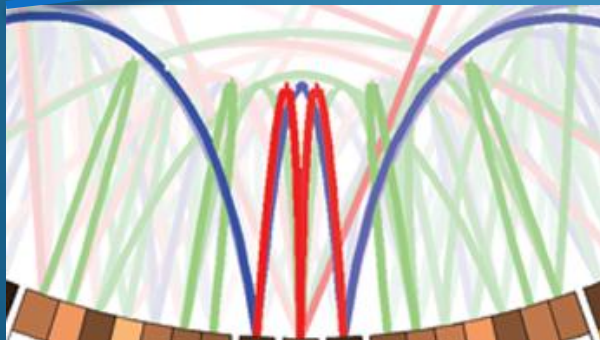
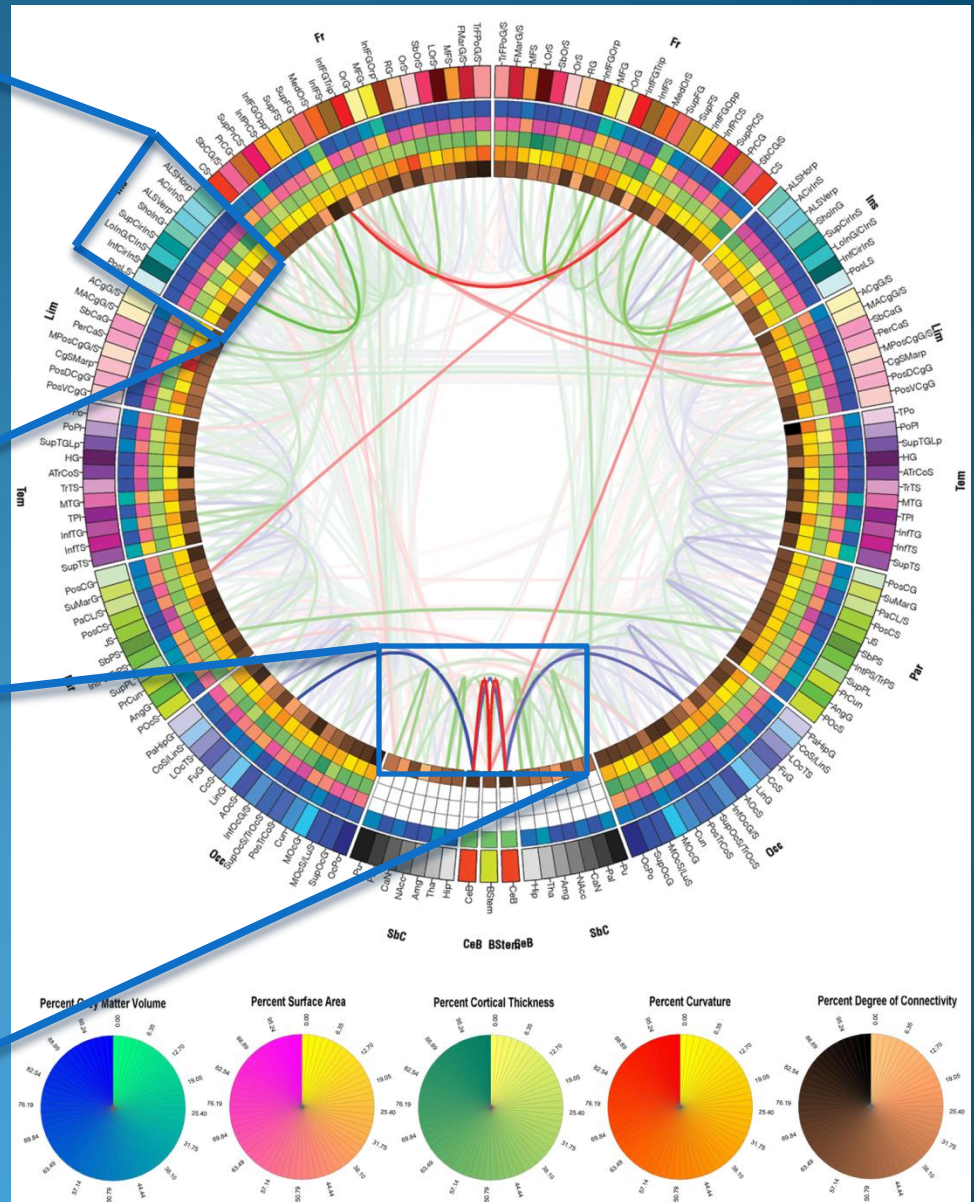
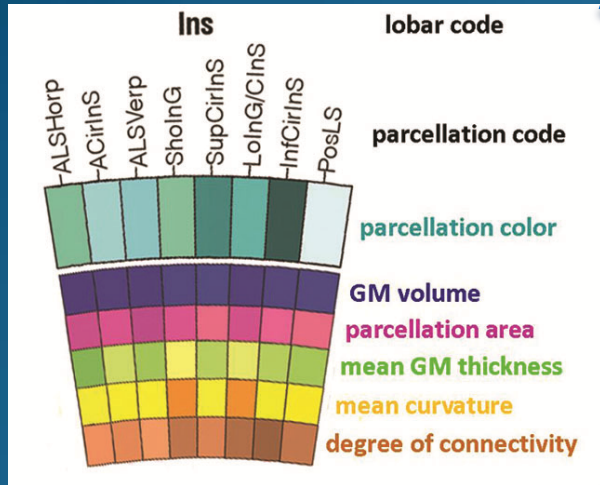


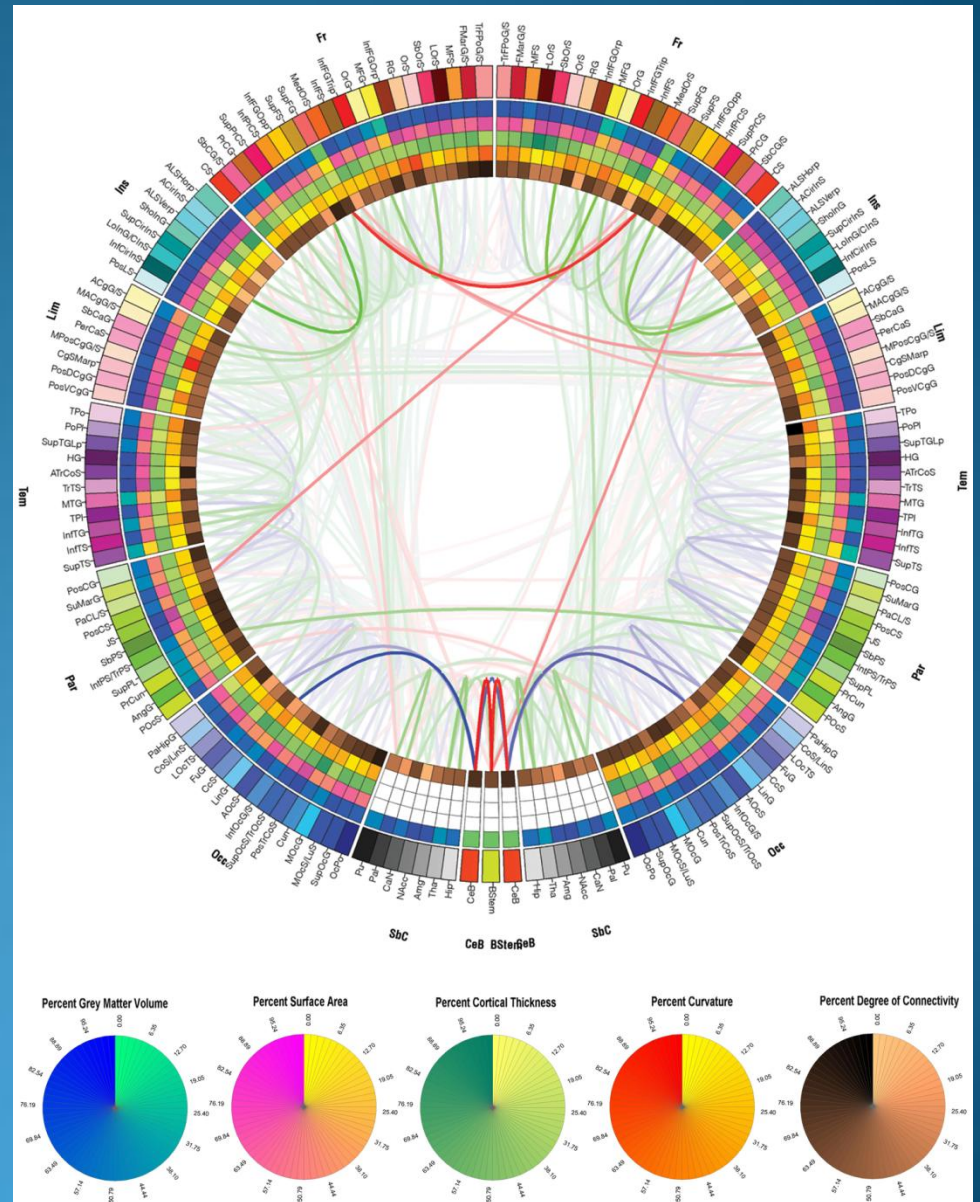
connectivity
matrix calculation

connectogram

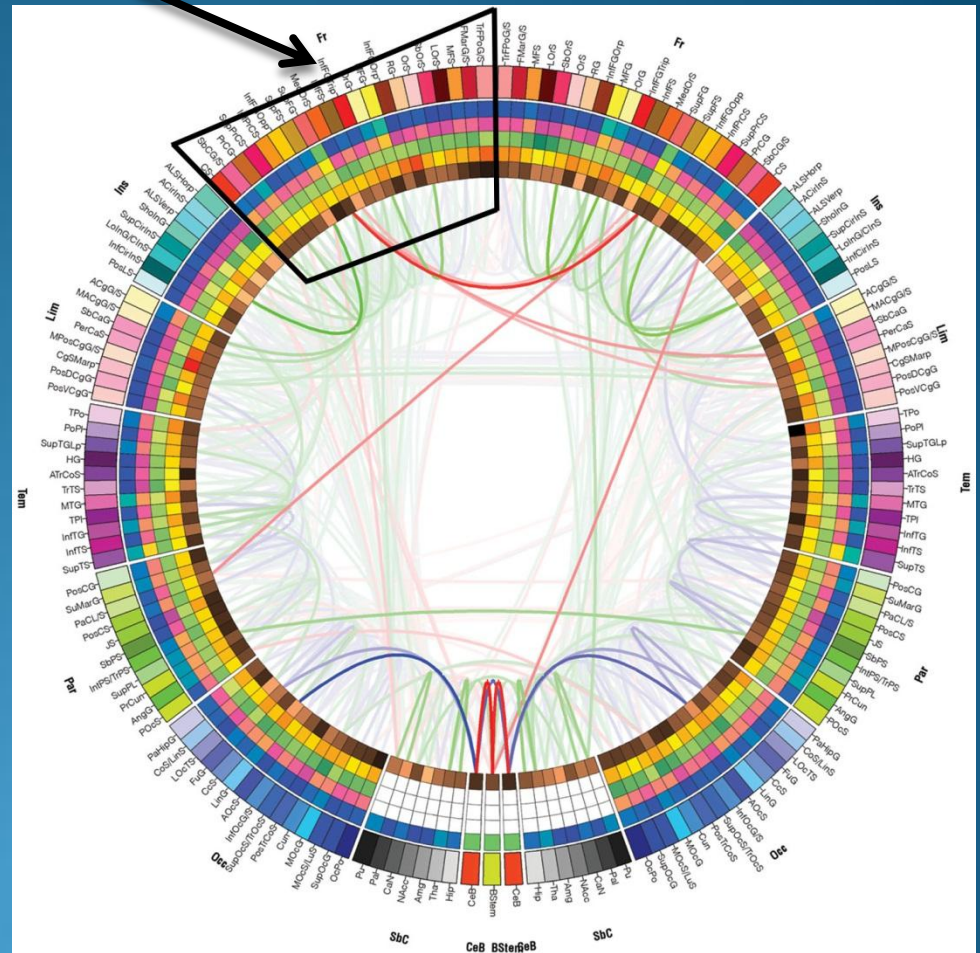


Connectogram interpretation

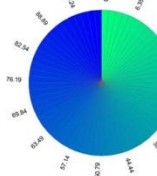




FRONTAL



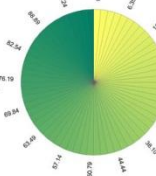
Percent Grey Matter Volume



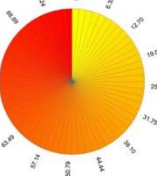
Percent Surface Area



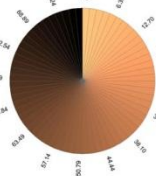
Percent Cortical Thickness



Percent Curvature



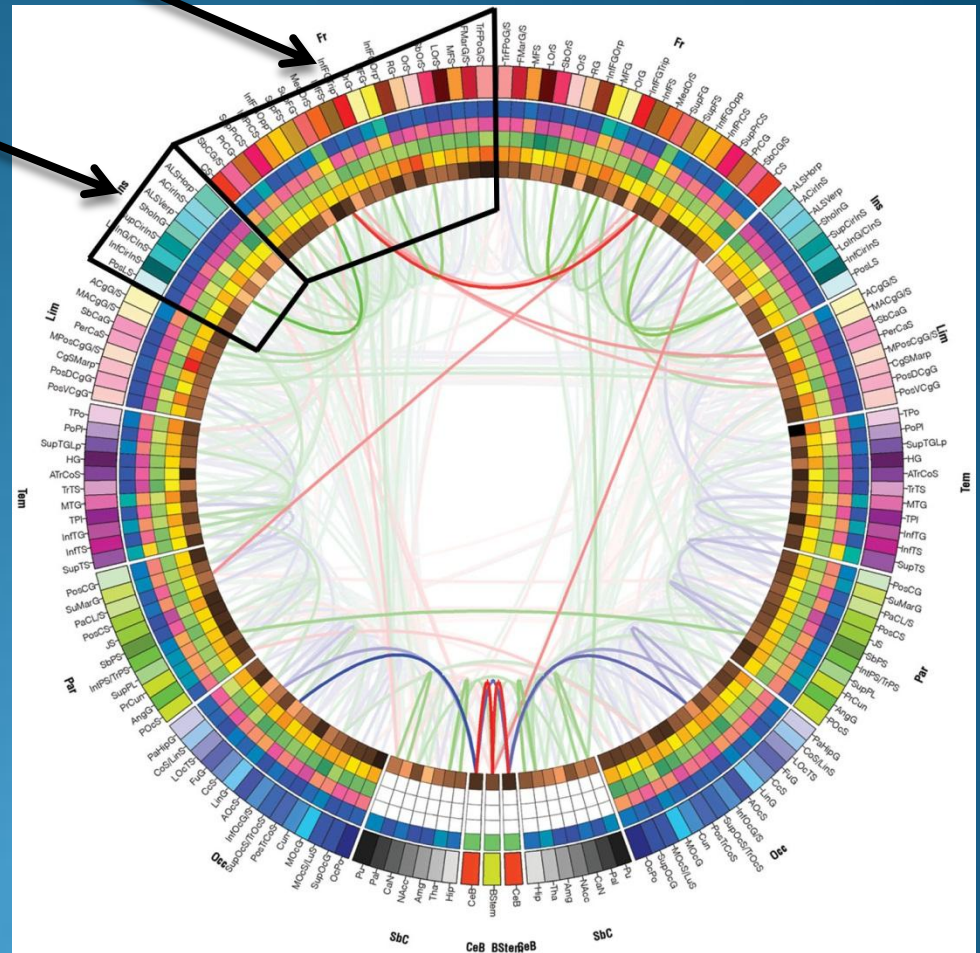
Percent Degree of Connectivity



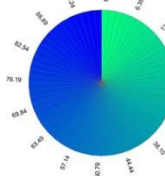
INSULAR



FRONTAL



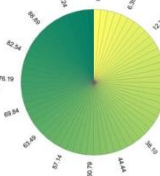
Percent Grey Matter Volume



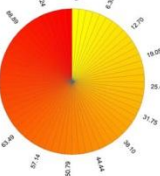
Percent Surface Area



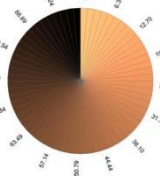
Percent Cortical Thickness



Percent Curvature



Percent Degree of Connectivity

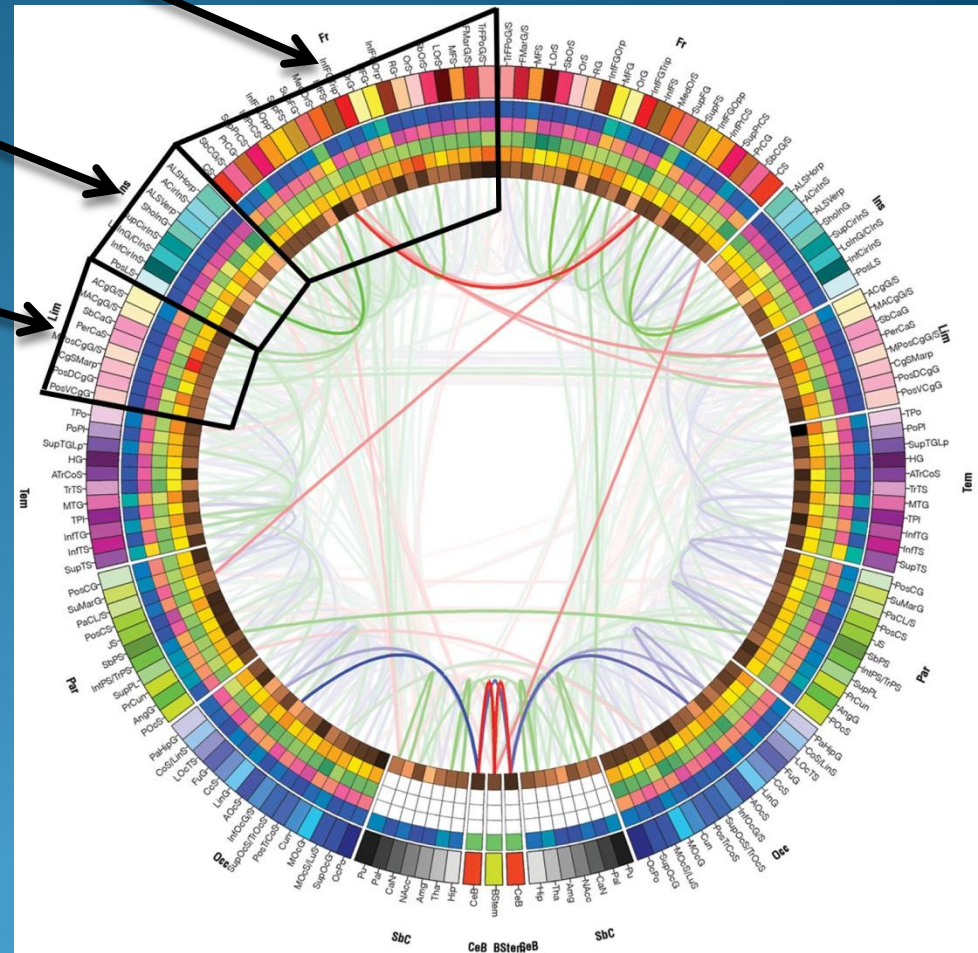


FRONTAL

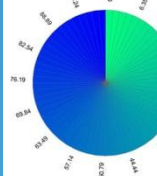
INSULAR



LIMBIC



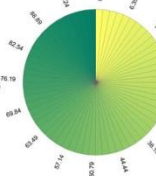
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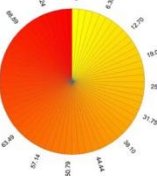
Percent Surface Area



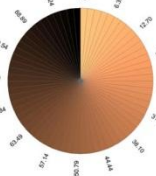
Percent Cortical Thickness



Percent Curvature



Percent Degree of Connectivity



FRONTAL

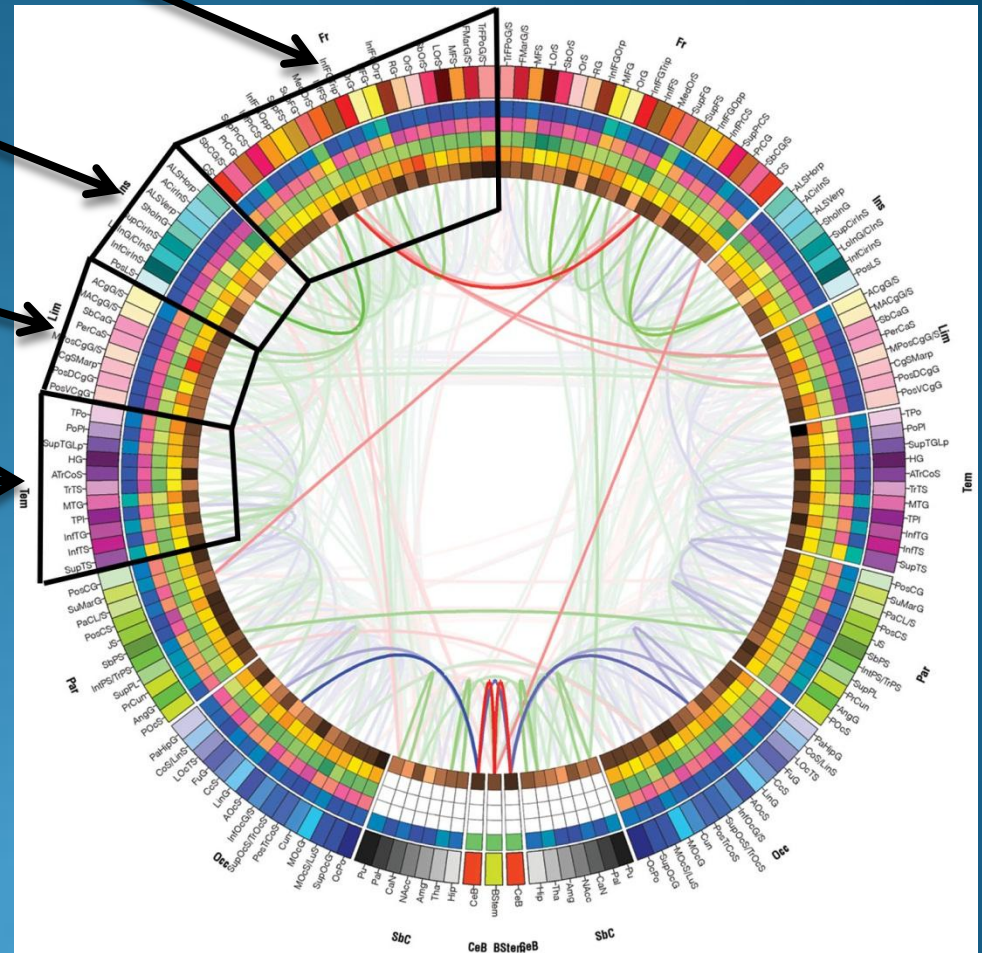
INSULAR



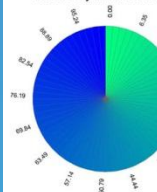
LIMBIC



TEMPORAL



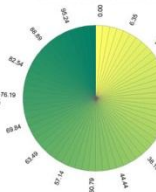
Percent Grey Matter Volume



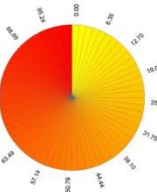
Percent Surface Area



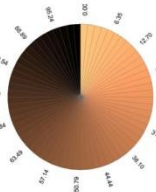
Percent Cortical Thickness



Percent Curvature



Percent Degree of Connectivity



FRONTAL

INSULAR



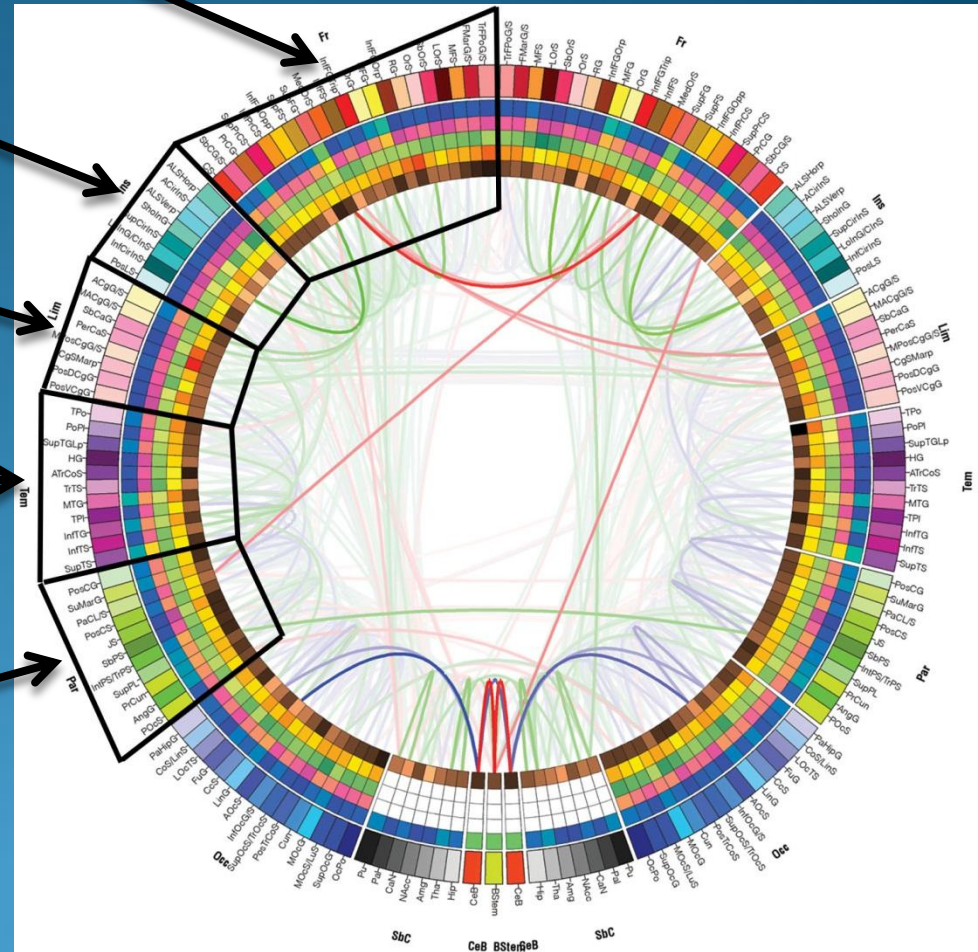
LIMBIC



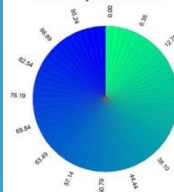
TEMPORAL



PARIETAL



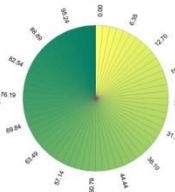
Percent Grey Matter Volume



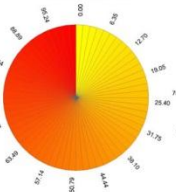
Percent Surface Area



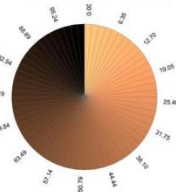
Percent Cortical Thickness



Percent Curvature



Percent Degree of Connectivity



FRONTAL

INSULAR



LIMBIC



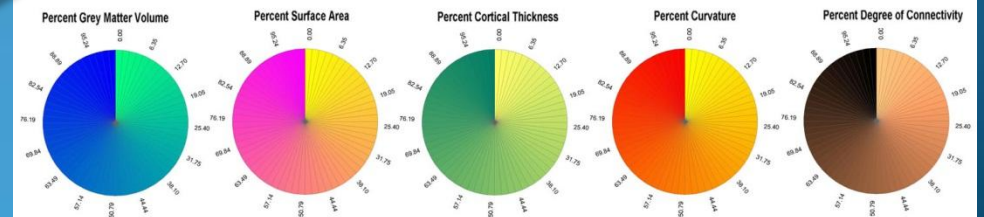
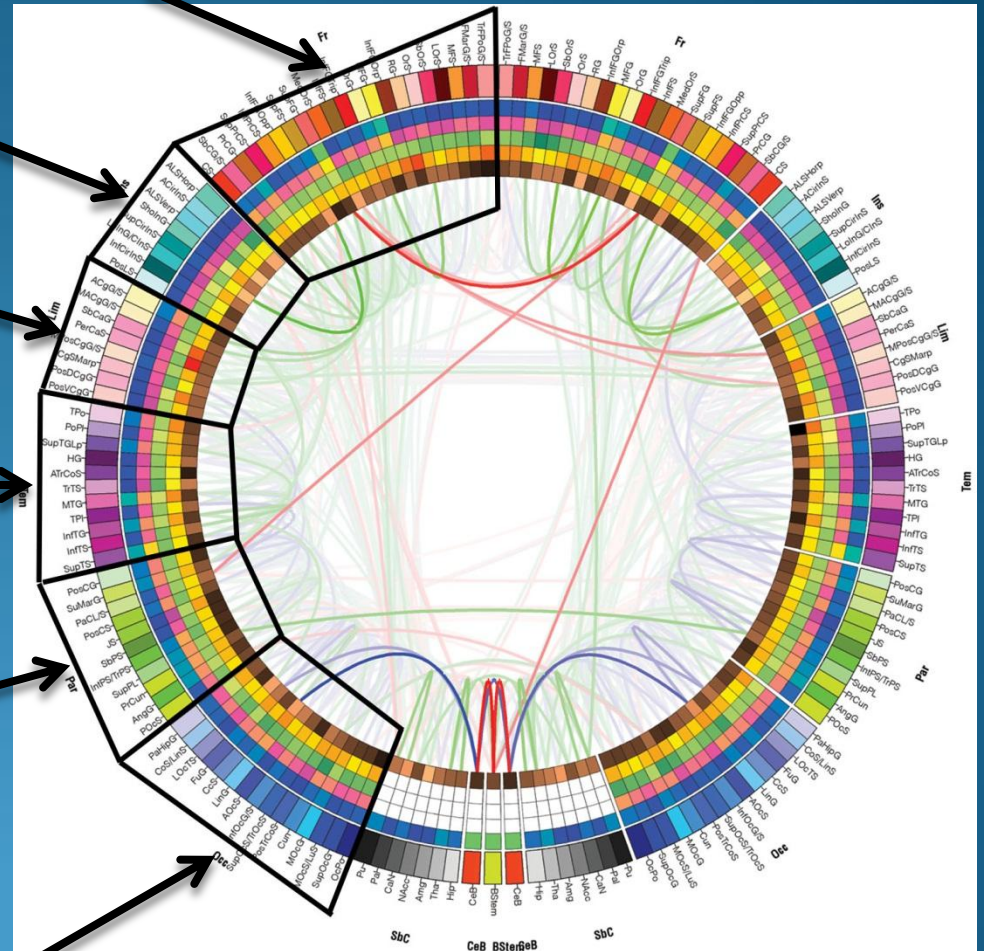
TEMPORAL



PARIETAL



OCCIPITAL

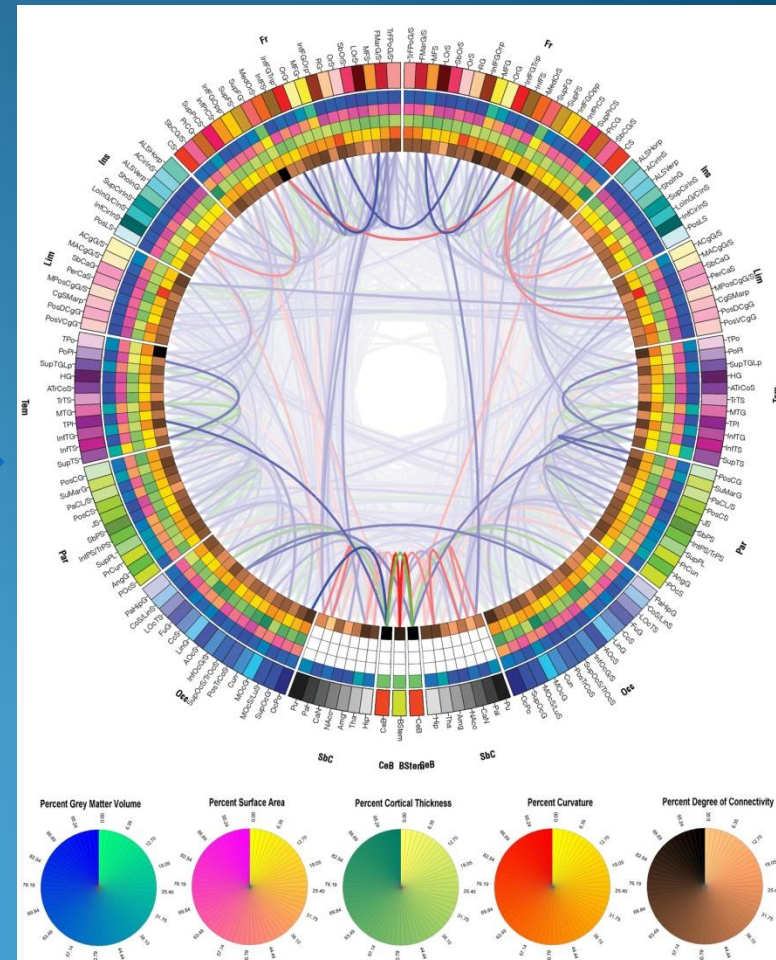
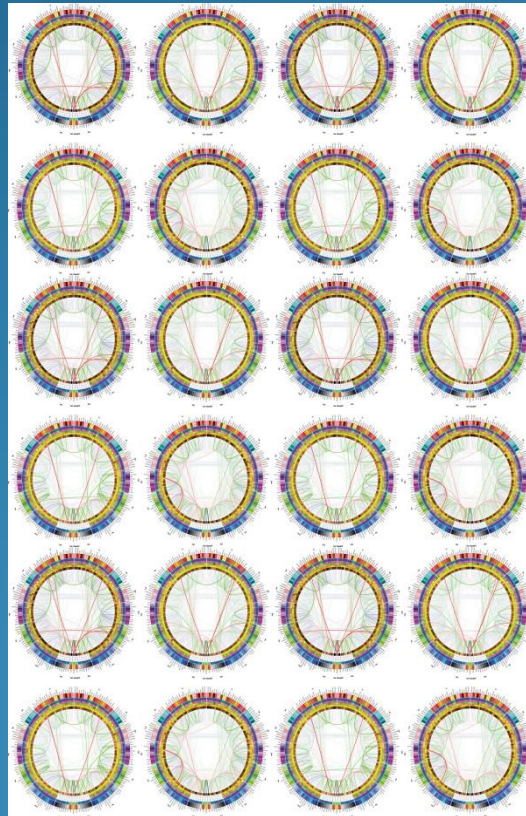
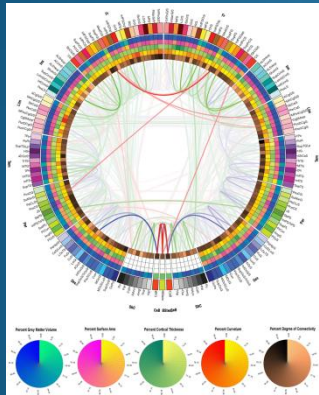


Population-level connectograms

SUBJECT

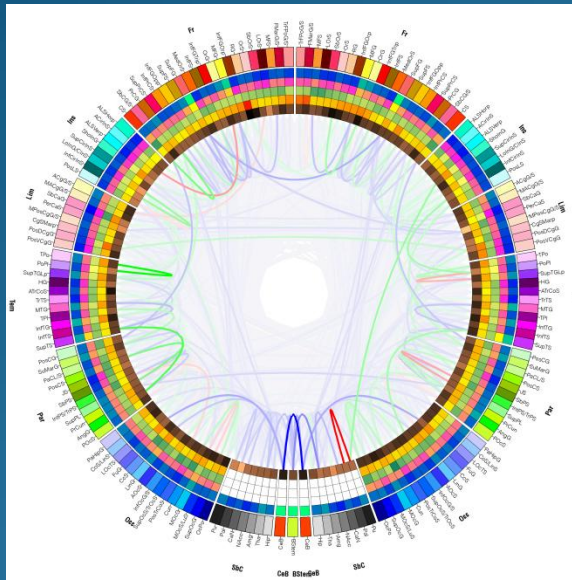
AVERAGING

POPULATION (N=110)



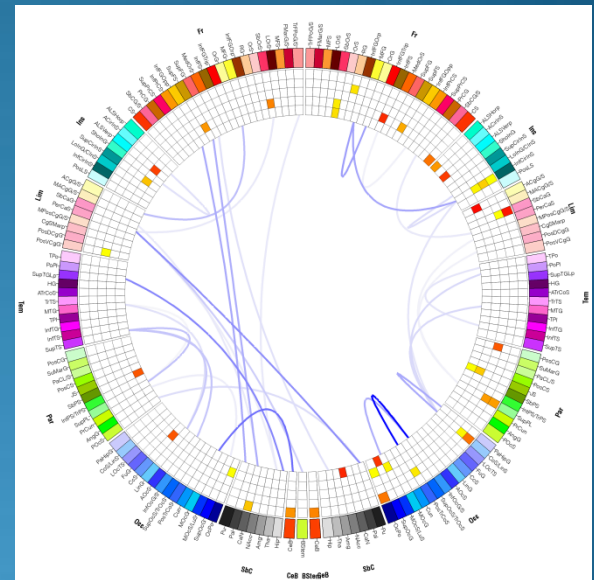
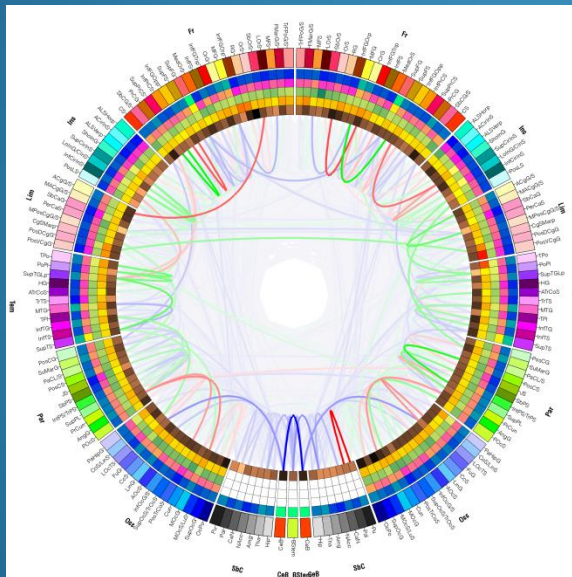
Comparing populations

HEALTHY



VS

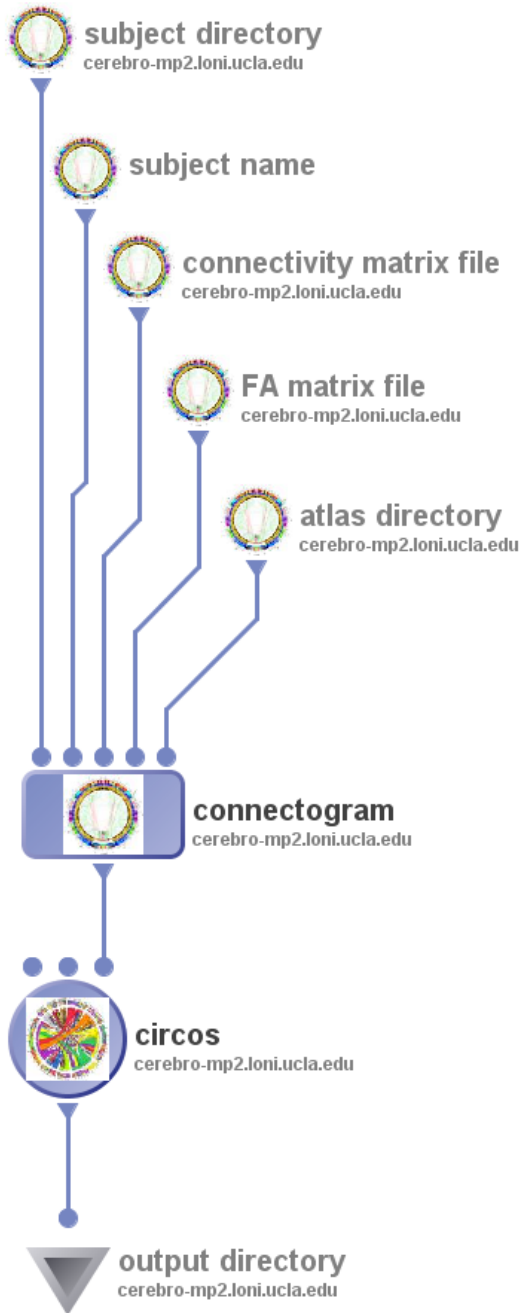
DISEASED



SIGNIFICANT
DIFFERENCES

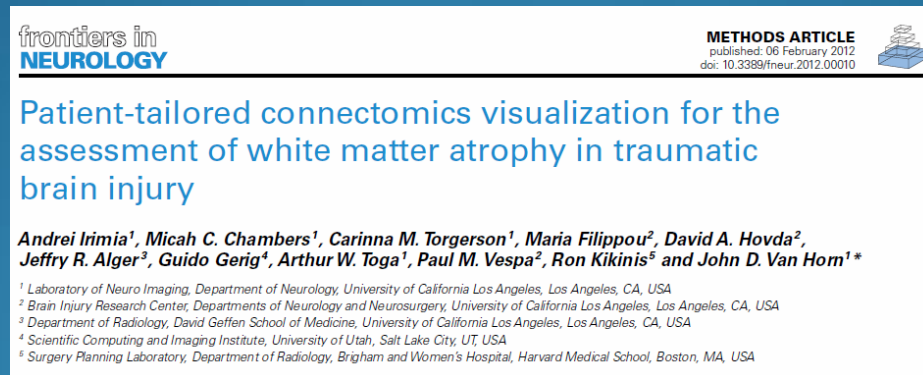
Pipeline workflow

- integrated with FreeSurfer automatic segmentation(also available through the Pipeline)
- LONI custom software uses Circos software to generate the connectogram
- the output is the connectogram image



References

- Irimia et al. (2012) Frontiers in Neurology, vol 3, article 10



- Irimia et al. (2012) NeuroImage, vol. 60, pp. 1340-1351

