

DOING MORE WITH IMAGING: THE NEUROIMAGING INITIATIVE

Charles DeCarli, MD Chair, Imaging Subcommittee;
Director, University of California, Davis

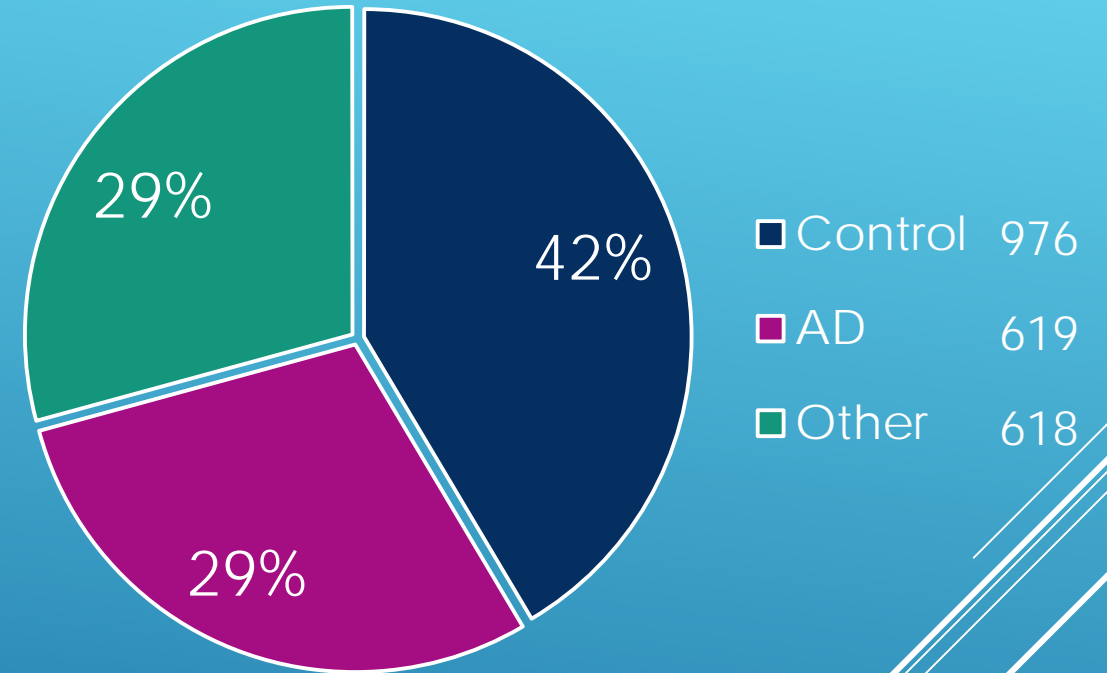
- ▶ MRI data acquisition common among ADCs
- ▶ Sites regularly contributing data to NACC
- ▶ NACC sharing DICOM data
 - ▶ 29 requests since 1/1/2015
- ▶ Funded to do preliminary analysis of a subset

STATE OF IMAGING

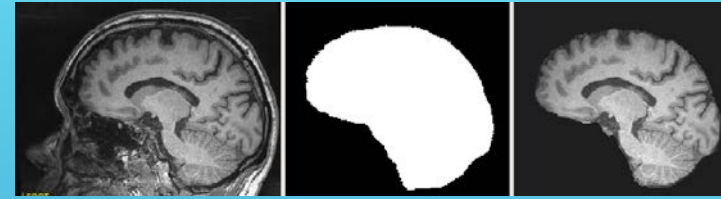


Diagnosis

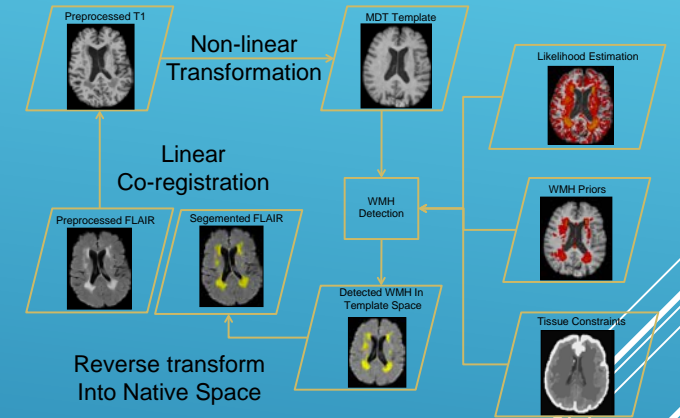
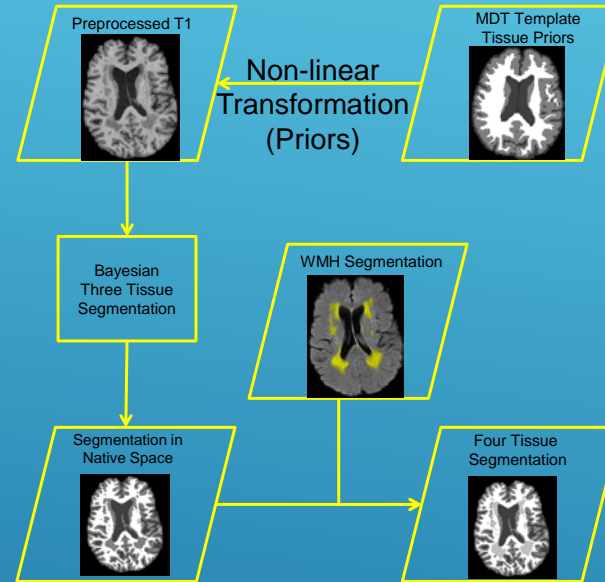
- ▶ Boston
- ▶ Columbia
- ▶ Mass General
- ▶ UC Davis
- ▶ Indiana
- ▶ Wisconsin
- ▶ Kansas
- ▶ U Penn
- ▶ Mount Sinai
- ▶ Irvine
- ▶ USC
- ▶ OHSU
- ▶ Mayo



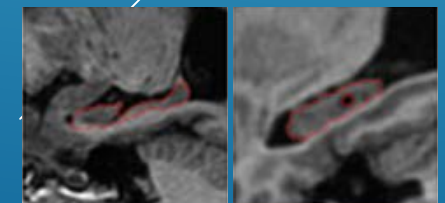
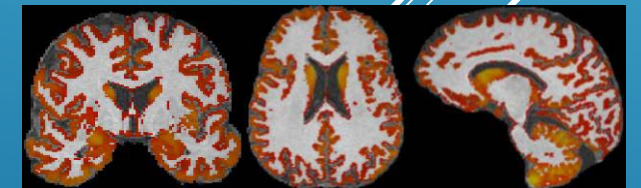
ADC MRI DICOM DATA
2213 UNIQUE INDIVIDUALS



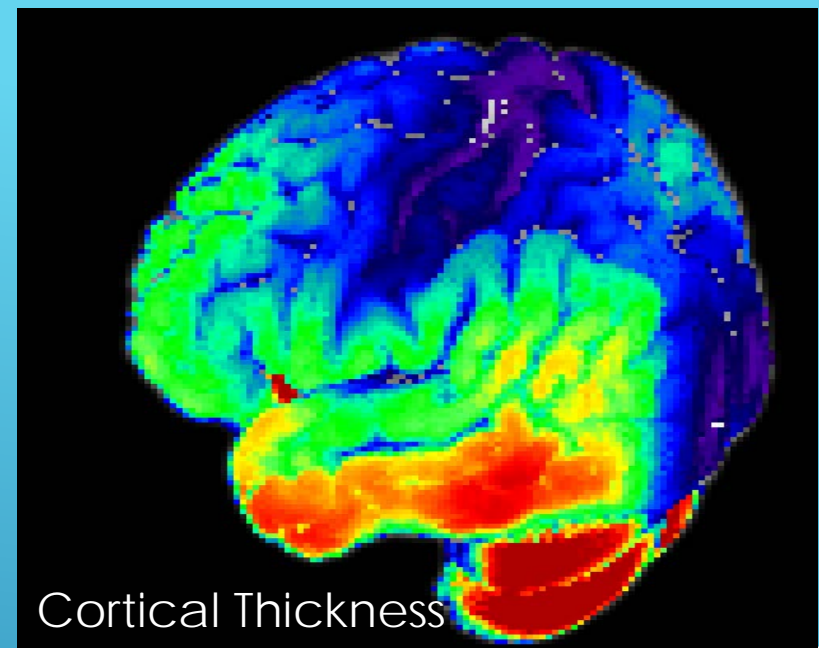
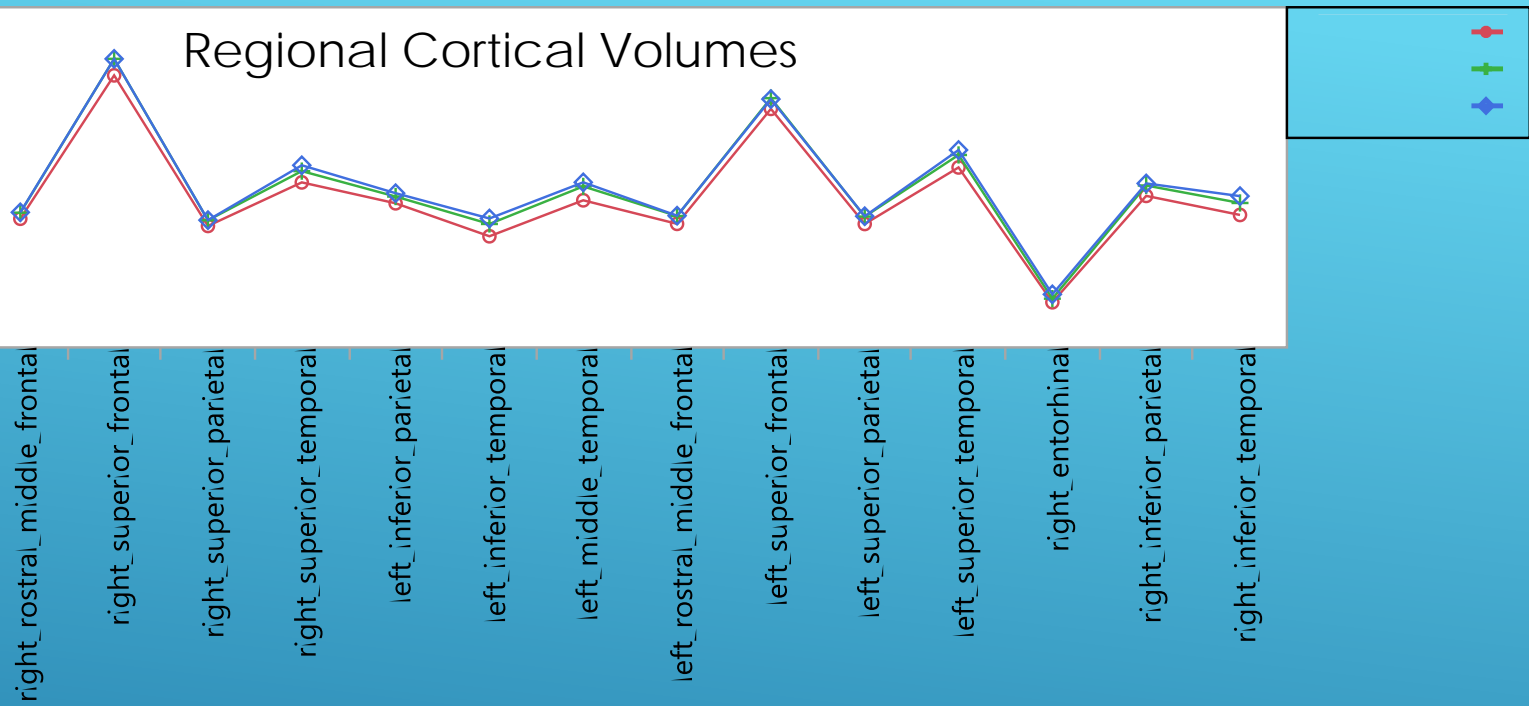
- ▶ Skull removal
- ▶ Tissue segmentation
- ▶ Cortical parcellation
- ▶ Cortical thickness
- ▶ Hippocampal volumetry



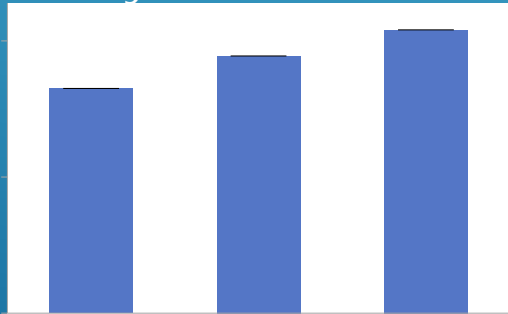
MRI ANALYSES PIPELINES



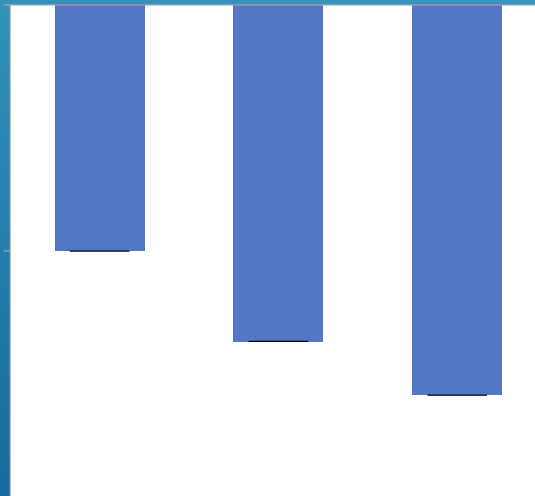
Regional Cortical Volumes



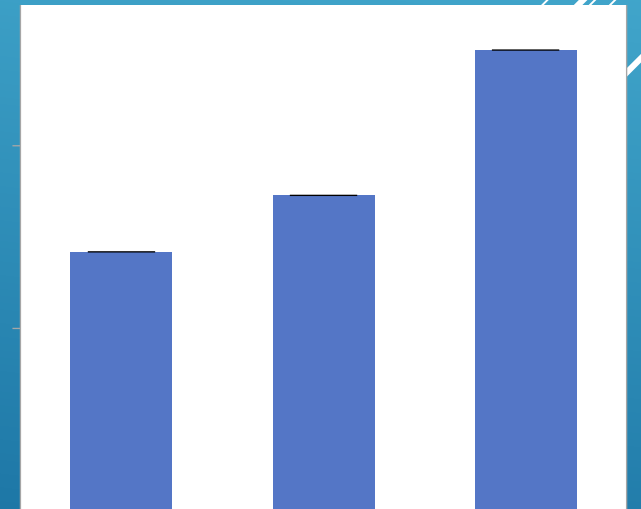
Gray Matter Volume



WMH Volume



Hippocampal Volume



PILOT MRI ANALYSIS

ADGC GWAS	ADGC Controls	ADGC AD cases	All Other Dx *	Total
	N	N	N	N
Genotype data available at ADGC	217	210	61	488
No genotype data are available at ADGC	759	409	557	1725
Total	976	619	618	2213

QUANTITATIVE MRI AND GENOTYPING

From: Phelps, Creighton (NIH/NIA) [E] [<mailto:PhelpsC@nia.nih.gov>]

Sent: Thursday, November 19, 2015 10:57 AM

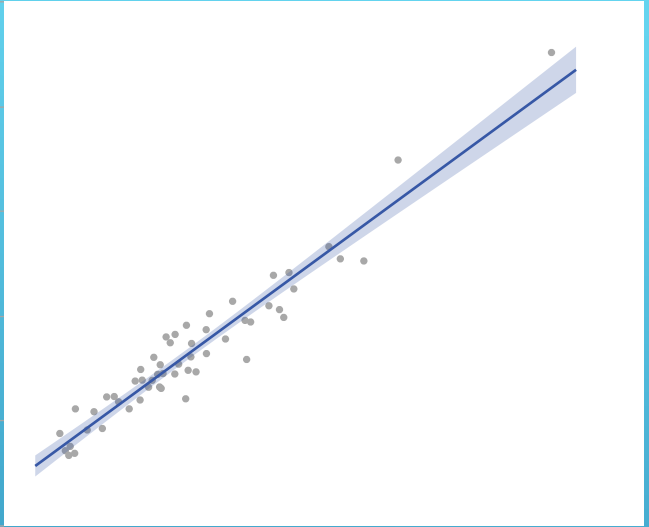
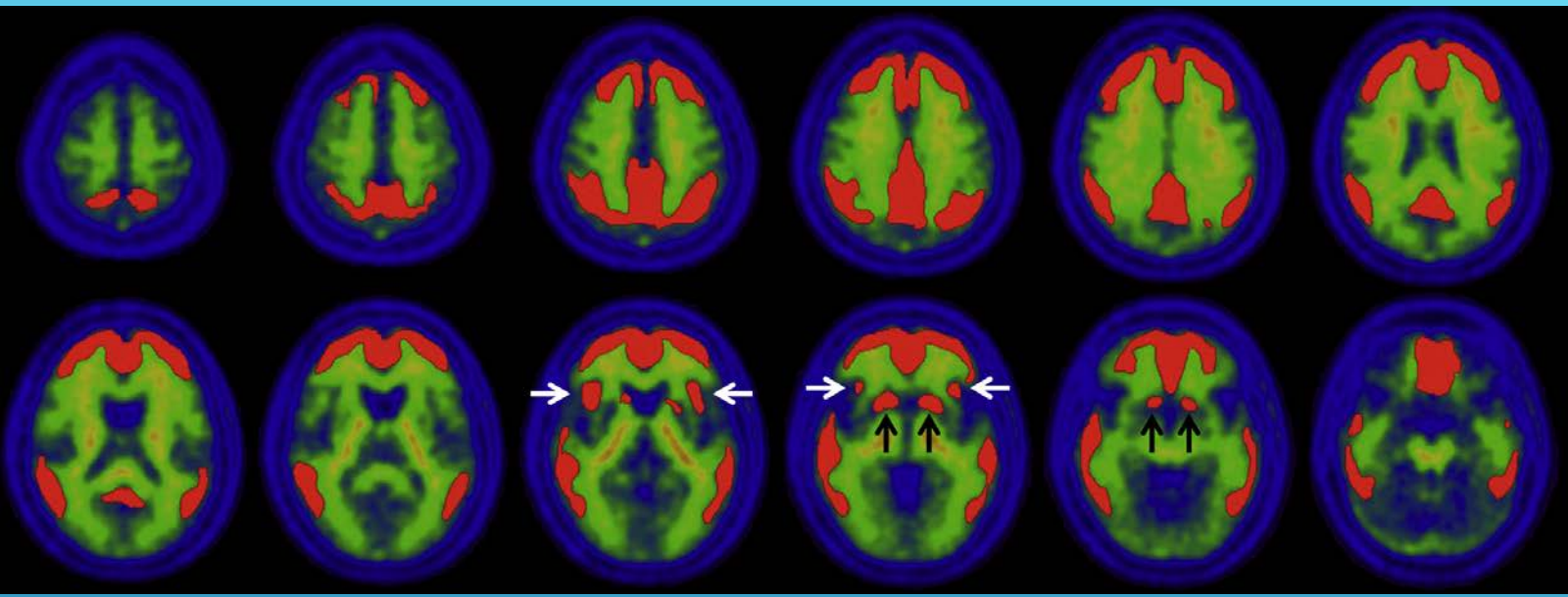
To: Kukull, Walter; Charles DeCarli; Silverberg, Nina (NIH/NIA) [E]; Buckholtz, Neil (NIH/NIA) [E]

Subject: PET images at NACC

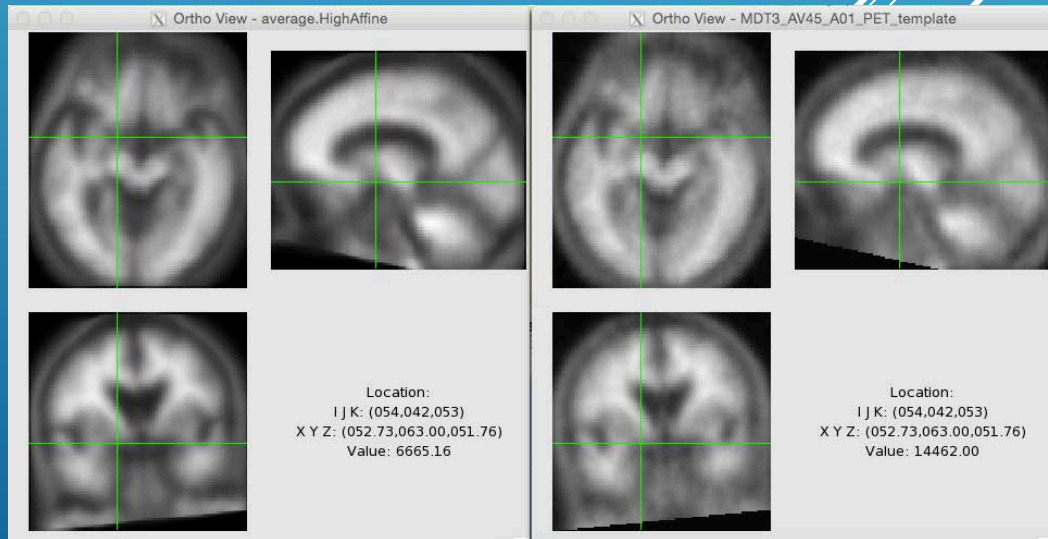
Mark Mintun has asked us whether there are any plans for NACC to collect and make such images available for other research like we do with the MRI images. I told him to chat with Charlie and Bud about the possibilities.

NACC AMYLOID PET

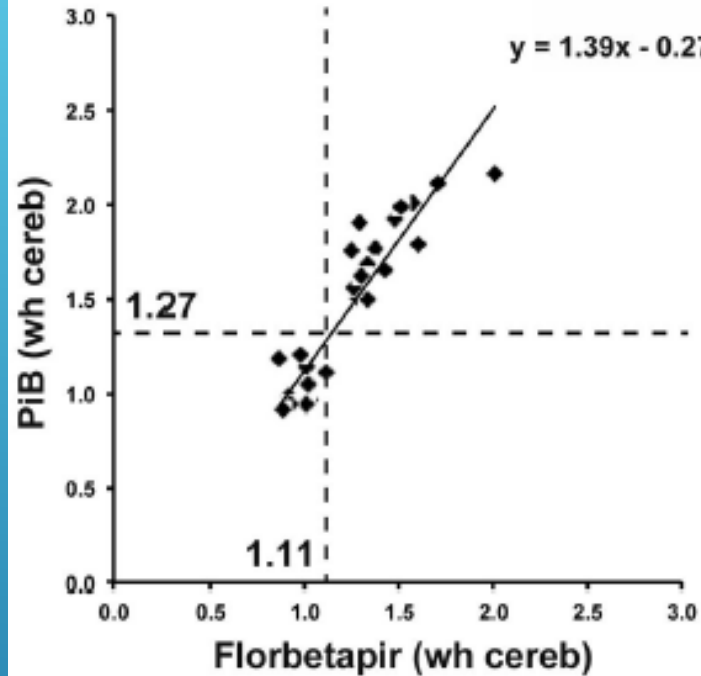




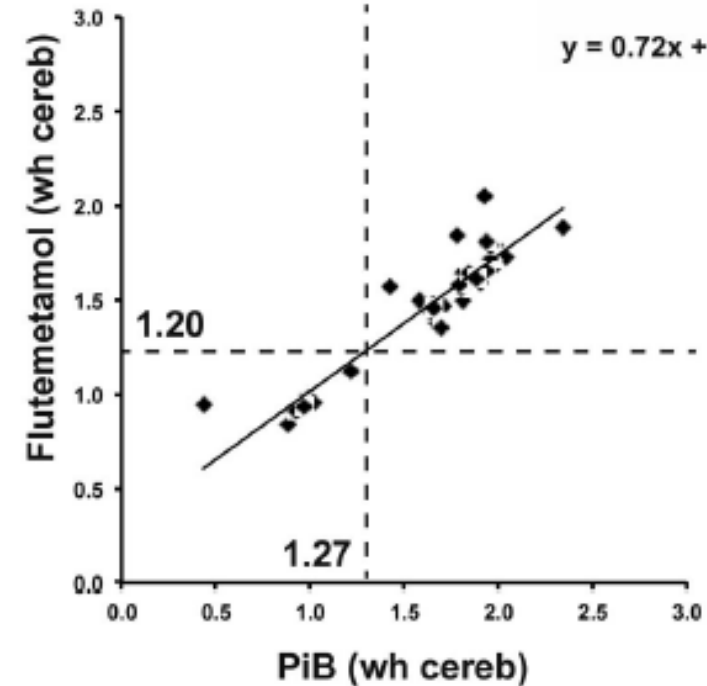
TEMPLATE VS MRI ANALYSIS



Florbetapir-based wh cereb cutoff (1.11)
converted to PiB wh cereb units (1.27)



Florbetapir-based PiB wh cereb (1.27) cutoff
converted to flutemetamol wh cereb units (1.20)



ANALYSIS ACROSS LIGANDS

Landau et al. Amyloid PET imaging in Alzheimer's disease:
a comparison of three radiotracers. Eur J Nucl Med
Mol Imaging. 2014

- ▶ Neuroimaging is a common and excellent biomarker
- ▶ NACC has made an imaging repository available
 - ▶ Can expand to amyloid PET
- ▶ Automated image processing pipelines exist
 - ▶ Preliminary data suggests that this feasible
- ▶ Available analysis could benefit sites without strong imaging backgrounds and/or junior investigators

CONCLUSIONS

