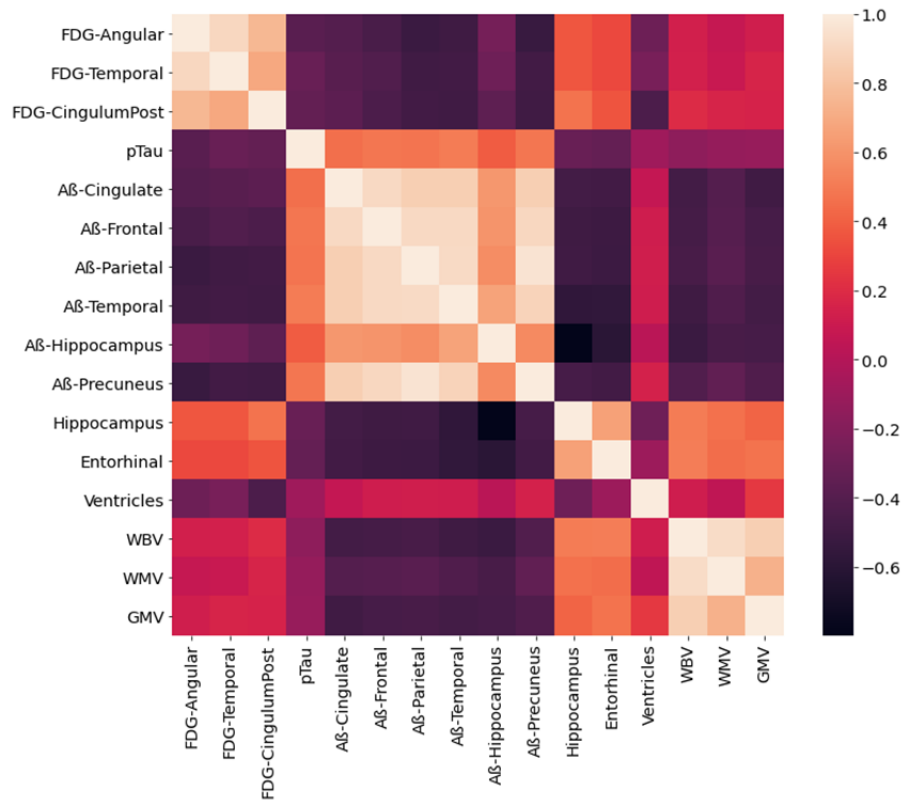


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3  **$\beta$ -Amyloid and Tau Drive Early Alzheimer’s Disease Decline While Glucose**  
4 **Hypometabolism Drives Late Decline**  
5

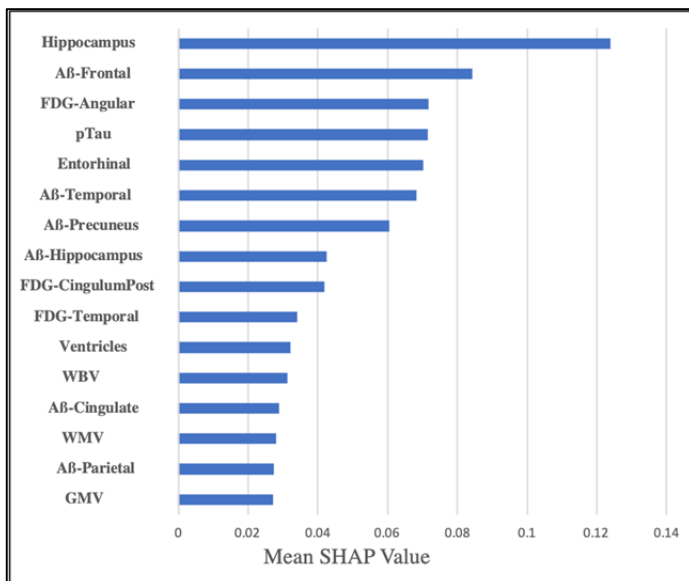
6 Data used in preparation of this article were obtained from the Alzheimer’s Disease Neuroimaging  
7 Initiative (ADNI) database (adni.loni.usc.edu). As such, the investigators within the ADNI contributed  
8 to the design and implementation of ADNI and/or provided data but did not participate in analysis or  
9 writing of this report. A complete listing of ADNI investigators can be found at the end of the  
10 supplementary information.  
11



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14 **Supplementary Figure 1. Correlation Heatmap of biomarker features.** Heatmap depicting  
15 how the biomarker features were correlated one with another. The color legend is representative  
16 of pearson correlation r values.  
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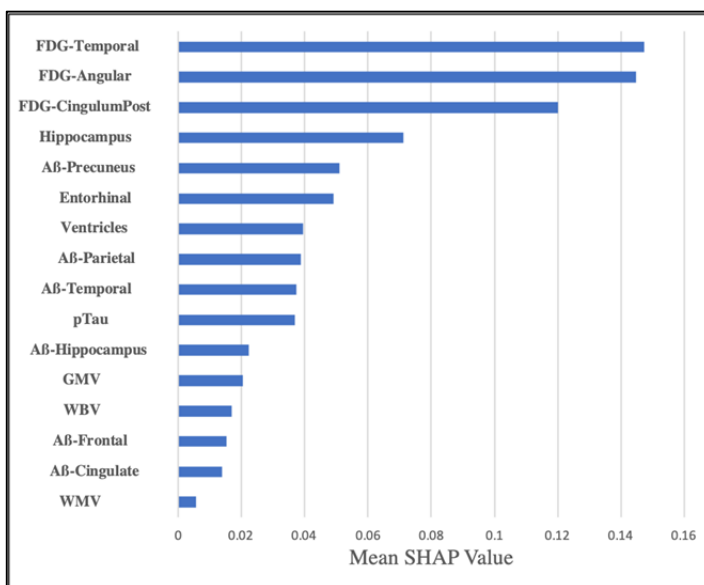
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### CU vs. LMCI:



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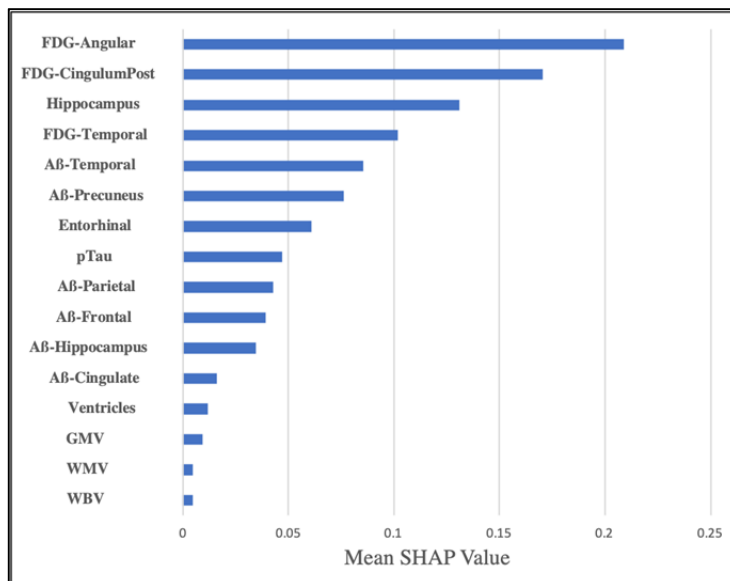
### LMCI vs. AD:



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### CU vs. AD:



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### Supplementary Figure 2. SHAP Analysis depicting biomarker feature ranking importance.

Comparison of feature ranking analysis from implementation of the SHapley Additive exPlanations (SHAP) technique. The bar plots shows feature impacts on the cognitively unimpaired (CU) vs late mild cognitive impairment (LMCI) analysis, the LMCI vs Alzheimer's disease (AD) analysis, and the CU vs AD analysis.

56 **Supplementary Table 1. Accuracy results of all features and Top 8 features in Random Forest**  
 57 **model from A) three- and B) ten-fold cross validation.**

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A) K-fold=3

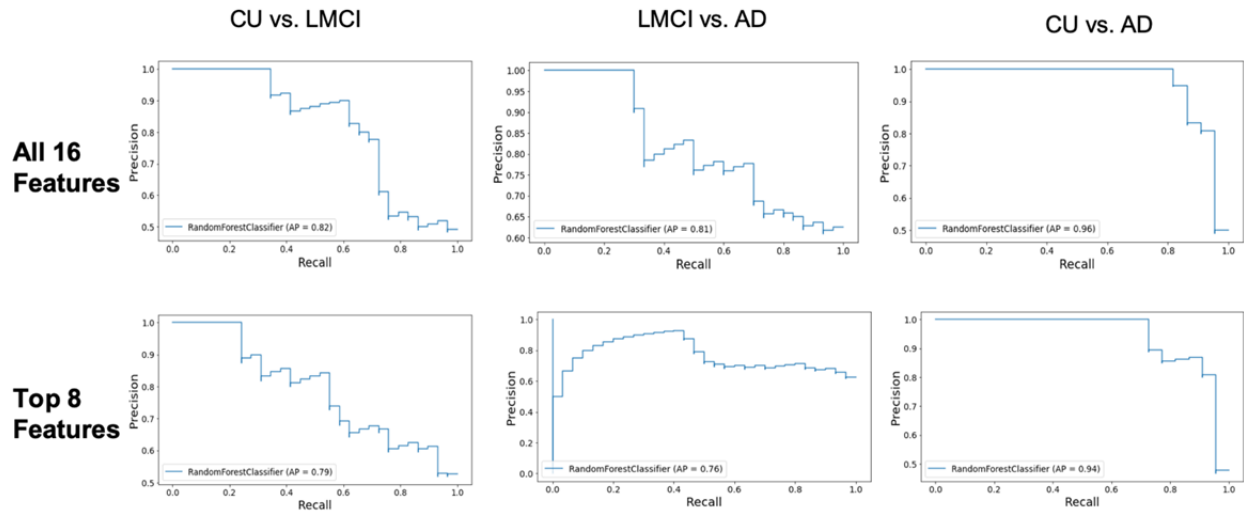
<b>All Features</b>			
	CU vs. LMCI	LMCI vs. AD	CU vs. AD
Accuracy (%)	72.26	72.42	90.90
F1-score (%)	72.15	72.37	90.88
<b>Top 8 Features</b>			
	CU vs. LMCI	LMCI vs. AD	CU vs. AD
Accuracy (%)	72.34	71.60	91.40
F1-score (%)	72.21	71.59	91.38

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B) K-fold=10

<b>All Features</b>			
All Features	CU vs. LMCI	LMCI vs. AD	CU vs. AD
Acc.	72.15	71.45	90.62
F1-score	71.92	71.03	90.60
<b>Top 8 Features</b>			
Top 8 Features	CU vs. LMCI	LMCI vs. AD	CU vs. AD
Acc.	71.19	70.49	91.86
F1-score	70.98	70.15	91.81

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**Supplementary Figure 3.** Comparison of precision recall (PR) curves between all 16 biomarker features (top) and the top 8 biomarker features (bottom) from the three diagnosis participant group comparisons: cognitively unimpaired (CU) vs late mild cognitive impairment (LMCI), LMCI vs Alzheimer's disease (AD), and CU vs AD. The Average of Precision (AP) is calculated to see the average precision of each model under different possible thresholds.

77 **Supplementary Table 2. Accuracy results of all features in Gradient Tree Boosting model from A)**  
78 **three-, B) five-, and C) ten-fold cross validation.**

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80 A) K-fold =3  
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<b>All Features</b>			
	<b>CU vs. LMCI</b>	<b>LMCI vs. AD</b>	<b>CU vs. AD</b>
<b>Accuracy (%)</b>	70.16	70.41	91.47
<b>F1-score (%)</b>	69.97	70.34	91.44

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84 B) K-fold=5  
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<b>All Features</b>			
	<b>CU vs. LMCI</b>	<b>LMCI vs. AD</b>	<b>CU vs. AD</b>
<b>Accuracy (%)</b>	72.30	71.26	91.87
<b>F1-score (%)</b>	72.24	71.01	91.80

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87 C) K-fold=10  
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<b>All Features</b>			
	<b>CU vs. LMCI</b>	<b>LMCI vs. AD</b>	<b>CU vs. AD</b>
<b>Accuracy (%)</b>	70.51	70.73	92.63
<b>F1-score (%)</b>	70.29	70.36	92.61

89

## ACKNOWLEDGEMENT LIST FOR ADNI PUBLICATIONS

The Data and Publications Committee, in keeping with the publication policies adopted by the ADNI Steering Committee, here provide lists for standardized acknowledgement. The list consists of three parts: I. ADNI Infrastructure Investigators and Site Investigators, II. DOD ADNI Infrastructure Investigators and Site Investigators and III. ADNI Depression Infrastructure Investigators and Site Investigators. Infrastructure Investigators represent the names responsible for leadership and infrastructure. Site Investigators represent the names of individuals at each recruiting site. All papers, including methodological papers, should have an acknowledgement list that consists of Infrastructure Investigators plus the FULL list.

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## **ADNI Depression**

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