

**Docket #:** S20-375

# **Predicting Future Images and Imaging Biomarkers with Deep Learning**

Researchers at Stanford University present a method to predict biomarkers that are correlated with poor disease prognosis from imaging data. While advances in radiology are currently focused on patient diagnosis and therapy selection, an artificial intelligence method to quantitatively stratify patient risk and prognosis may improve clinical trial assessment and enable development of personalized medicine. As a proof of concept, the invention identifies position emission tomography (PET) image features, which is further used along with clinical, demographic, and genetic markers to predict change in accumulation of a brain amyloid deposition biomarker in Alzheimer's disease patients. Compared to existing methods that do not incorporate imaging information, the invention is able to identify individuals in the top 10% ground-truth progressors at 2-4-fold higher rates.

## **Stage of Development**

Proof of concept using an open-source dataset for model training and testing.

## **Applications**

- Software application to identify clinical trial enrollment patients

## **Advantages**

- Prediction of disease prognosis improves patient risk stratification
- Improved prediction of disease prognosis and biomarkers may enable development of novel personalized therapeutics
- Presented invention for biomarker prediction outperforms existing methods

## Publications

- Reith FH, Mormino EC, Zaharchuk G. [Predicting future amyloid biomarkers in dementia patients with machine learning to improve clinical trial patient selection.](#) Alzheimers Dement (NY). 2021 Oct 14;7(1):e12212. doi: 10.1002/trc2.12212.

## Patents

- Published Application: [20220223231](#)

## Innovators

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