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Genomics of Risk and Resistance to Cognitive Aging and AD

Population Studies: Healthy adults 18-95, cross-sectional – MindCrowd; >100K participants
(our goal is longitudinal)
Common and Rare Examples of Alzheimer's disease, cross-sectional

Methods: Functional Genomics, Electronic Cohort Recruitment and Study

We investigate the genomics of risk and resistance to cognitive aging and Alzheimer's disease using internet-based cohort recruitment and by partnering with clinical teams who have patients with unique dementia presentations (young onset with no family history, APOE E4 homozygotes with no or limited neuropathology, etc…). We utilize genomic approaches to make early risk estimations and to identify new drug targets that can be exploited for general cognitive enhancement or AD prevention.

Concepts Used In Research

Resistance → Resistance is a trait that can be defined by a single observation.

- An 80-year-old APOE E4 homozygote who's brain at autopsy is devoid of amyloid/tau pathology.
- An aging individual whose cognitive performance is significantly (2 S.D. from the mean) better than their matched peers.

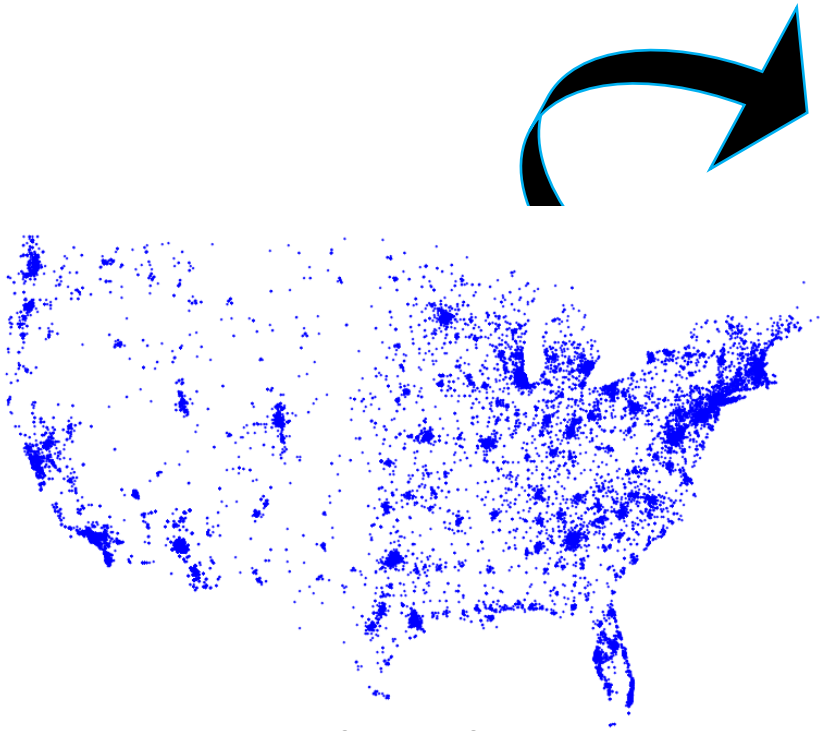
To study resistance one must be able to assess a person's risk (genetic and non-genetic) as deeply as possible to determine if they are avoiding risk or simply were at low risk in the first place.

Resilience → Resilience is a trait that must leverage multiple, longitudinal measurements – it is not necessarily specific to pathology or disease.

A "bending without breaking" or an "ability to return back to a prior state".

- One measurement above the "threshold", one below the threshold, and a third measurement back above the threshold would indicate resilience.

Our Search for Resistance to Cognitive Aging



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