Auditory Cortical Activity Measures Identify Those Individual Mild Cognitive Impairment (MCI) Subjects Who Will Convert to Alzheimer's Dementia (AD)

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Auditory Cortical Activity Measures Identify Those Individual Mild Cognitive Impairment (MCI) Subjects Who Will Convert to Alzheimer’s Dementia (AD)

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Golob and Starr (in Brain, 2008) showed that auditory cortical activity measures differ significantly between young and old controls, and between older controls and MCI, and demented. The study also identified that those MCI subjects at onset to the study who had larger than normal amplitude of the N100 component to tone onset were likely to convert to AD within 5 years. The present study used projection pursuit, a non-linear computational modelling technique, to identify a combination of signal components that maximally discriminates MCI (n=30), AD (n=14), and age-matched normals (n=43). Optimal separation between groups was obtained when the identified number of signal components was between 10 and 20. After training, the algorithm accurately categorized individual cases from all groups (>80% accuracy) and identified MCI subjects that converted (n=14) to AD or did not (n=16). These data provide evidence that complex measures of auditory signals can be uncovered by non-linear modelling to aid in the establishment of dementia-related biomarkers.