**ANALYSIS AND CORRELATION BETWEEN WHOLE GENOME SEQUENCE AND BRAIN ACTIVITY FOR THE DIAGNOSIS ENHANCEMENT OF ALZHEIMER’S DISEASE**

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### CURRENT STATE OF THE ART

**Alzheimer’s Disease (AD)**

Progressive neurodegenerative disorder

- Cognitive impairment
- Behavioural disorders
- Memory loss
- Attention deficit
- Abstract reasoning loss...

**Disease main risk factors**

- Age (rises exponentially)
- Genetics
- Environment and habits

**Disease prevalence**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 65 years</td>
<td>26.8%</td>
<td>17%</td>
</tr>
<tr>
<td>65 - 74 years</td>
<td>38.8%</td>
<td></td>
</tr>
<tr>
<td>75 - 84 years</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>+ 85 years</td>
<td>4.5%</td>
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- AD
- Vascular dementia
- Other dementia

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**Problem**

Complex and subjective diagnosis

- Medical history
- Physical exam and diagnostic tests
- Mental status and mood testing
- Neurological exams

**Definite AD diagnosis**

Aβ plaques  
Tau protein tangles

Via necropsy (*post mortem*)

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**Objective**

Simplify and improve AD diagnosis mainly at the early stages

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### METHODS

**Brain activity**  
**EEG recording**  
**Genetics**  
**Genome sequencing**

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### CORRELATION ANALYSIS

**Clustering analysis**

**Phylogenetic analysis**

UPGMA Algorithms  
Neighbor-net

Single, complete and average linkage algorithms

Comparison with clinical data

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**Early diagnosis**  
**Effective treatments**