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Ubisol Q-10 in Combination with Methylene Blue as a Treatment for Alzheimer’s Disease in a Transgenic Mouse Model

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**Introduction**

Alzheimer’s disease (AD) is a progressive neurodegenerative disorder often associated with memory impairment. According to the World Health Organization, approximately 48 million people worldwide live with the disease and this number is expected to triple by 2050.\(^1\)

As AD is a poorly understood disease, there is currently no cure for the degeneration it causes. However, some studies have shown a link between Alzheimer’s disease and oxidative stress. Elevated reactive oxygen species (ROS) are a result of inefficiency in the electron transport chain in the mitochondria and can induce premature cellular senescence. The death of these neurons can lead to the formation of neurofibrillary tangles and amyloid plaques, characteristic of the disease, in regions of the hippocampus and cerebral cortex.

**Methodology**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1. Control Group</td>
<td>No treatment</td>
</tr>
<tr>
<td>2. Ubisol-Q(_{10})</td>
<td>Oral-supplemented(6mg/kg/day)</td>
</tr>
<tr>
<td>3. Methylene Blue</td>
<td>Injected(4mg/kg/day)</td>
</tr>
<tr>
<td>4. Ubisol-Q(_{10}) and Methylene Blue</td>
<td>Both injection (MB) and oral-supplement (CoQ(_{10}))</td>
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</tbody>
</table>

**Behavioural Studies**

- In partnership with Dr. Jerome Cohen’s psychology research lab, mice in various groups will be subject to various tests of memory and cognition.

**Amyloid-β Levels**

- After 1.5 years, mice will be sacrificed and blood cells will be analyzed for amyloid-β proteins through ELISA.
- Various staining techniques will be implemented to quantitatively assess the presence of amyloid-β plaques through Congo Red and anti-human amyloid-β antibody staining.

**Glia Cell Activation**

- Astrocytes: detection of astrocytes will be primarily through glial fibrillary acidic proteins (GFAP) identification.
- Microglia: Iba1 (ionized calcium-binding adapter molecule 1) will be monitored for microglia activation.

**References**