Review of: "Targeting Alzheimer's disease hallmarks with the Nrf2 activator Isoeugenol"

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Potential competing interests: No potential competing interests to declare.

The article "Targeting Alzheimer's Disease Hallmarks with the Nrf2 Activator Isoeugenol" by Ana Silva et al. presents a comprehensive study on the effects of Isoeugenol, a skin allergen with electrophilic properties, in both in vitro and in vivo models related to Alzheimer's Disease (AD). The study investigates Isoeugenol's potential to cross the blood-brain barrier, its antioxidant and anti-inflammatory properties, and its impact on Aβ peptide levels and Nrf2 pathway activation. Isoeugenol demonstrated promising results in reducing AD hallmarks, including decreased Aβ levels and improved cognitive functions in mouse models, suggesting its potential as a therapeutic agent for AD.

Review Report:

1. **Strengths**:

- The research addresses a critical need for novel AD treatments with a creative approach by leveraging Isoeugenol.

- The study design includes both in vitro and in vivo experiments, providing a comprehensive analysis of Isoeugenol's effects.

- The use of various models and methods (e.g., PAMPA assay for BBB permeability, ELISA for Aβ levels, Western blotting for pathway analysis) strengthens the findings.

2. **Weaknesses**:

- The study's reliance on animal models may limit the direct translatability of the findings to human AD pathology.

- Details on the statistical methods and analyses could be more thoroughly explained to ensure the robustness and reproducibility of the results.

3. **Recommendations for Improvement**:

- Future studies should include diverse animal models and eventually progress to human clinical trials to validate the therapeutic potential of Isoeugenol.

- A more detailed discussion on the mechanism of action of Isoeugenol and its interaction with AD pathology would enrich the study.

- Expanding on the statistical analysis methods and criteria for significance would enhance the credibility of the results.

Overall, the study presents a novel and promising approach to AD treatment, with Isoeugenol showing potential benefits in reducing AD hallmarks. Further research is needed to fully understand its therapeutic potential and application in human AD treatment.