



**Università degli Studi di Napoli Federico II**

**PhD in Biotechnology - 38<sup>th</sup> cycle**

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**“A natural nutraceutical-based strategy in management and prevention of neurodegenerative diseases”**

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Neurodegenerative diseases are becoming increasingly prevalent and are expected to triple by 2050. These diseases are caused by mechanical insults, ischemic events, and microbial infections, which damage the brain components and trigger the release of self-antigens. Microglial cells recognize these antigens and become active, releasing pro-inflammatory cytokines that activate astrocytes. The activated astrocytes attack neurons, causing neurological damage. Unfortunately, current treatments only work before astrocyte activation and have limiting side effects. Formyl Peptide Receptors play a crucial role in microglial activation and can bind both anti-inflammatory and pro-inflammatory ligands. Apple peel extracts (APe), rich in Ursolic acid, could be used as a pre-treatment strategy based on a natural compound for the prevention and management of neurodegenerative disorders. Additionally, the recovery of APe would allow the production of cost-effective UA-based phytochemicals, which would be available to most of the population. This approach could pave the way for a new therapeutic method based on prevention, which is safe and appealing to companies looking to obtain a circular production.

## **References**

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2. Doens, D. et al. Microglia receptors and their implications in the response to amyloid  $\beta$  for Alzheimer's disease pathogenesis. *Journal of neuroinflammation*, 11(1), pp.1-14.