IDENTIFICATION OF NATURAL POLYPHENOLS AND EXTRACTS ACTING AS INHIBITORS OF AMYLOID-BETA (\(\text{A}\beta_{1-42}\)) DERIVED CELLULAR DAMAGE

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Introduction: The number of individuals with Alzheimer's disease is constantly increasing in parallel with life expectancy. Despite its prevalence, an efficient treatment for the disease is still lacking. Natural molecules and plant extracts have shown promise in developing therapeutic agents aimed at halting \(\text{A}\beta\) cellular damage characteristic in brains of Alzheimer disease patients.

Aims: The aim of this study was to identify whether small-molecule compounds and bioactive natural extracts can act as inhibitors of \(\text{A}\beta_{1-42}\)-induced damage in SH-SY5Y cells.

Methods: A total of 17 polyphenols and 4 plant extracts were screened using the XTT assay to obtain cytotoxicity profiles for each. This data together with that obtained from the liposomal studies were used to narrow down the array of natural plant compounds to the four most efficient polyphenols and extracts - nordihydroguaretic acid, baicalein, black tea and Padina extract. For this study the fresh \(\text{A}\beta_{1-42}\) protein was used since it offered at least 30% toxicity at a concentration of 5 \(\mu\text{M}\).

Results: Our data showed that nordihydroguaretic acid, baicalein and Padina extract significantly inhibited \(\text{A}\beta_{1-42}\)-induced cellular damage. Interestingly, these compounds were also found to significantly inhibit lipid membrane damage by aggregated \(\text{A}\beta\).

Conclusions: The results obtained showed the inhibitory activity of three of the natural plant products against \(\text{A}\beta_{1-42}\) derived cellular damage. These could serve as lead compounds in developing new therapeutic agents for the treatment of Alzheimer’s disease.