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## Green tea EGCG may help prevent plaque formation in Alzheimer's disease

By Nathan Gray , 06-Mar-2013

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**Extracts from green tea may block the formation of beta-amyloid plaques that have been linked to the onset of Alzheimer's disease and other neurodegenerative conditions, according to new laboratory data.**

The study, published in the *Proceedings of the National Academy of Sciences*, reports that green tea extract, and in particular the powerful polyphenol epigallocatechin-3-gallate (EGCG) prevented the formation of potentially dangerous beta-amyloid aggregates and broke down existing aggregate structures in proteins that contained metals - specifically copper, iron and zinc.

The aggregation of these proteins, called metal-associated amyloids, is associated with Alzheimer's disease and other neurodegenerative conditions, explained the research team behind the study.

"A lot of people are very excited about this molecule," said Dr Mi Hee Lim from the University of Michigan, USA - who noted that EGCG and other flavonoids in natural products have long been established as powerful antioxidants.

### Tea facts

The majority of science on tea has looked at green tea, with benefits reported for reducing the risk of Alzheimer's and certain cancers, improving cardiovascular and oral health, as well as aiding in weight management.

Green tea contains between 30 and 40% of water-extractable polyphenols, while black tea (green tea that has been oxidized by fermentation) contains between 3 and 10%. Oolong tea is semi-fermented tea and is somewhere between green and black tea. The four primary polyphenols found in fresh tealeaves are epigallocatechin gallate (EGCG), epigallocatechin, epicatechin gallate, and epicatechin.

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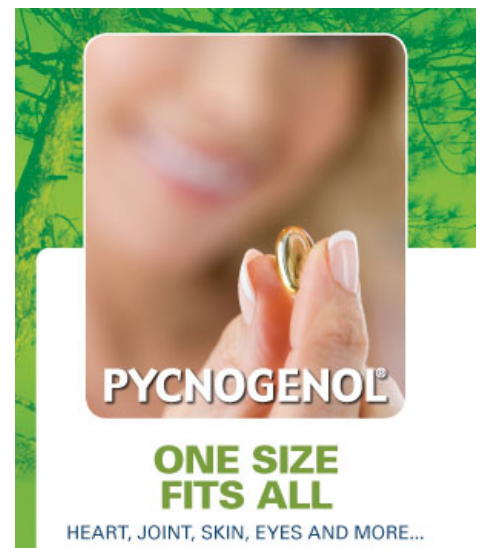
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### Limited perspective

However, Lim explained that while many researchers are investigating small molecules such as EGCG and their effect on metal-associated amyloid plaques, most of them are looking from a limited perspective.

"We used a multidisciplinary approach," said Lim, who led the new study.

"This is the first example of structure-centric, multidisciplinary investigations by three principal investigators with three different areas of expertise," she explained, noting that the research team behind the work included chemists, biochemists and biophysicists.

"We believe you have to have a lot of approaches working together, because the brain is very complex," she said, explaining that the current PNAS findings are a starting point.

Lim said her team's next step is to try and 'tweak' EGCG and then test its ability to interfere with plaque formation in fruit flies.

"We want to modify them for the brain, specifically to interfere with the plaques associated with Alzheimer's," she said.

Source: PNAS

Published online ahead of print, doi:10.1073/pnas.1220326110

"Insights into anti-amyloidogenic properties of the green tea extract (-)-epigallocatechin-3-gallate toward metal-associated amyloid- $\beta$  species"

Authors: Suk-Joon Hyung, Alaina S. DeToma, Jeffrey R. Brender, Sanghyun Lee, *et al*

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