Dietary Factors Associated with Attenuation of Alzheimer’s Disease

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Alzheimer’s Brain

Pathology

Amyloid Plaques

Aβ Fibrils

Understand how diet influence the way in which Aβ self-assembles

Identify and characterize natural compound inhibitors of Aβ aggregation

Characterize cellular consequences of inhibition of Aβ aggregation

0
500
1000
0 2 4 6
Time, h
F
Control

Nichols et al. (2002)
Biochemistry, 41: 6115-27
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Courtesy of D. Dickson, Mayo Clinic, Jacksonville
Diets high in omega-3 fatty acids are associated with a reduced risk of AD.
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supported phospholipid bilayer

Au/SiO$_2$ electrode surface

70:30 POPC:DPPC

$\Delta m$ (pmol cm$^{-2}$)

% activity

0.0

0.2

0.4

0.6

0.0

0.2

0.4

0.6

POP C:DPPC

POP C
Diets high in plant-derived polyphenols correlate with a reduced risk of AD.

Quercetin (QUE)

Monomer — Oligomers — Intermediates — Fibrils

<table>
<thead>
<tr>
<th>Fr</th>
<th>0.00</th>
<th>0.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>CONT</td>
<td>FLA</td>
</tr>
<tr>
<td>20</td>
<td>API</td>
<td>LUT</td>
</tr>
<tr>
<td></td>
<td>KAE</td>
<td>QUE</td>
</tr>
</tbody>
</table>

† †

***

Flavonoids (FLA), Apigenin (API), Luteolin (LUT), Kaempferol (KAE), Quercetin (QUE)
Diets high in plant-derived polyphenols correlate with a reduced risk of AD.

Quercetin (QUE)
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Fraction of Apoptotic Cells (FITC/DAPI)

Integrated Fluorescence (A.U.) (Fraction of Control)

FLA API LUT QUE
0.00
0.25
0.50
0.75
1.00
***
*** ***
***
† †
++
+
++
++

Oligomers Formed (Fraction of Control)

Integrated Fluorescence (A.U.)

FLA API LUT QUE
0.0
0.5
1.0
1.5
2.0
2.5
*
+++
†
†††
*
+

Fraction of Apoptotic Cells (FITC/DAPI)

CONT Ab FLA API LUT KAE QUE H2O2
0.0
0.2
0.4
0.6
0.8
1.0
*

H2O2

CONT
A
FLA
API
LUT
KAE
QUE
H2O2
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