

# Inflammasjon og demens

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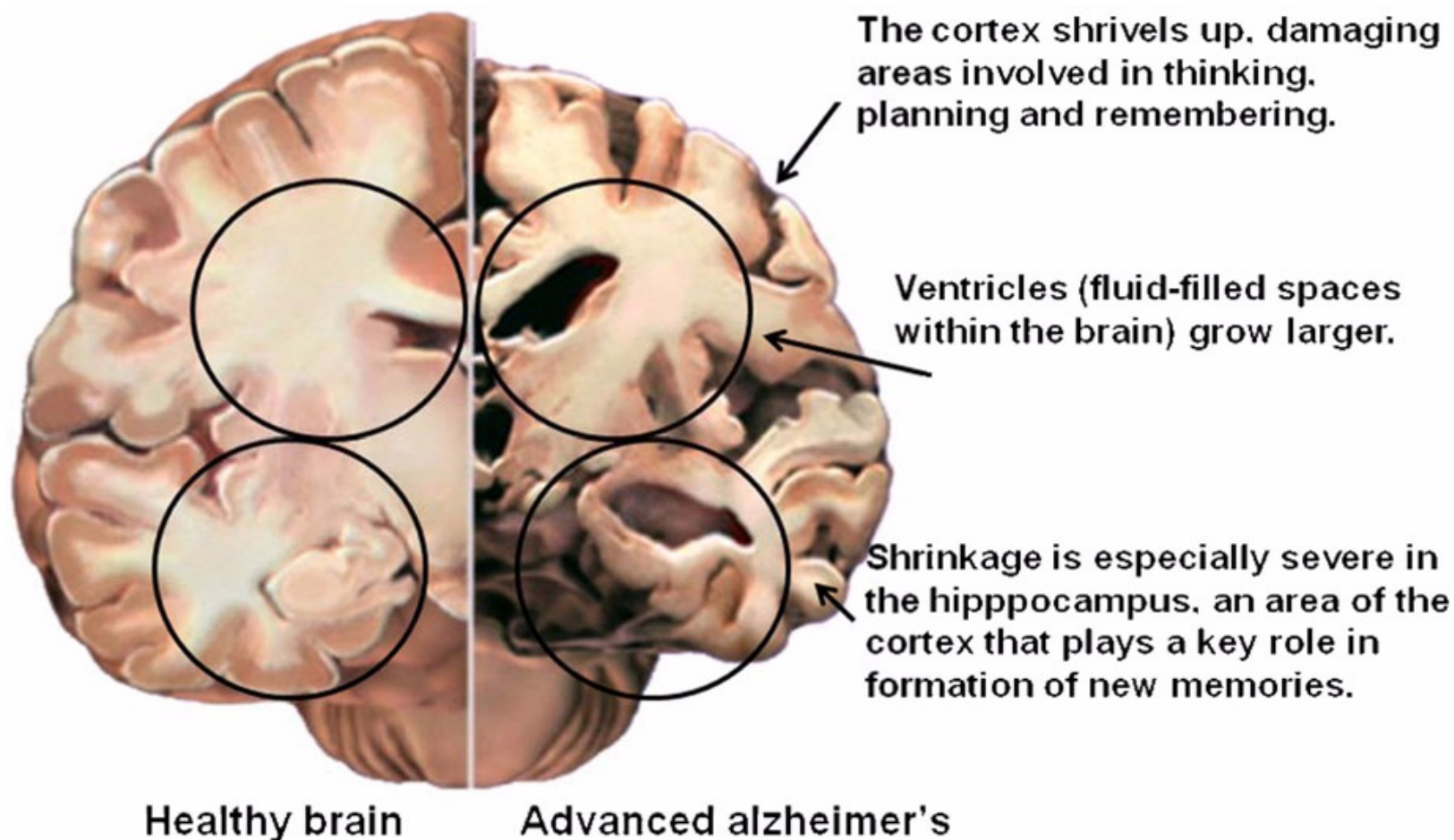
Overlege, geriatrisk avd. OUS, Ullevål



# Forekomst av de ulike demensformene hos eldre

- Alzheimers demens 60-70%
- Vaskulær demens 20-25%
- Lewy legeme demens / Parkinson demens
- Frontotemporallappsdemens
- Andre

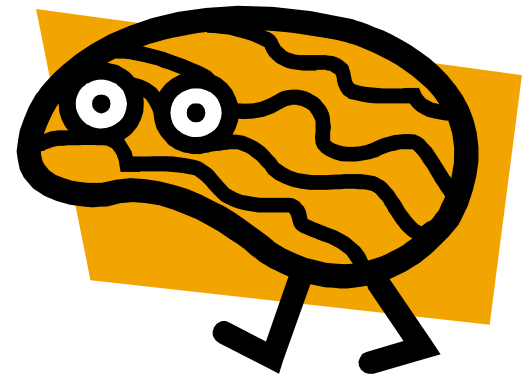
# Skjematisk fremstilling av celletap ved Alzheimer



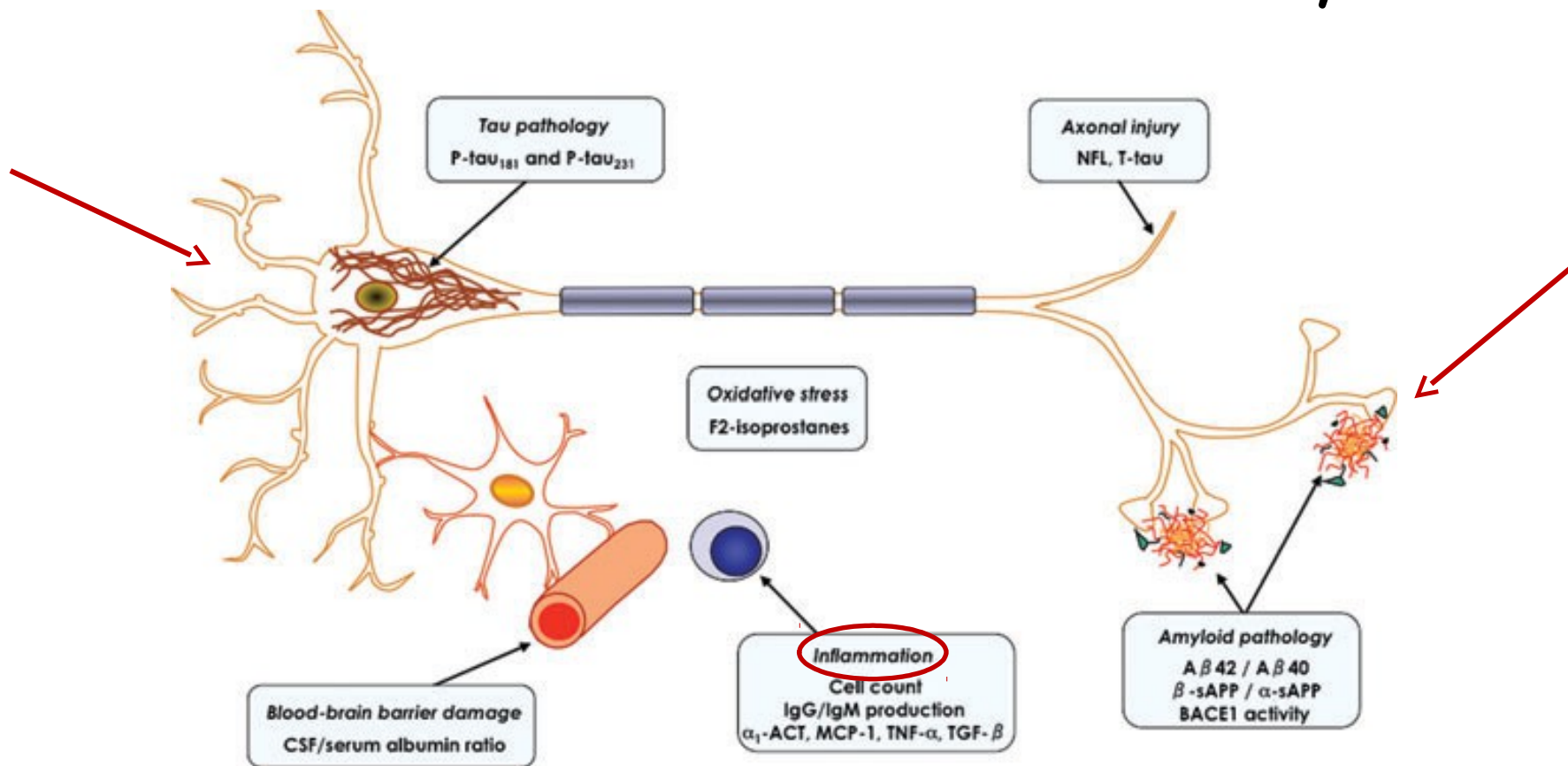
Lee Y.-J. et al. Arch Pharm Res. 2010

# Patogenesen ved Alzheimers sykdom

- Amyloide plakk
- Nevrofibrillær degenerasjon
- Nevroinflammasjon



# CSF biomarkører ved Alzheimers sykdom



Mattsson N. Annals of the New York Academy of Sciences. 2009

# Markører i spinalvæske ved demens

**Table 2** Summary of CSF biomarkers by diagnostic group as compared to patients with SMC<sup>a</sup>

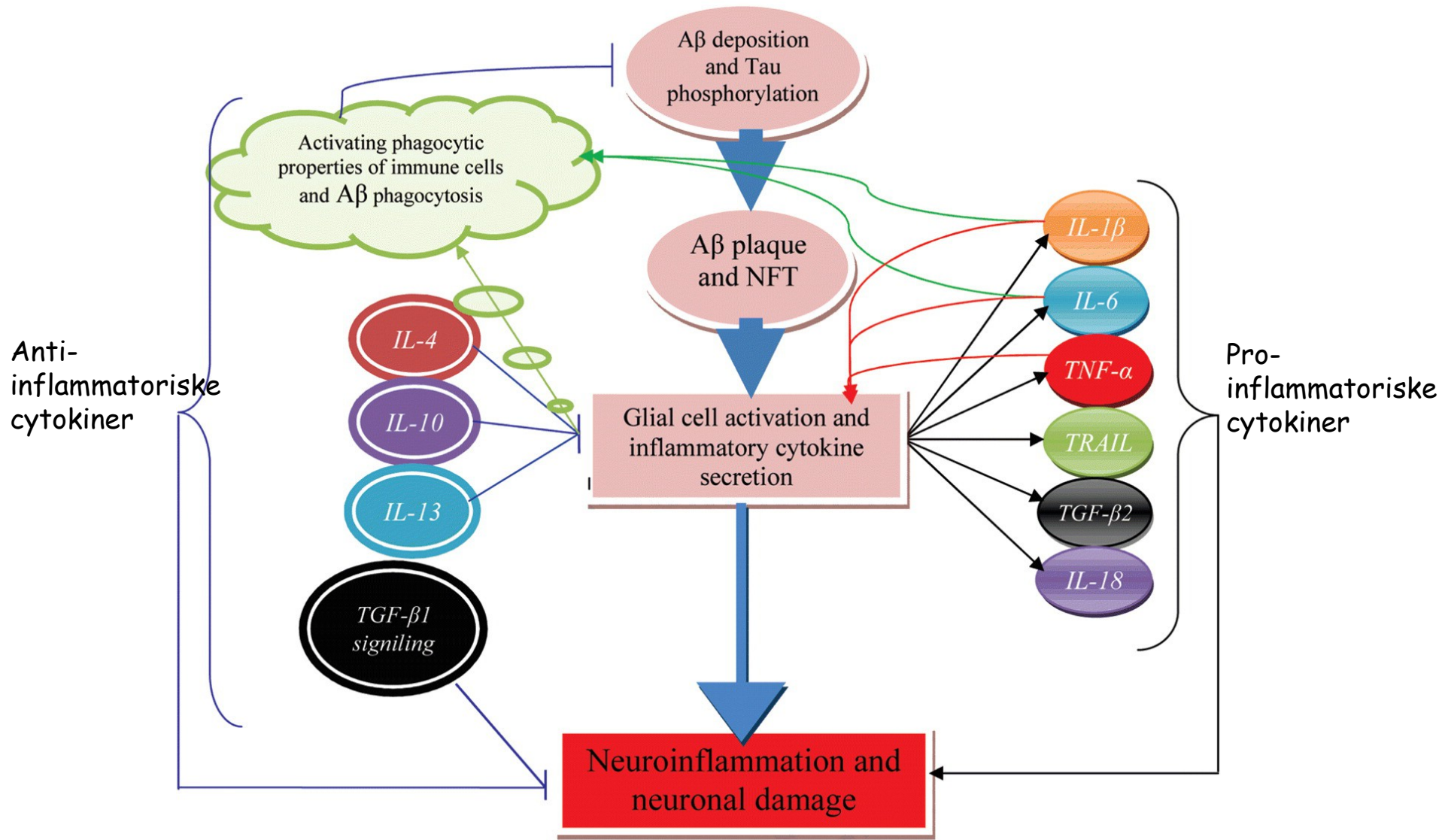
	A $\beta$ 42	Tau	p-tau
SMC	Ref	Ref	Ref
AD	↓↓	↑↑	↑↑
FTLD	↓	↑	-
DLB	↓	↑	↑
VAD	↓	-	-
CBD	↓	-	-
CJD	-	↑↑↑	↑
PSP	-	-	-
PSY	-	-	-

Abbreviations: A $\beta$ 42 = amyloid  $\beta$  42; AD = Alzheimer disease; CBD = corticobasal degeneration; CJD = Creutzfeldt-Jakob disease; DLB = dementia with Lewy bodies; FTLD = fronto-temporal lobar degeneration; p-tau = phosphorylated tau; PSP = progressive supranuclear palsy; PSY = psychiatric disorder; SMC = subjective memory complaints; VaD = vascular dementia.

<sup>a</sup> ↓ ↓, Strongly decreased, compared to SMC and patients with other types of dementia (OD); ↑ ↑, strongly increased, compared to SMC and OD; ↓, decreased compared to SMC; ↑, increased compared to SMC; =, comparable with SMC; ↑ ↑ ↑, extremely increased, compared to all other groups.

Schoonenboom NSM. Neurology 2012





Azizi G. Immunopharmacology and Immunotoxicology. 2012

# Cytokiner assosiert med AD

- Pro-inflammatoriske cytokiner
  - ↑ Interleukin-1 $\beta$  (IL-1 $\beta$ )
  - ↑ Interleukin-6 (IL-6)
  - ↑ Tumor nekrose faktor- $\alpha$  (TNF $\alpha$ )
  - ↑ Interferon- $\gamma$  (IF- $\gamma$ )
- Anti-inflammatoriske cytokiner
  - ↓ Interleukin-4 (IL-4)
  - ↓ Interleukin-10 (IL-10)





Contents lists available at ScienceDirect

## Immunology Letters

journal homepage: [www.elsevier.com/locate/](http://www.elsevier.com/locate/)

# Differences of peripheral inflammatory markers between mild cognitive impairment and Alzheimer's disease

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# IL-6 (45 AD, 34 MCI patients and 28 Controls)

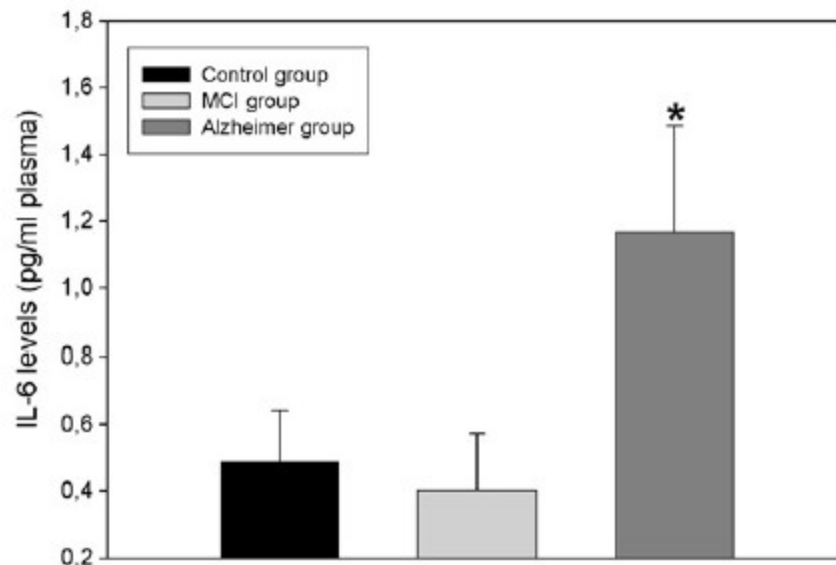


Fig. 1. Plasma levels of IL-6 cytokine (pg/ml) from Control, MCI and Alzheimer's patients. Results are expressed as mean  $\pm$  S.E.M. \*Differences statistically significant between MCI and Alzheimer group ( $p < 0.05$ , Duncan's test).

Bermejo et al. Immunology Letters 2008.

# TNF- $\alpha$

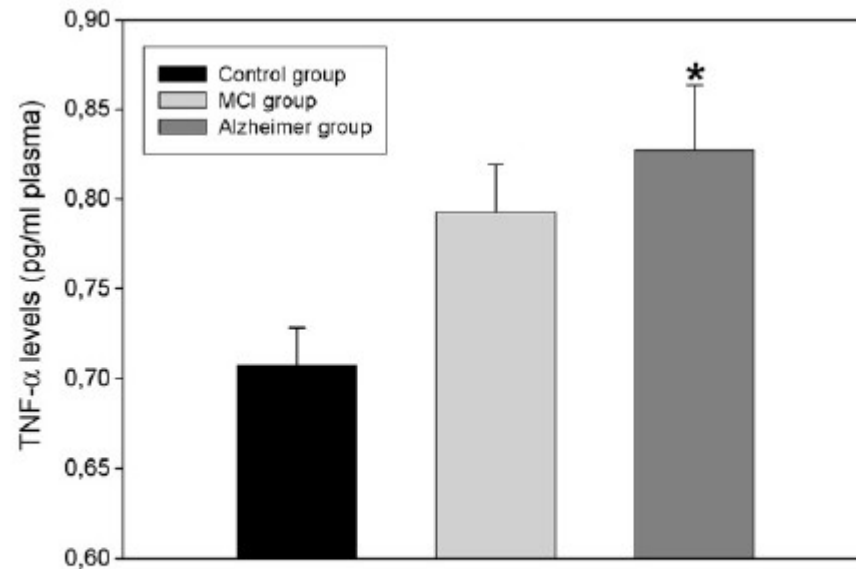


Fig. 2. Plasma levels of TNF- $\alpha$  cytokine (pg/ml) from Control, MCI and Alzheimer's patients. Results are expressed as mean  $\pm$  S.E.M. \*Differences statistically significant between Alzheimer and control group ( $p < 0.05$ , Duncan's test).

Bermejo et al. Immunology Letters 2008.

# Inflammasjon ved depresjon og demens/AD

	Depresjon	Demens/AD
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## Pro-inflammatoriske cytokiner

IL-1	+	+
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IL-6	+	+
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TNF- alpha	+	+
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IFN	+	+
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## Anti-inflammatoriske cytokiner

IL-4	-	-
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IL-10	-	-
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Leonard B. Neurochem Res. 2007.

# Konklusjon

- Patogenesen er komplisert ved Alzheimers sykdom
  - Amyloide plakk
  - Nevrofibrillær degenerasjon
  - Nevroinflammasjon