

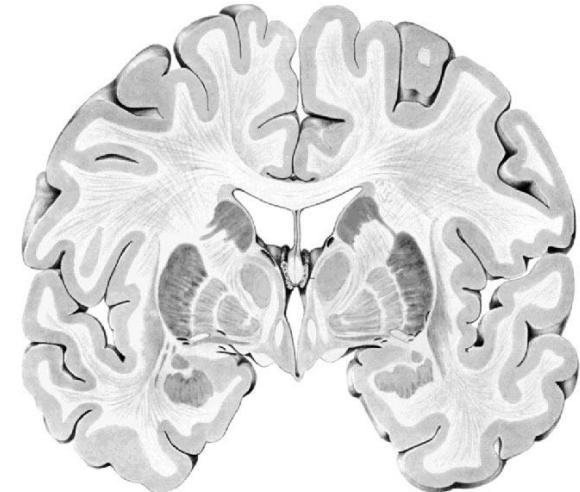
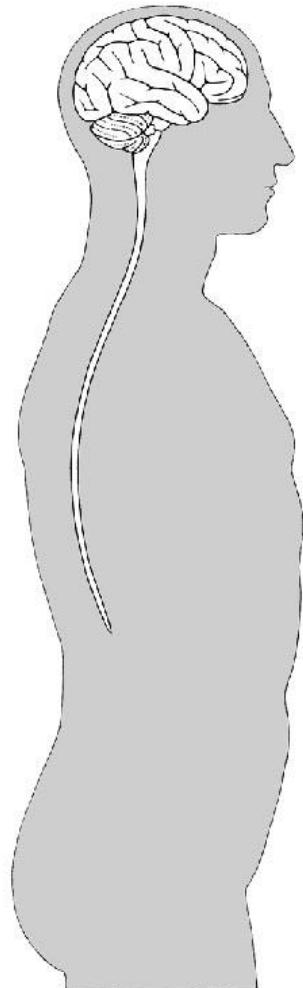
Neurosensorik und Neurodegeneration
„Neue Erkenntnisse von Fetten, Sinnen und dem Zelltod“

NWG
Neurowissenschaften in der gymnasialen Oberstufe
2018-2019

Feind oder Freund? Lipide und die Mechanismen der Neurodegeneration

Anja U. Bräuer
Oldenburg, 14.02.2019

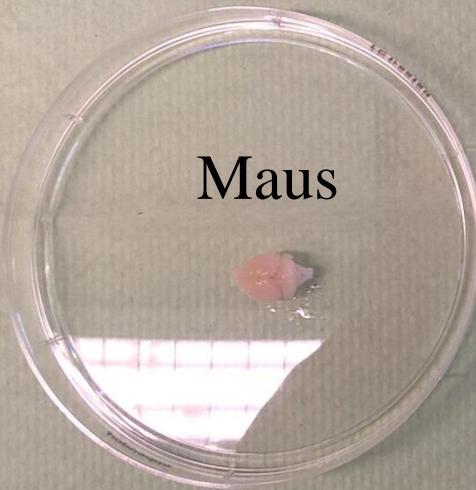
Das zentrale Nervensystem



Das menschliche Gehirn

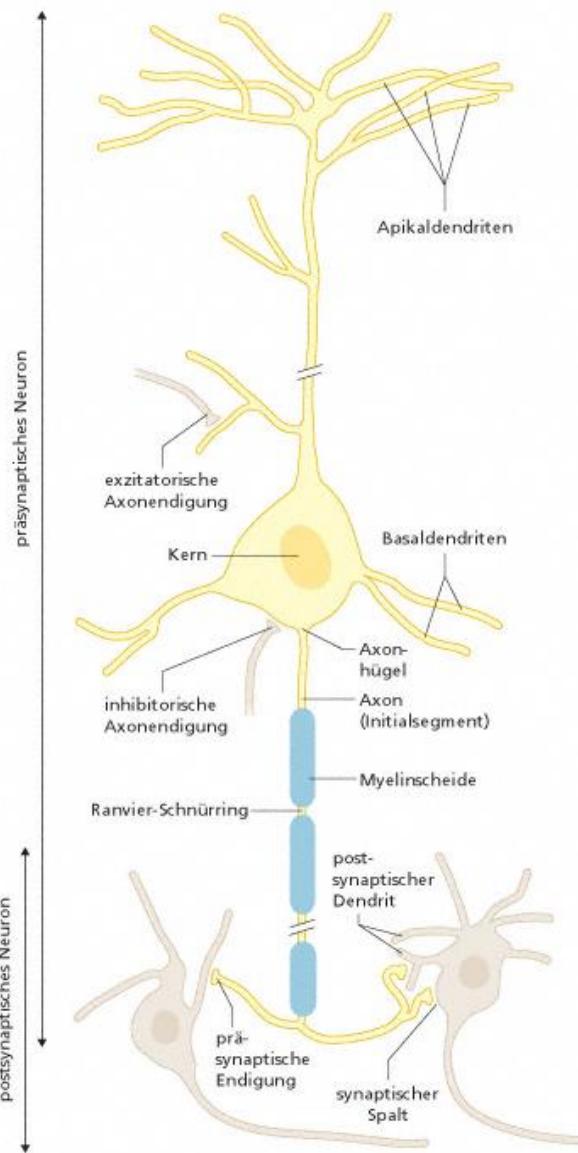


Maus

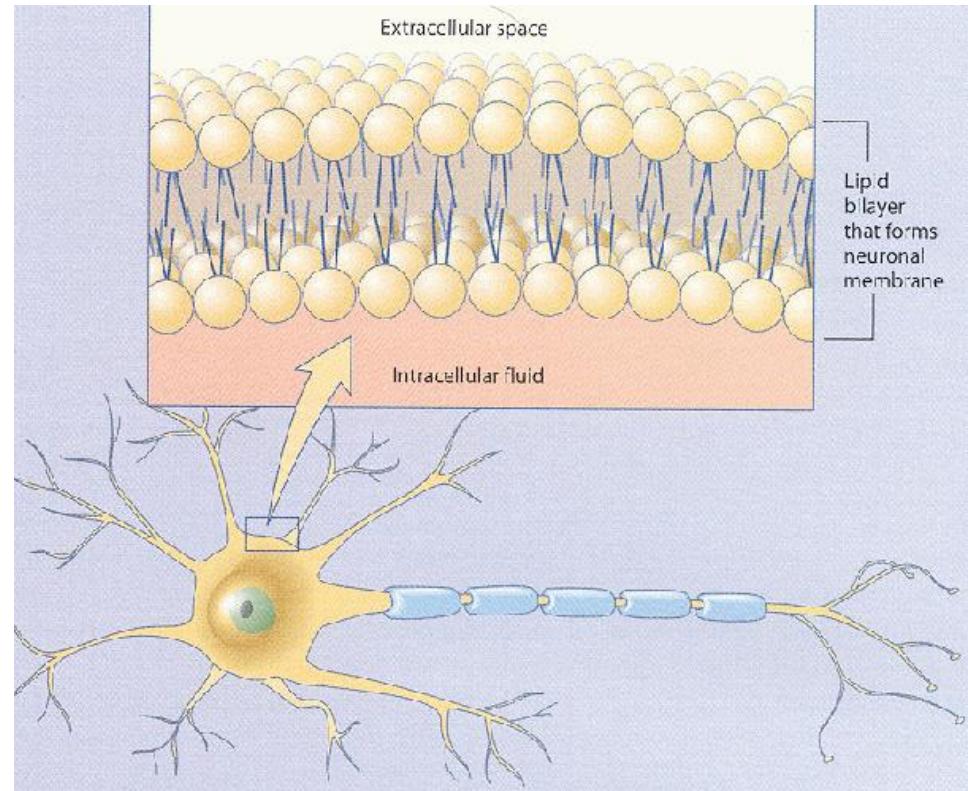


Mensch



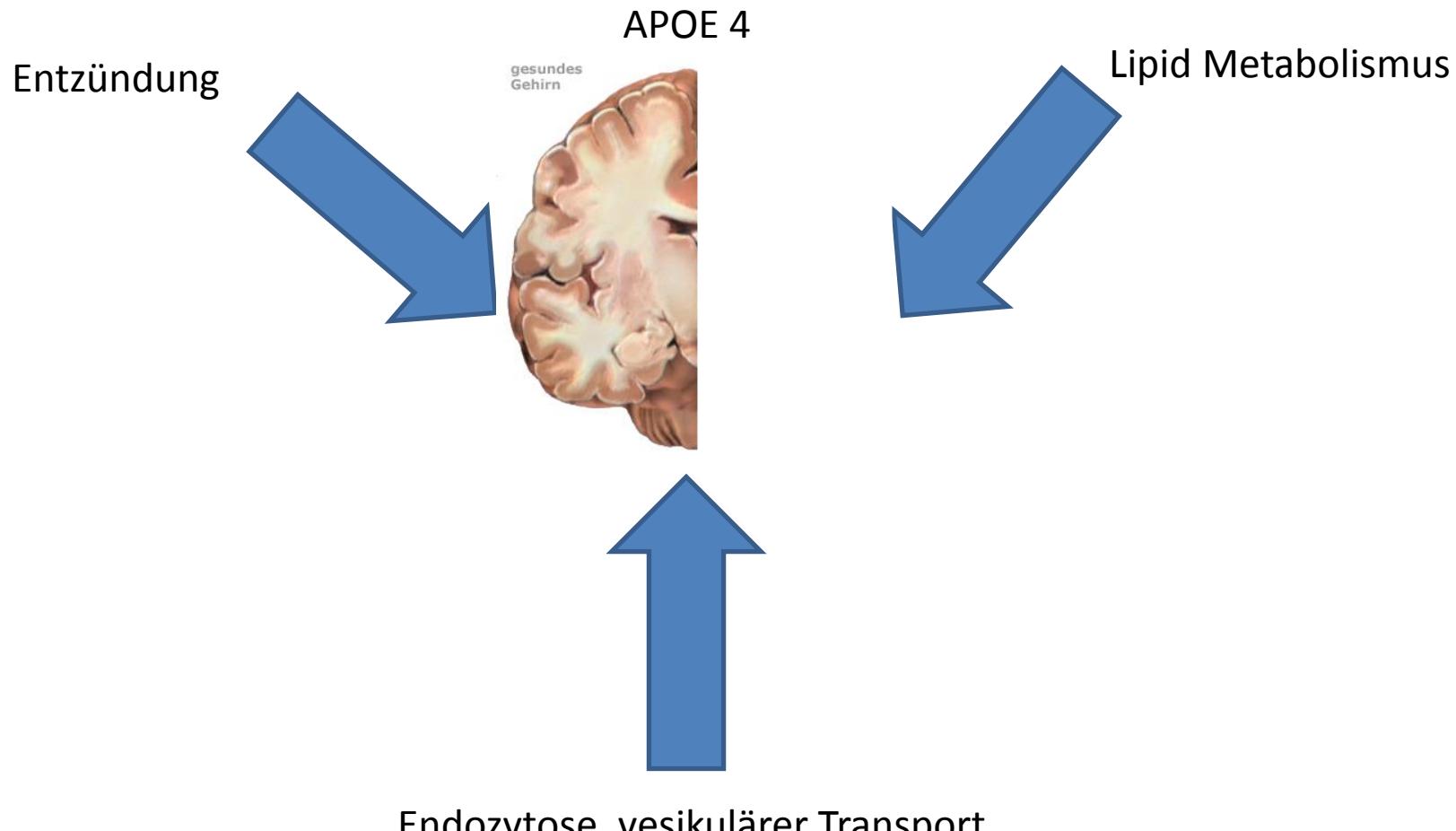


10^{12} (Billion) Neurone
 10^{15} (Billarde) Synapsen

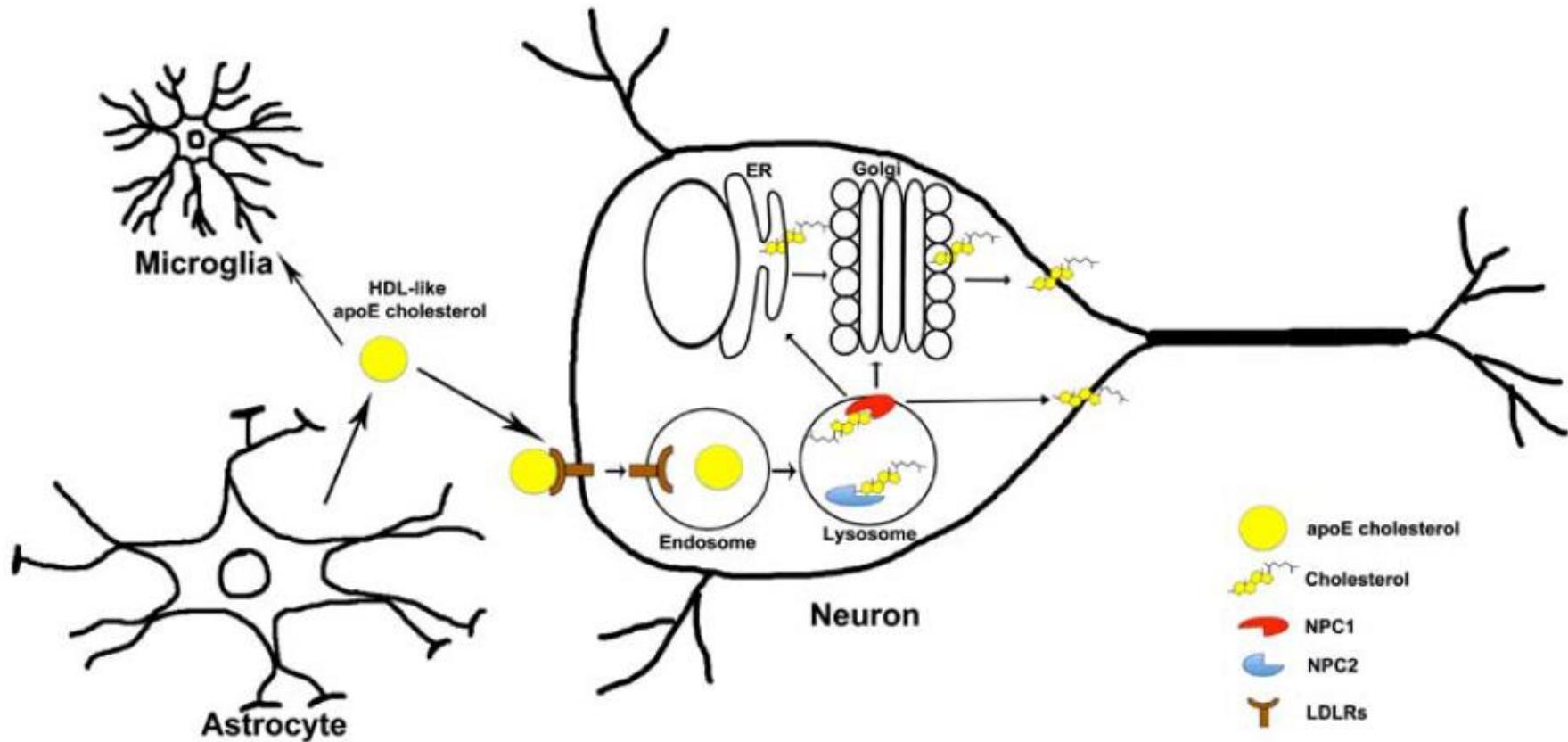


10.000 bis 100.000 Synapsen können sich auf der Oberfläche einer einzigen Nervenzelle befinden

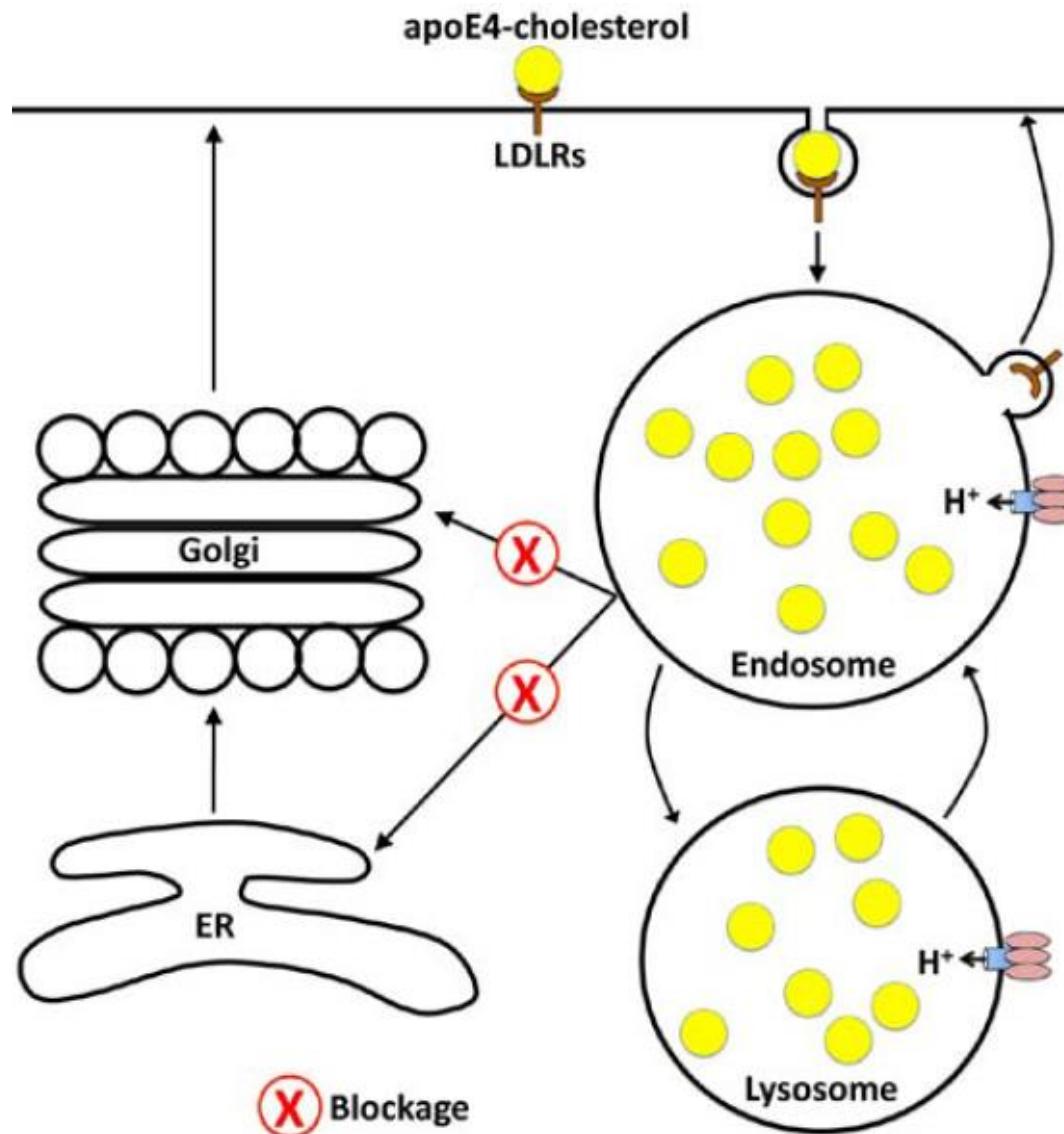
Risiko



„gechilltes Cholesterol“



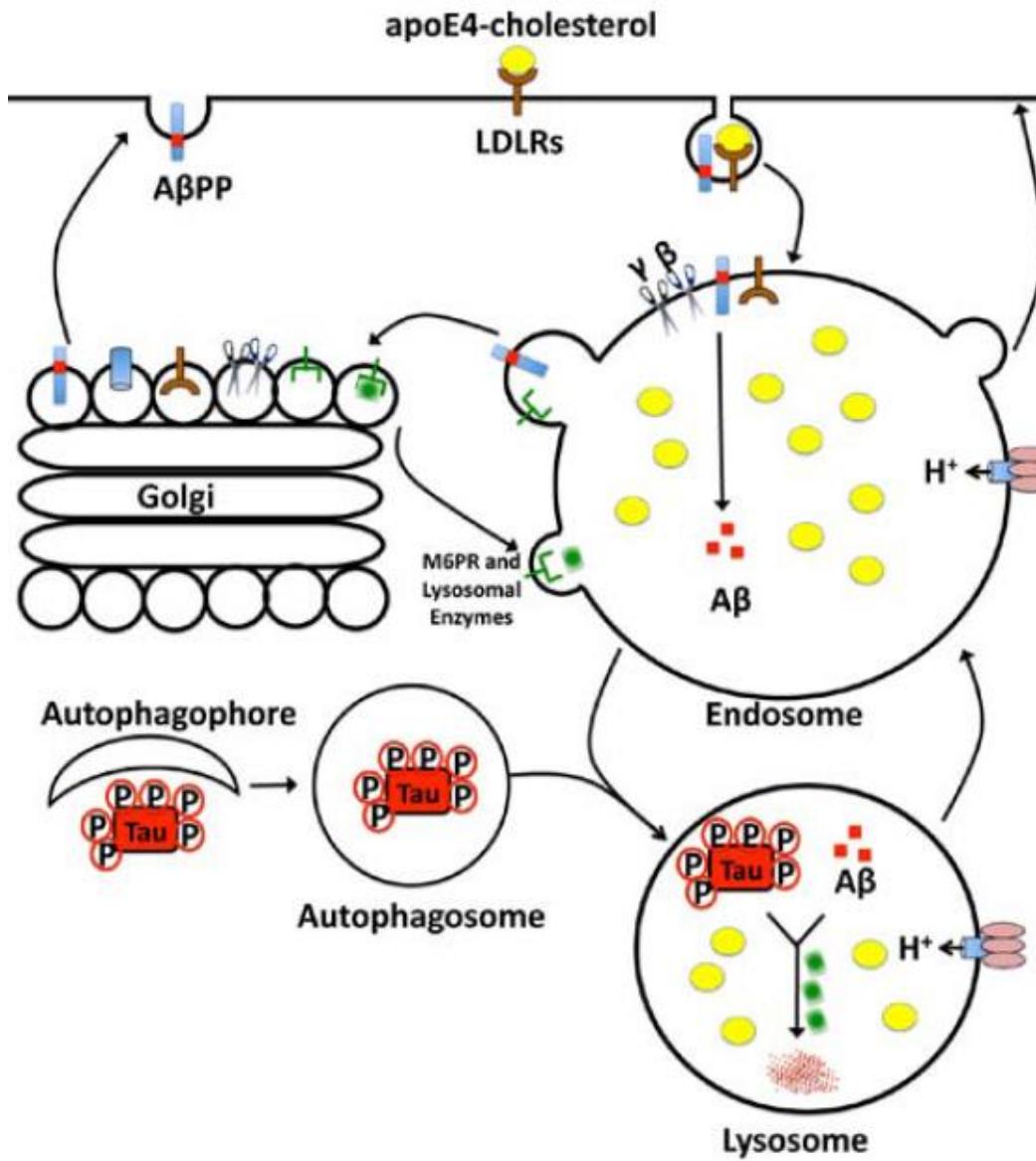
HDL = High Density Lipoprotein
NPC = Niemann-Pick type C



ER = endoplasmatic reticulum

LDLRs = Low-density lipoprotein receptors

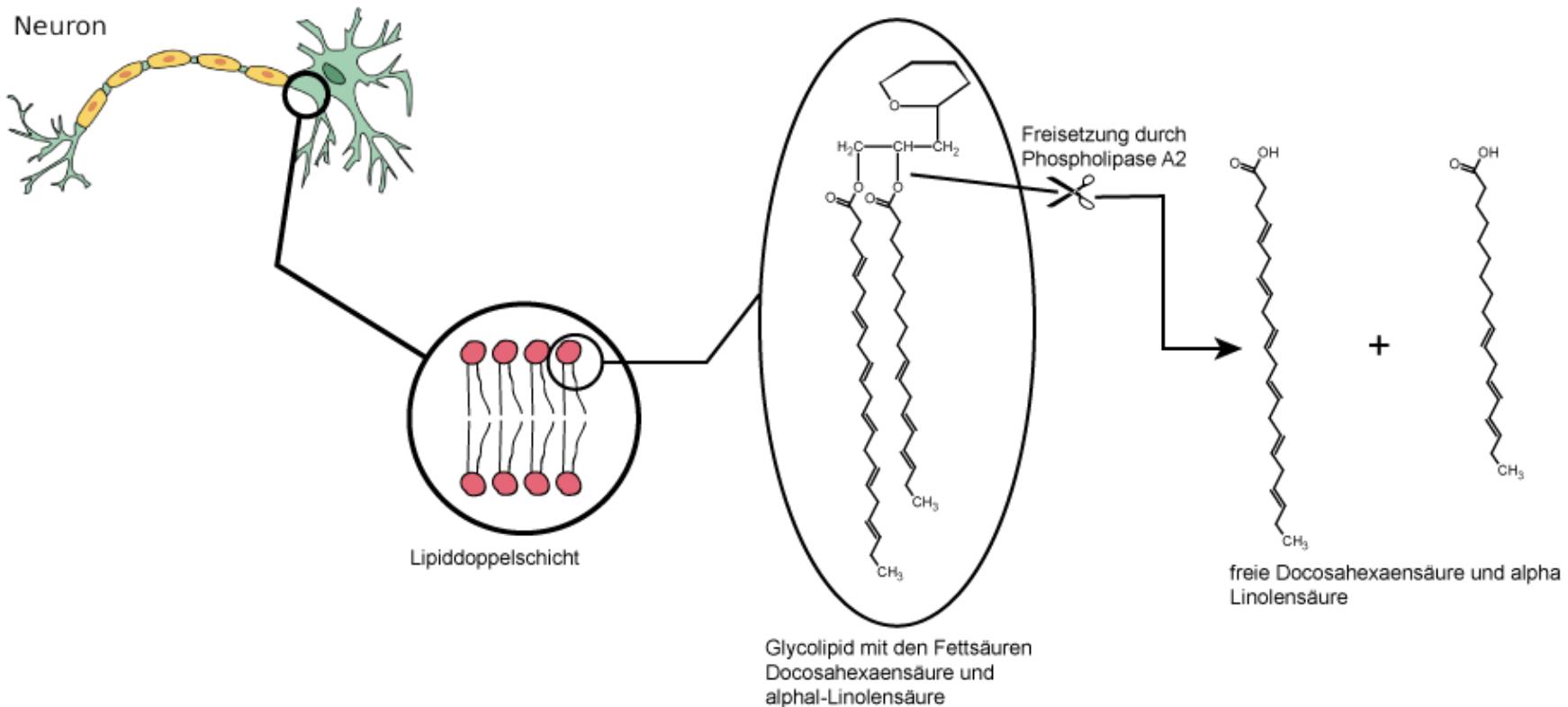
Cholesterol aus der Balance



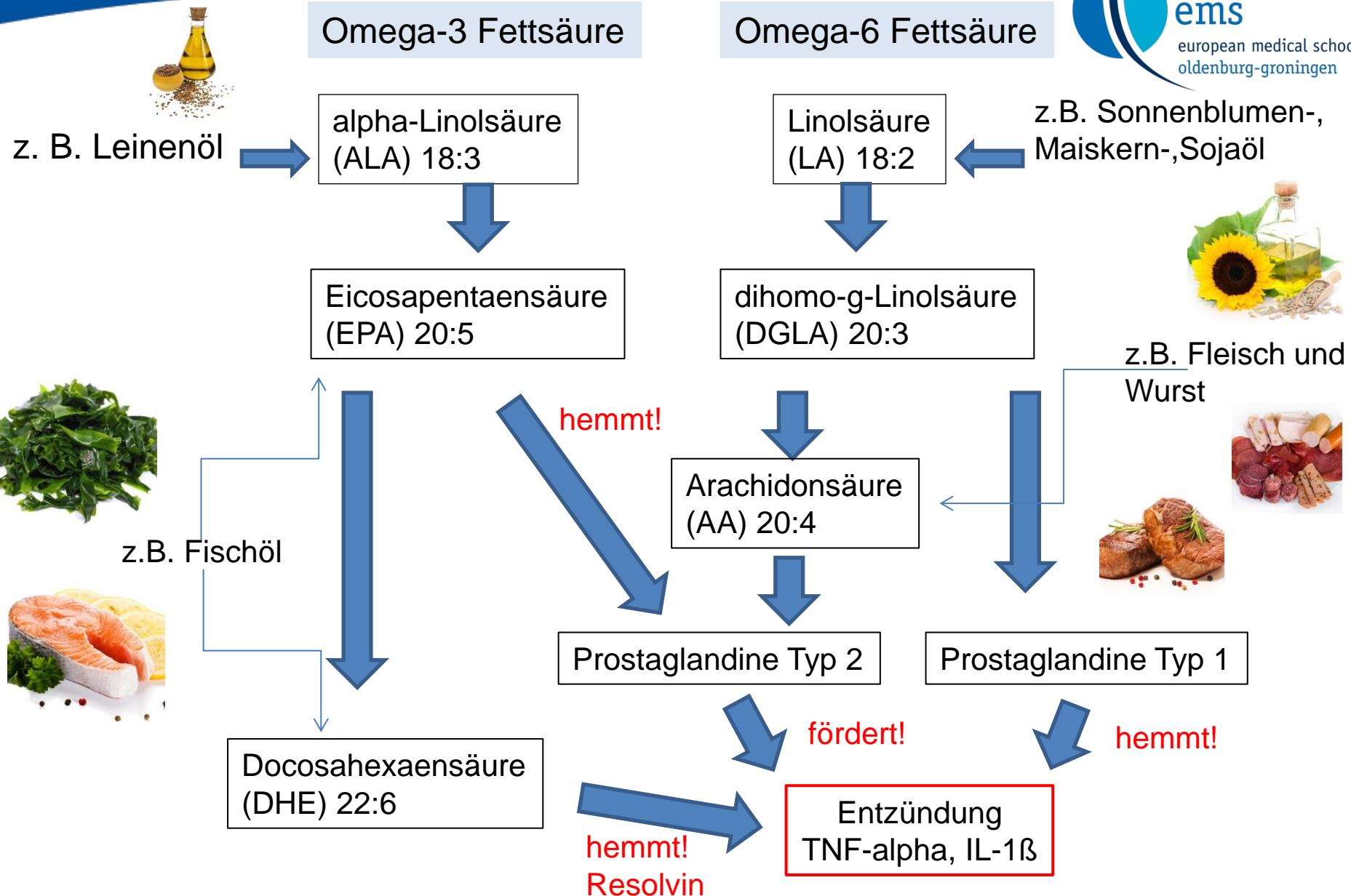
A β PP = amyloid β protein precursor

Chen et al., J Parkinsons Dis Alzheimer Dis, 2014

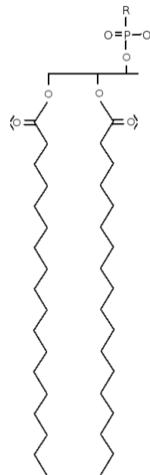
Ω-3 Fettsäuren als integraler Bestandteil neuronaler Membranen



Ölwechsel erforderlich?



Plasmalogene



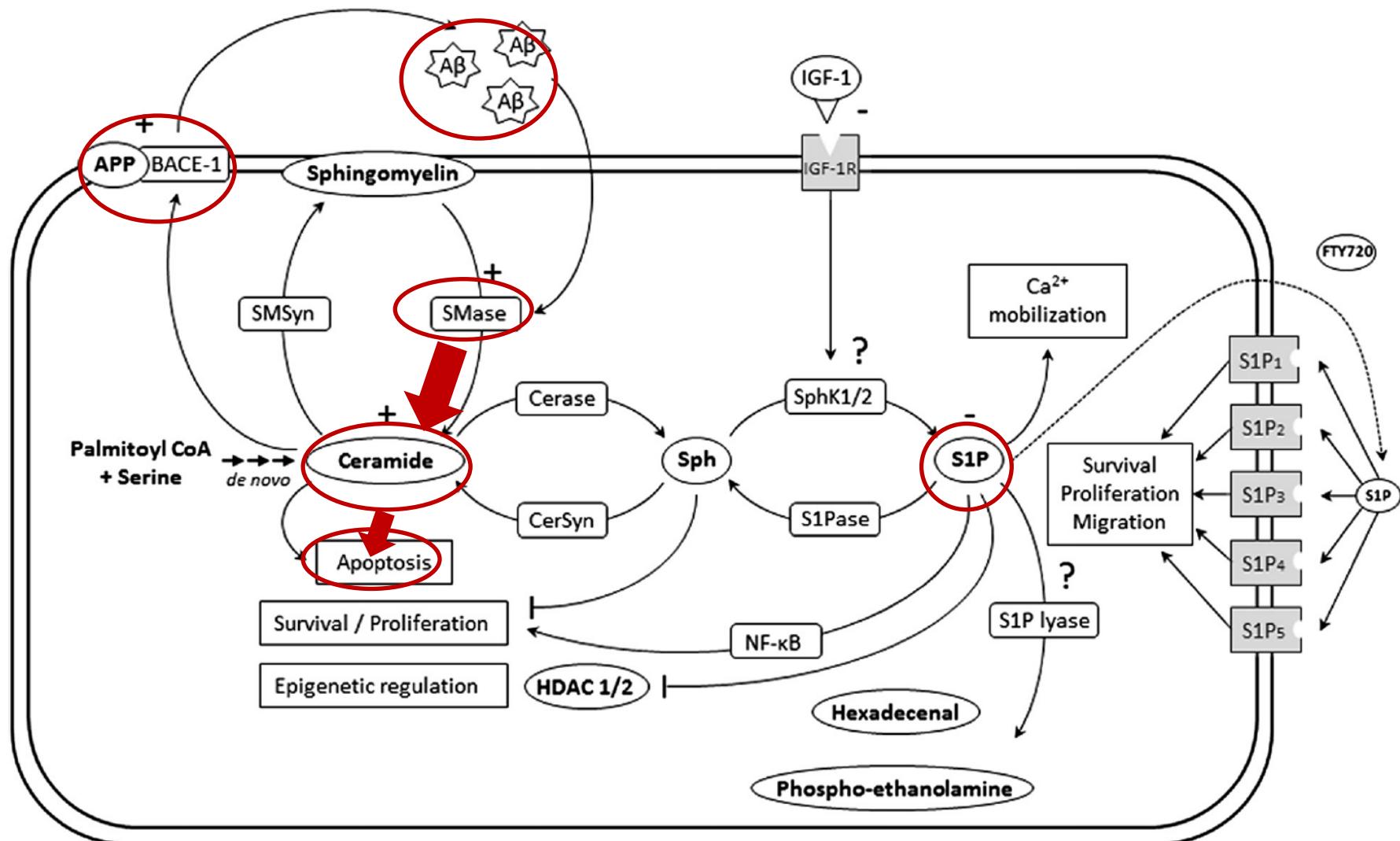
Cow Breast

Sources of
Plasmalogens

	Scallop	Chicken
	Plasmalogen	Plasmalogen
EPA	23.9%	-
DHA	38.9%	18.6%

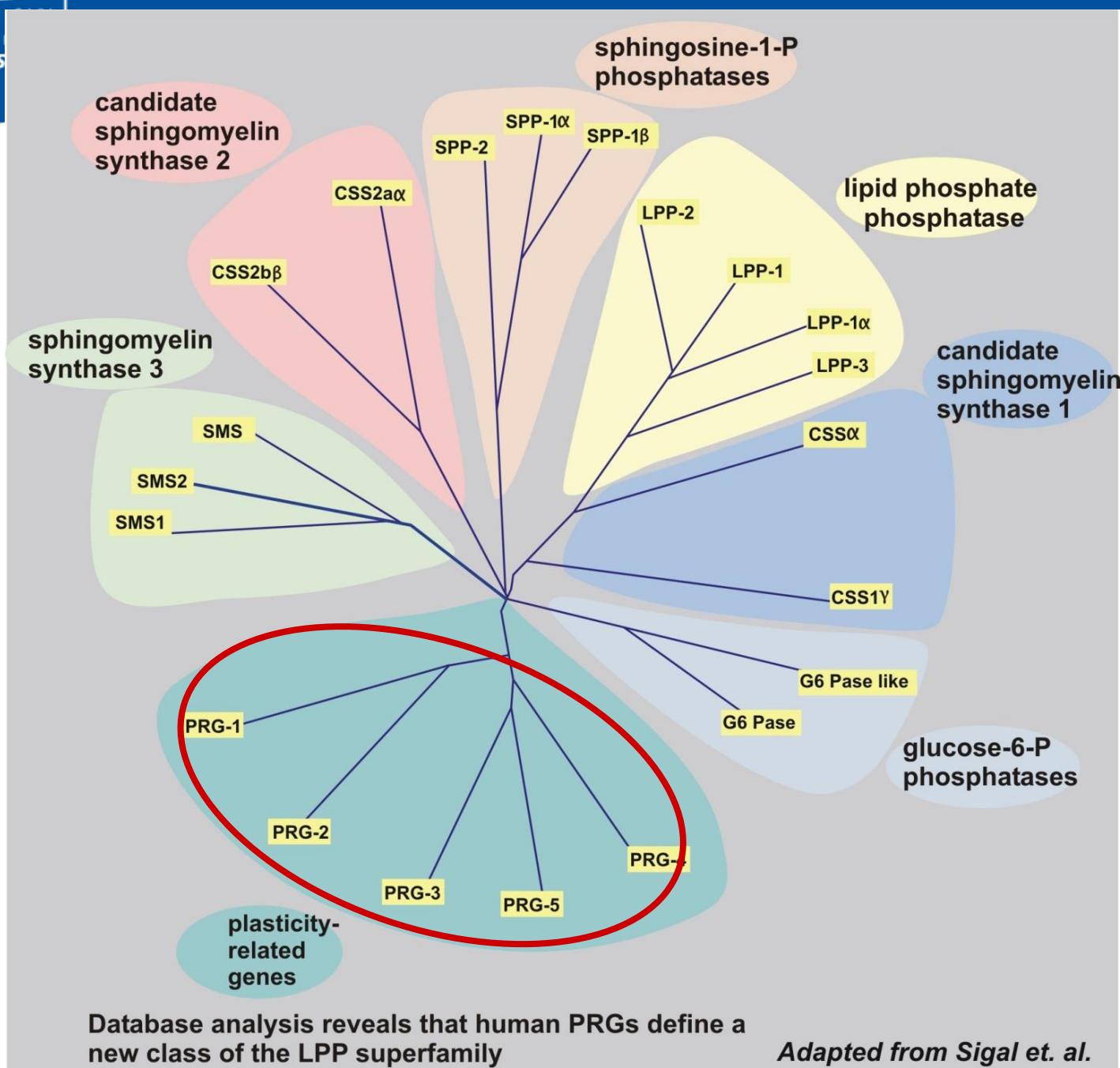


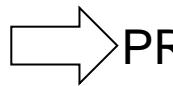
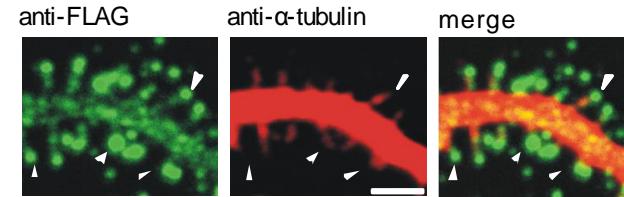
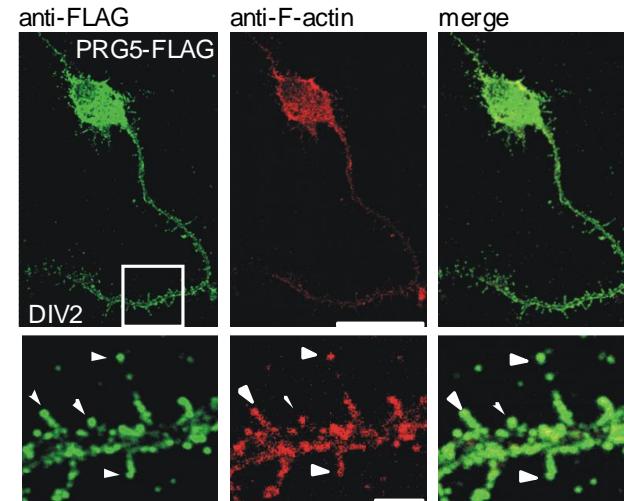
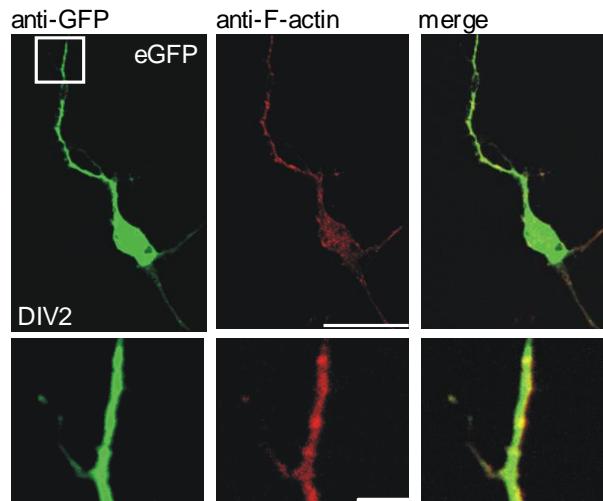
Rich in polyunsaturated fatty acids and is IDEAL



SMSyn, sphingomyelin synthase; SMase, sphingomyelinase; Cerase, ceramidase; CerSyn, ceramide synthase; Sph, sphingosine; SphK1/2, sphingosine kinase 1/2; S1Pase, sphingosine 1-phosphate phosphatase

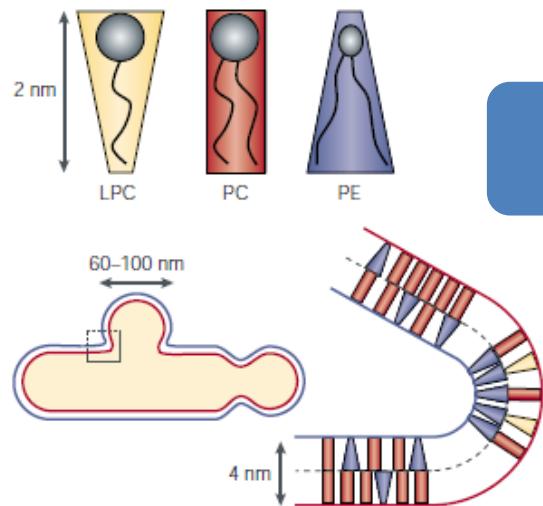
Ceccom et al., Acta Neuropathologica Communications, 2014



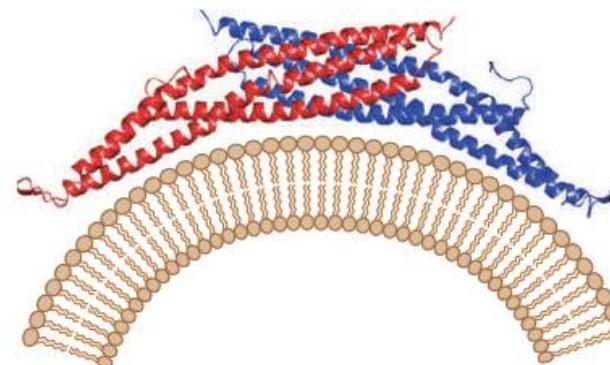


PRG5 induces spine-like structures in immature neurons

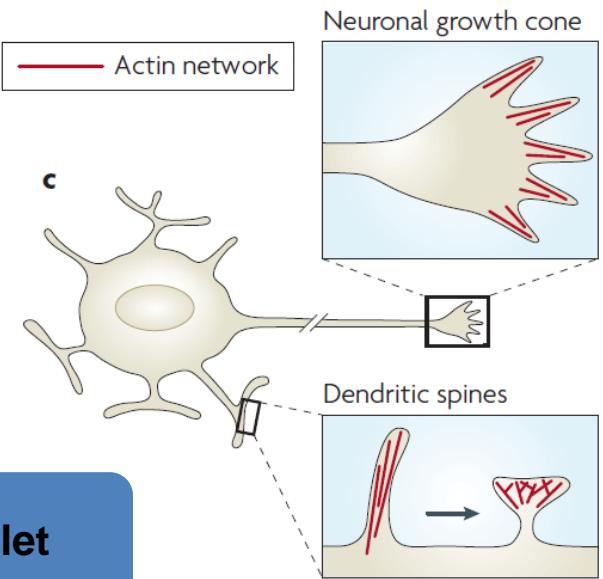
Wie kommt es zu einer Membrankrümmung?



Lipid
Komposition

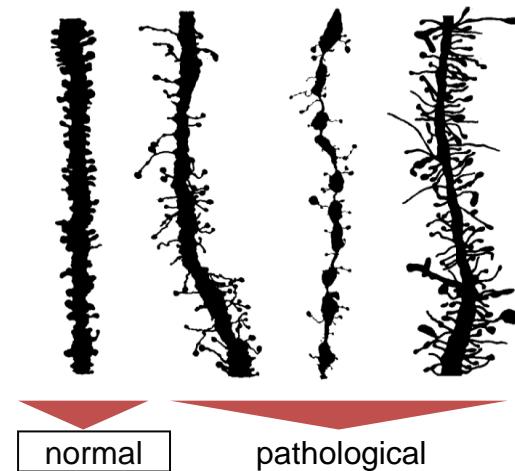
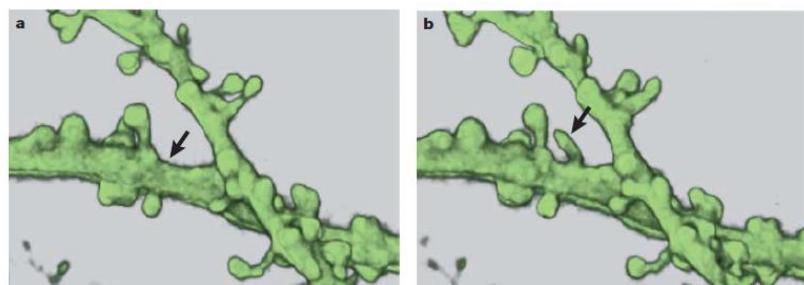
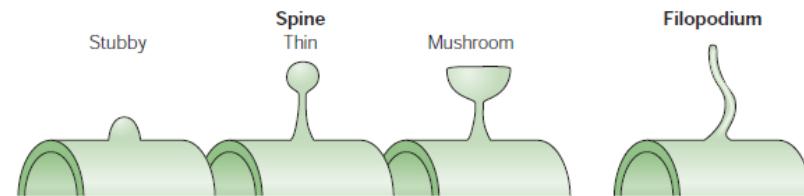


Zytoskelet

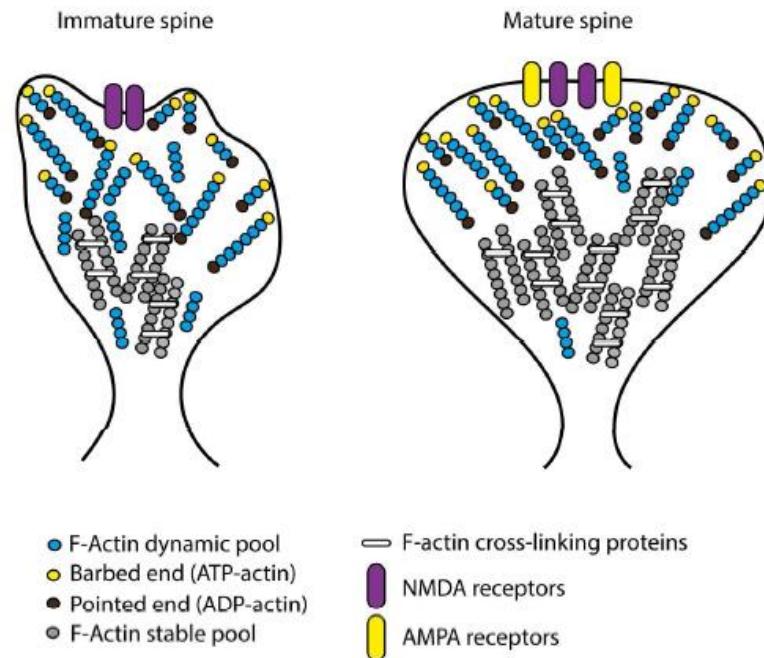


Scaffolding
Proteine

Dendritic Spine Development



Fiala et al., *Brain Research Reviews*, 2002



Hlushchenko et al., *Cytoskeleton*, 2016



Forschungsabteilung Anatomie



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MD student



Yaoyu Chen,
PhD student

**Vielen Dank für ihre Aufmerksamkeit
und weiterhin Guten Appetit!**

