

1

Acyl chain Platform Polar Head Group

Fatty acid

Glycerol

Sphingosine

PO₄

Alcohol

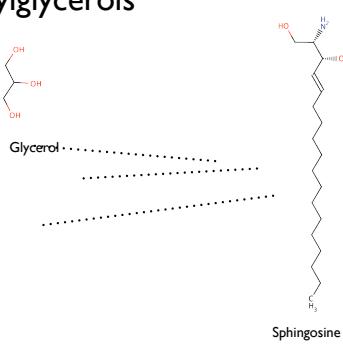
Choline

Sugar

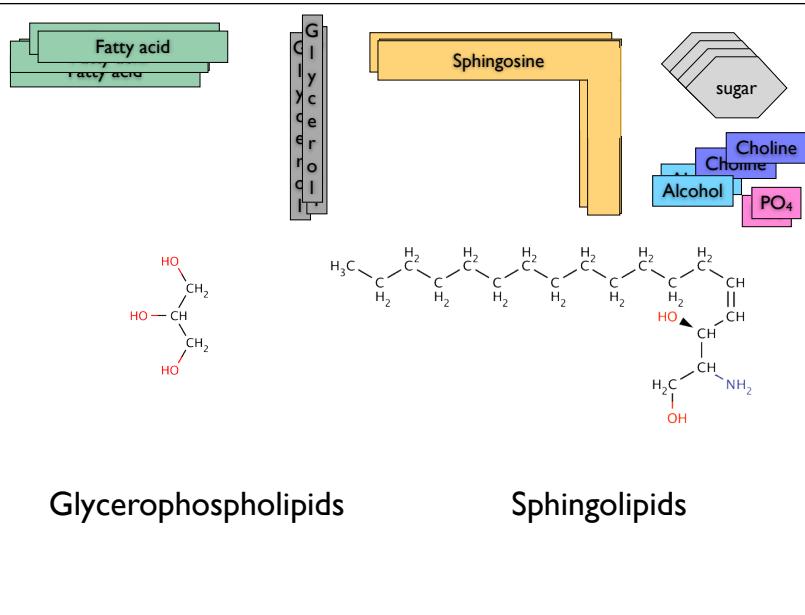
2

phospholipids
and
triacylglycerols

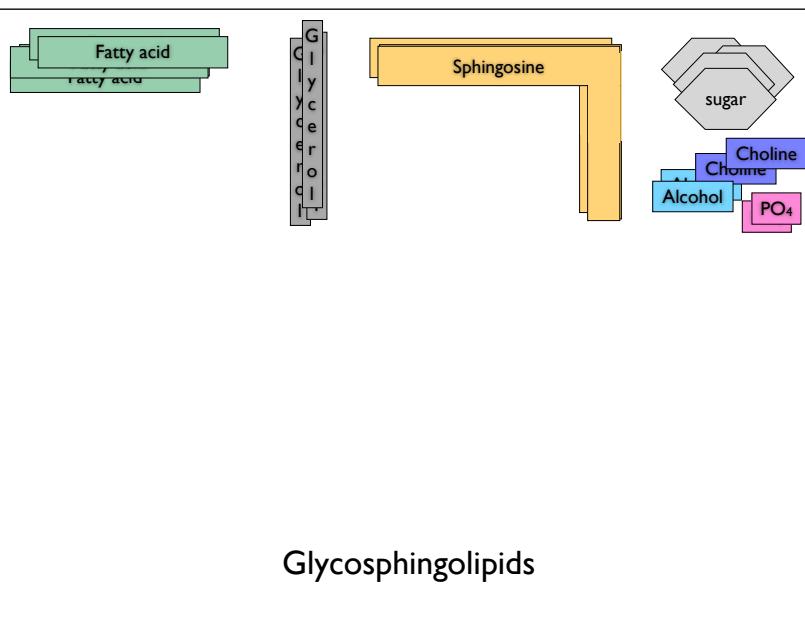
Sphingolipids



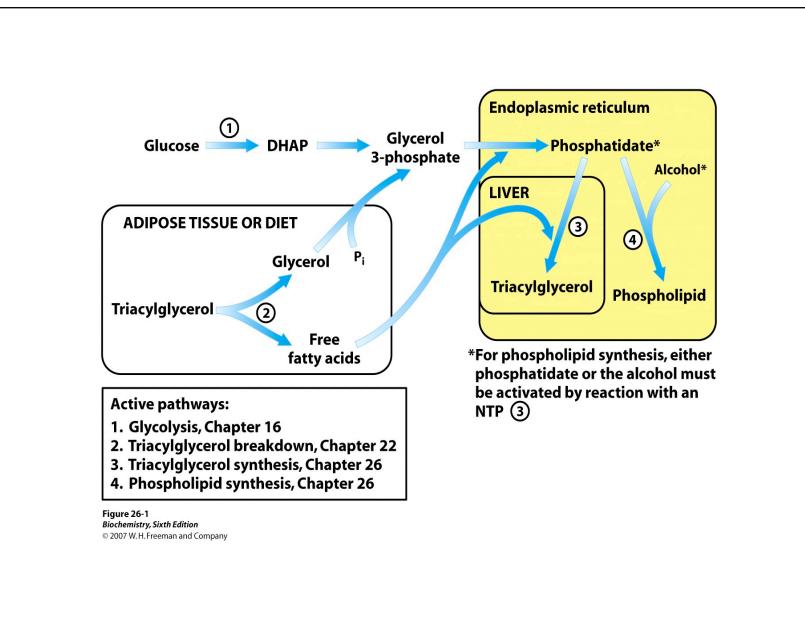
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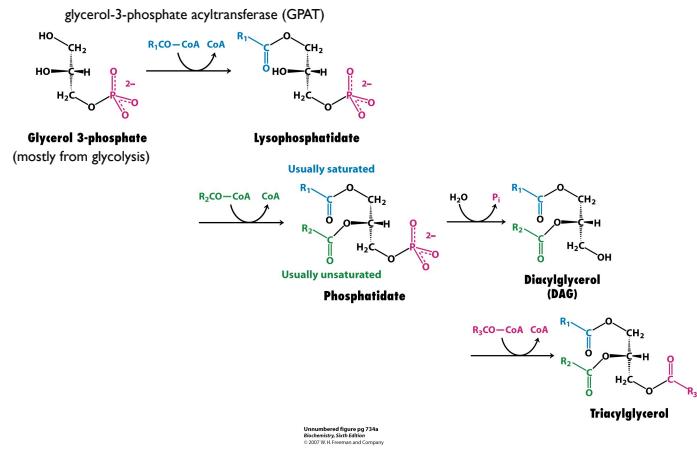
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5

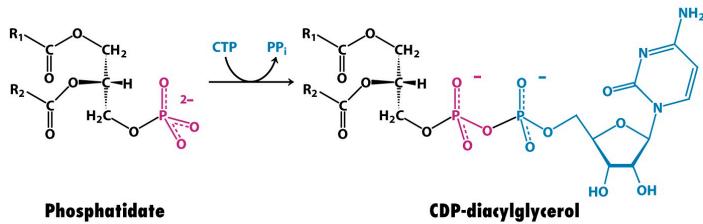


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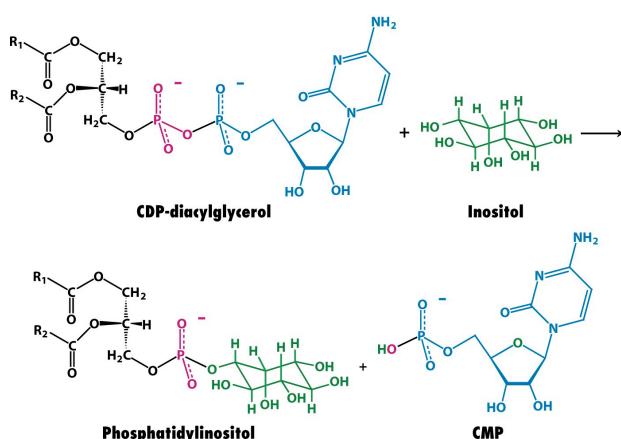


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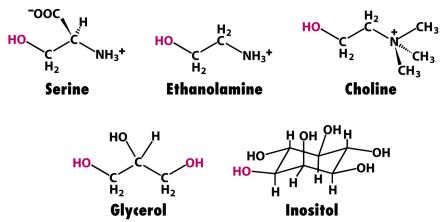
Key committed step in the synthesis of phospholipids



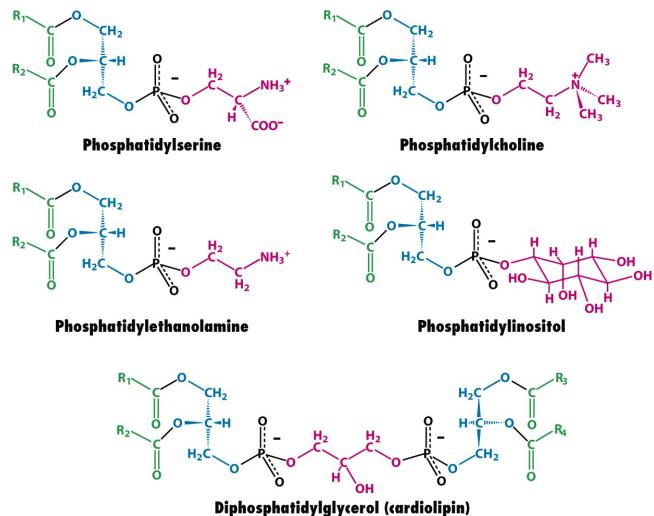
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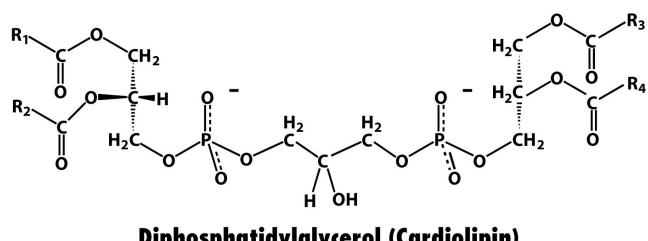
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10

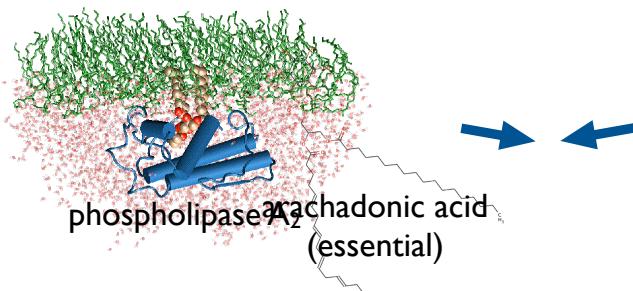


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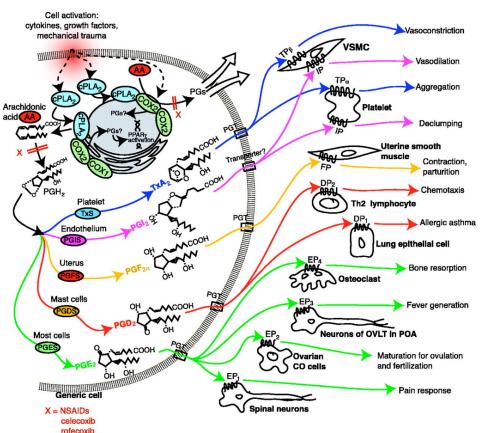
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Phosphatidylinositol is a key element of several cell signaling pathways



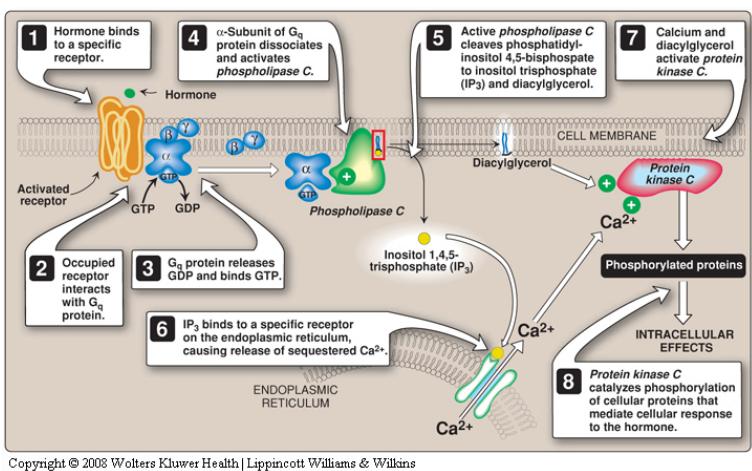
13

Phospholipase A₂ cleaves arachidonic acid from membrane lipids, resulting in signaling via eicosanoids



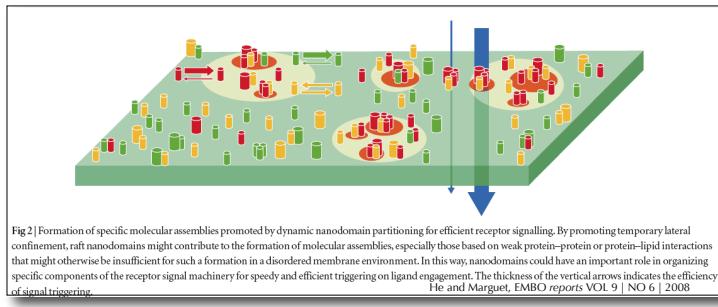
14

Phospholipase C cleaves phosphatidylinositol to release IP₃ and DAG

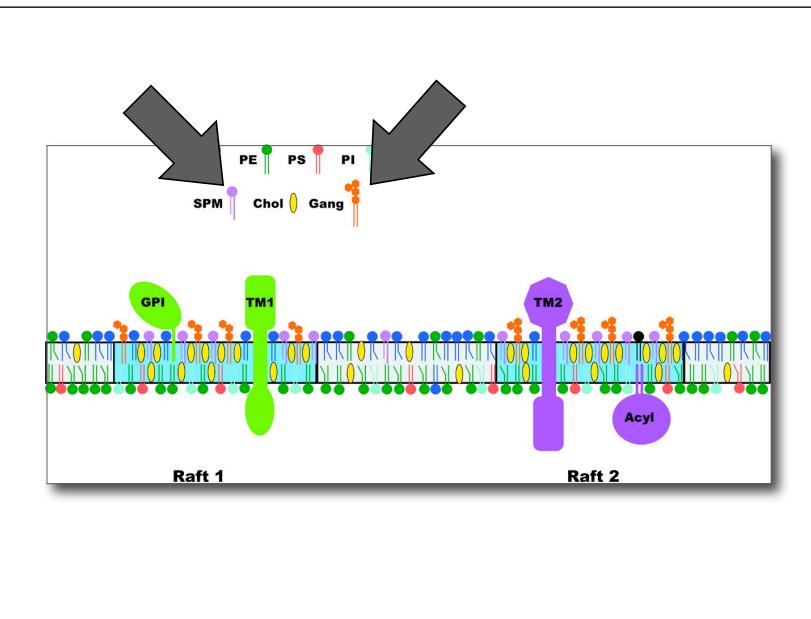


15

Lipid rafts are thought to promote molecular assemblies and to drive conformational changes in membrane proteins

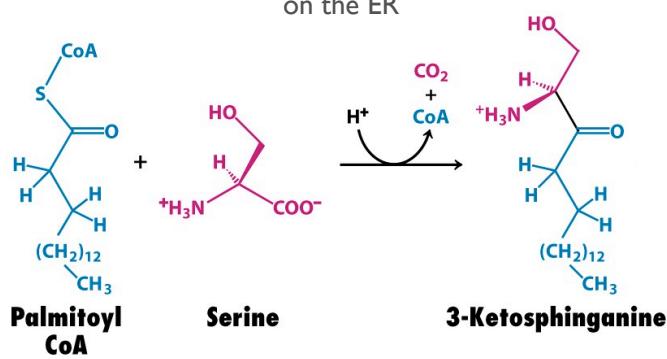


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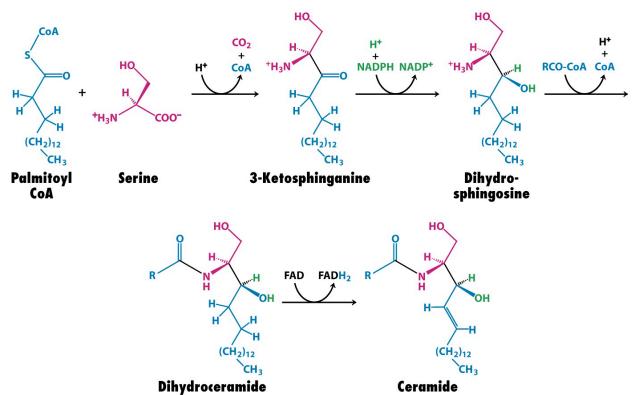


17

de novo synthesis of sphingolipids begins with the condensation of palmitoyl-CoA with serine by **serine palmitoyl transferase (pyridoxal phosphate)** on the ER



18



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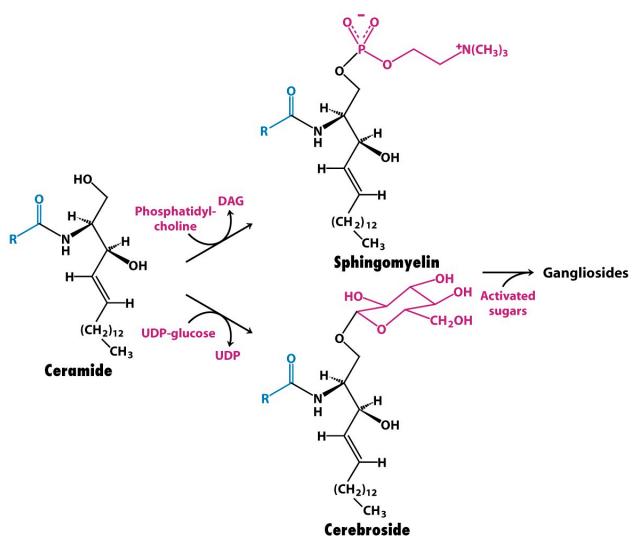


Figure 26-3
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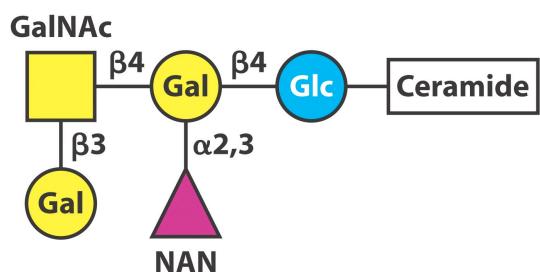
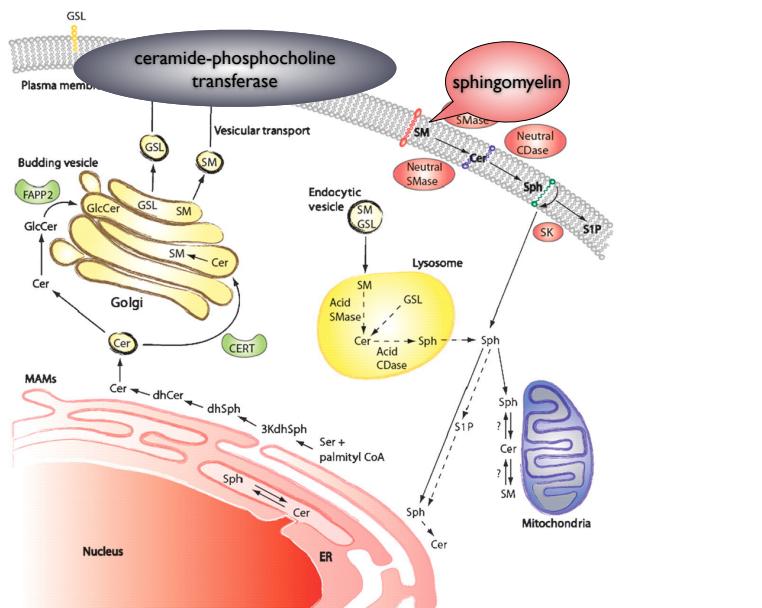


Figure 26-4
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- [Ceramide Induced Activation of Cytosolic NADH/Cytochrome C Electron Transport Pathway: An Additional Source of Energy for Apoptosis.](#)
 1. Gorgoglion V, Palmitessa V, Lofrumento DD, Piana GL, Abbrescia DI, Marzulli D, Lofrumento NE. *Arch Biochem Biophys*. 2010 Sep 15. [Epub ahead of print] PMID: 20850412 [PubMed - as supplied by publisher]

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- [Withanolide D induces apoptosis in leukemia by targeting the activation of neutral sphingomyelinase-ceramide cascade mediated by synergistic activation of c-Jun N-terminal kinase and p38 mitogen-activated protein kinase.](#)
 2. Mondal S, Mandal C, Sangwan R, Chandra S, Mandal C. *Mol Cancer*. 2010 Sep 13;9(1):239. [Epub ahead of print] PMID: 20836852 [PubMed - as supplied by publisher]

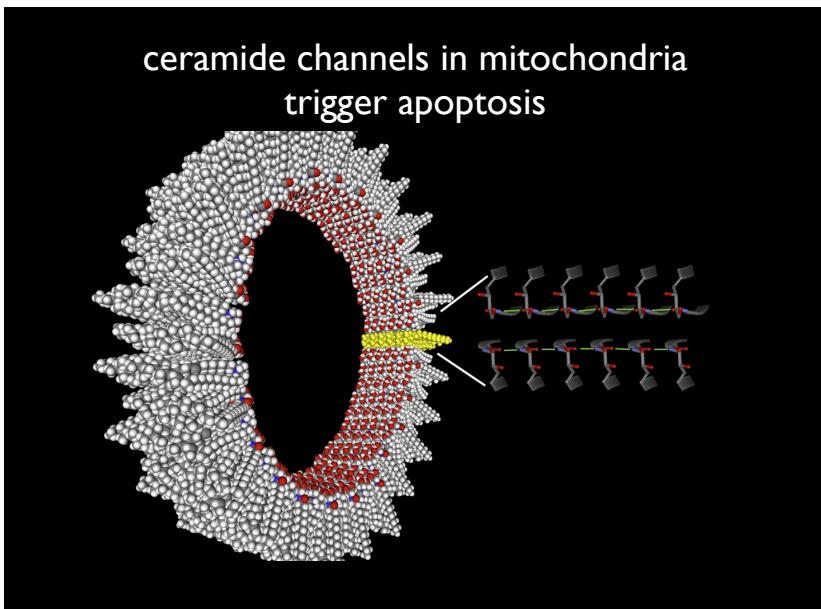
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 3. Ji C, Yang B, Yang YL, He SH, Miao DS, He L, Bi ZG. *Oncogene*. 2010 Aug 30. [Epub ahead of print] PMID: 20802518 [PubMed - as supplied by publisher]

Related citations
- [Induction of apoptosis by sphingosine, sphinganine, and C\(2\)-ceramide in human colon cancer cells, but not by C\(2\)-dihydroceramide.](#)
 4. Ahn EH, Schroeder JJ. *Anticancer Res*. 2010 Jul;30(7):2881-4. PMID: 20683027 [PubMed - indexed for MEDLINE]

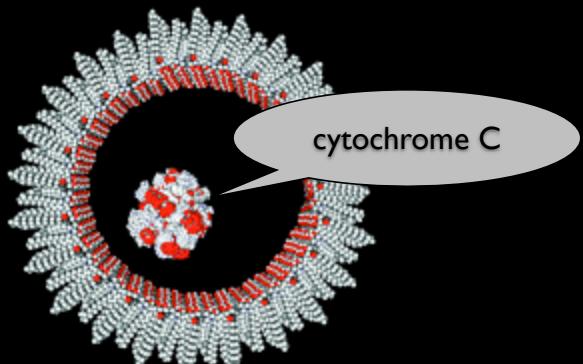
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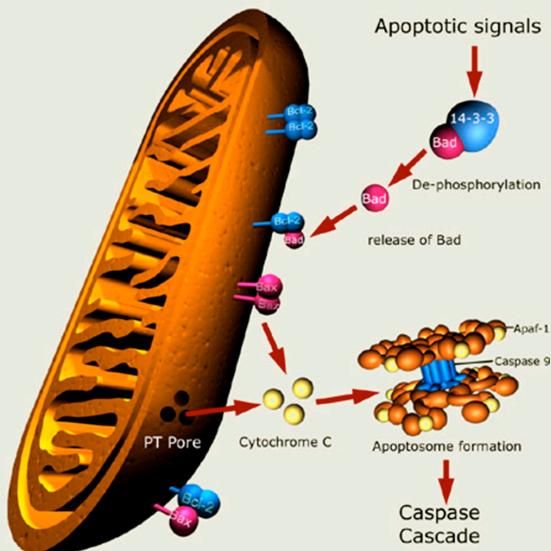


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ceramide channels in mitochondria
trigger apoptosis



25



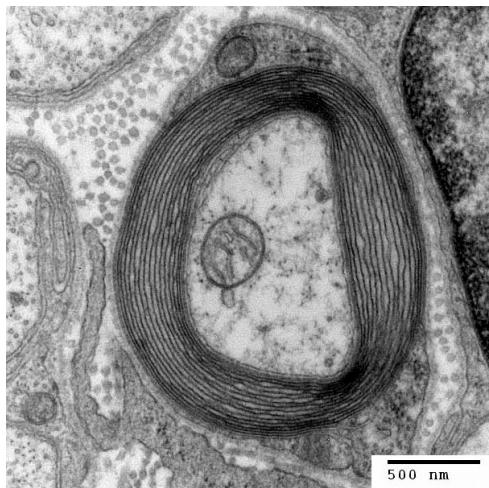
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Membrane lipids are degraded by a
battery of specific hydrolases in
lysosomes



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cross-section of a nerve axon



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