

1

Acyl chain Platform Polar Head Group



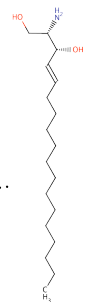
2

phospholipids and triacylglycerols



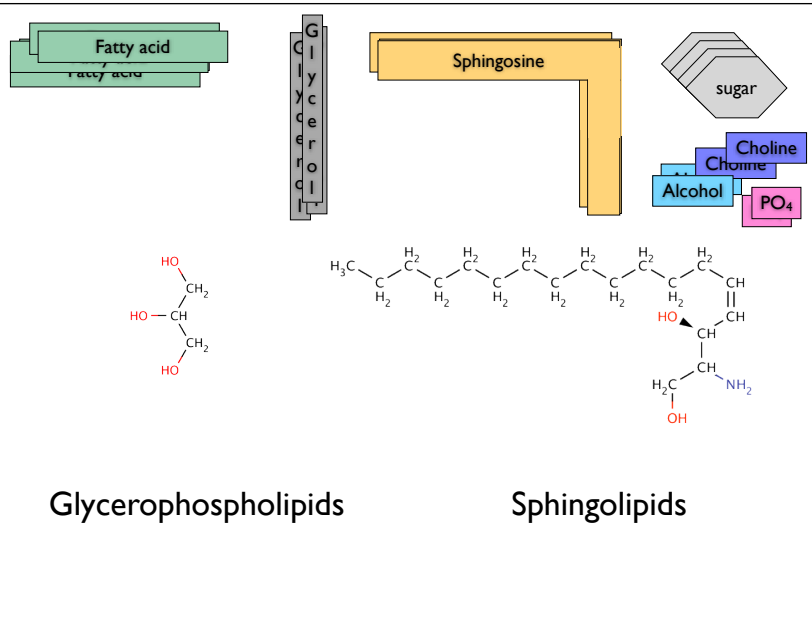
Glycerol

Sphingolipids

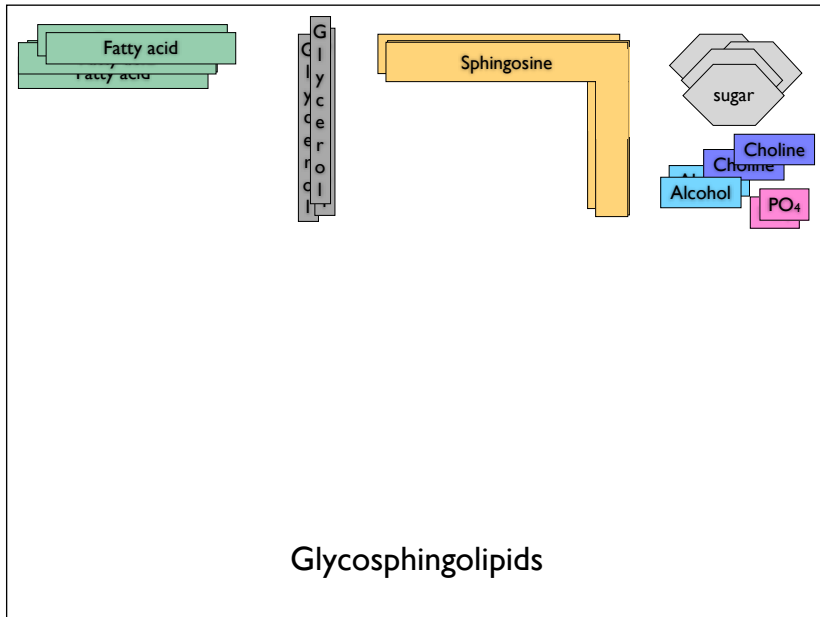


Sphingosine

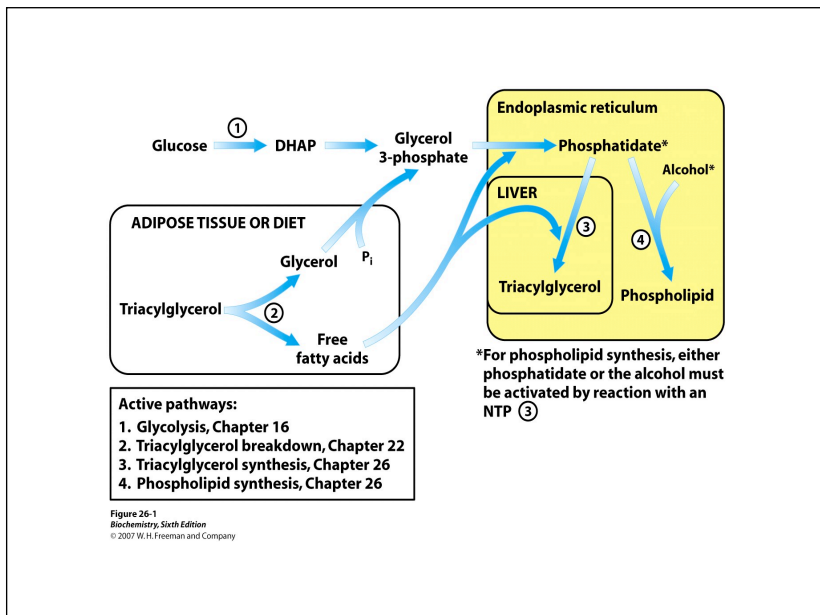
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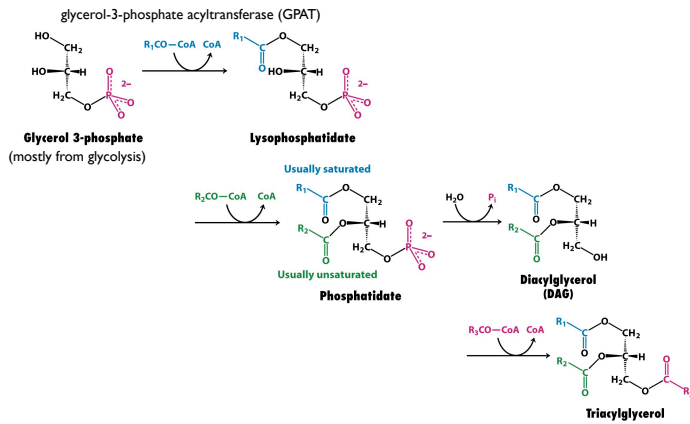
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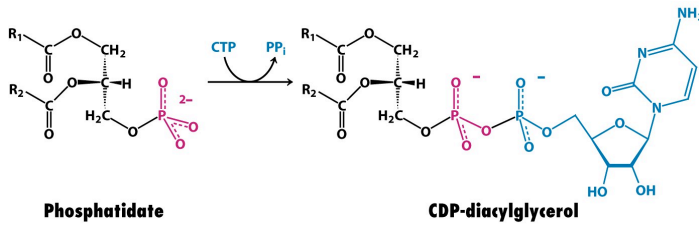


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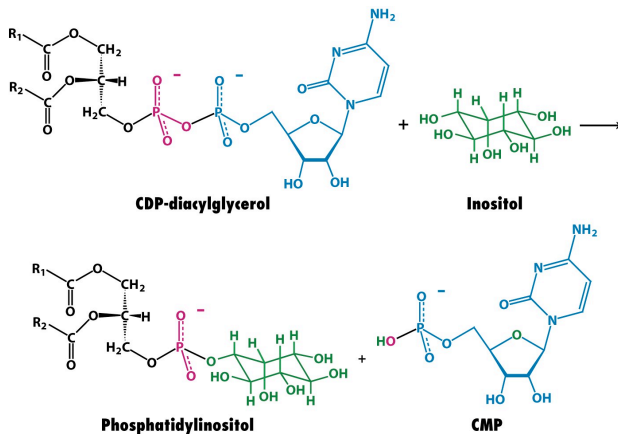


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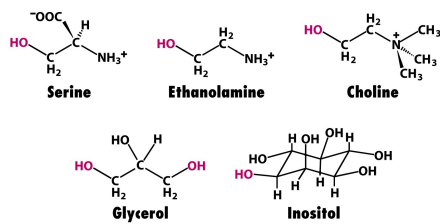
Key committed step in the synthesis of phospholipids



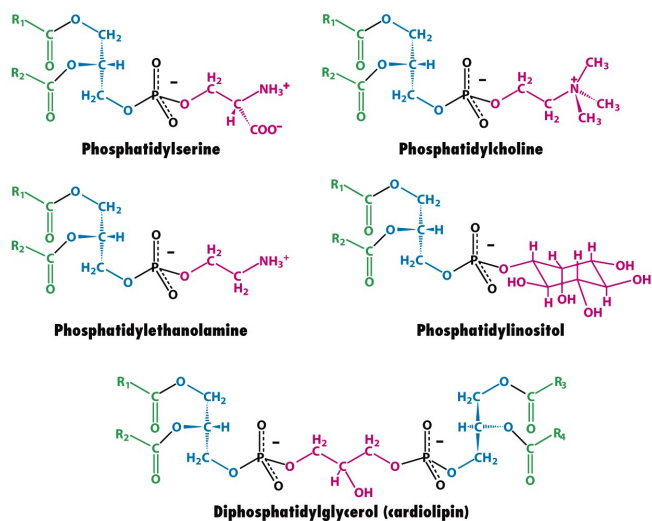
8



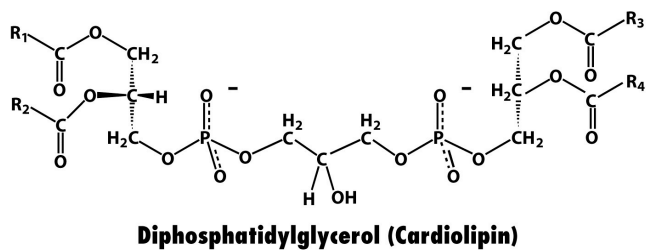
9



10



11



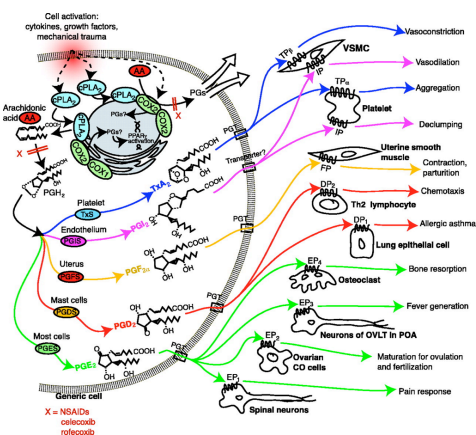
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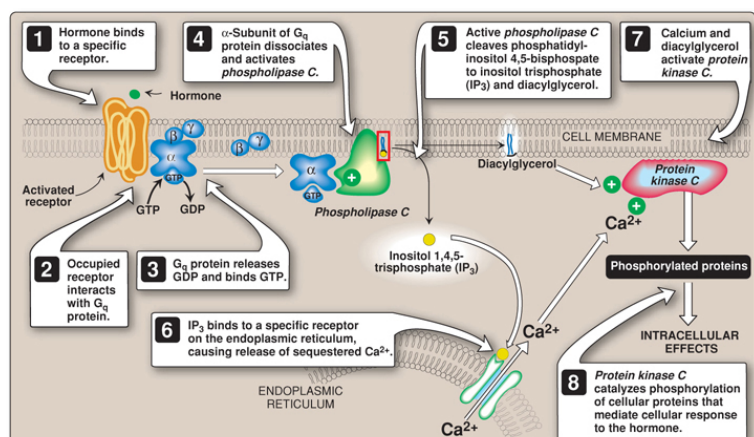
phospholipase A₂

arachidonic acid
(essential)

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



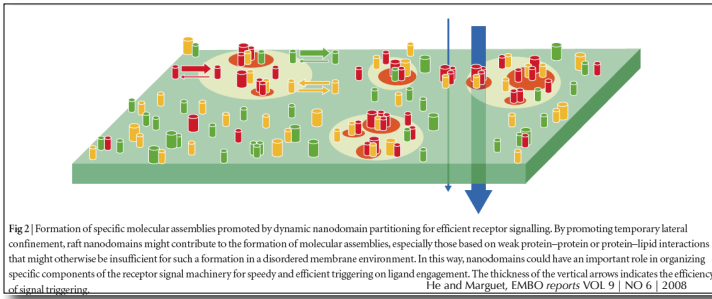
Phospholipase C cleaves phosphatidylinositol to release IP₃ and DAG



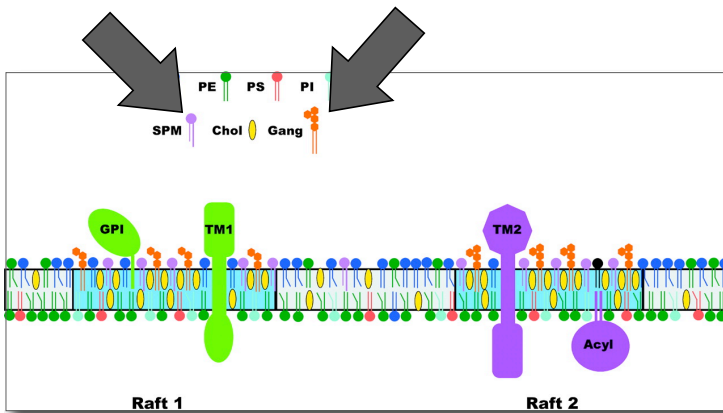
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Lipid rafts are thought to promote molecular assemblies and to drive conformational changes in membrane proteins

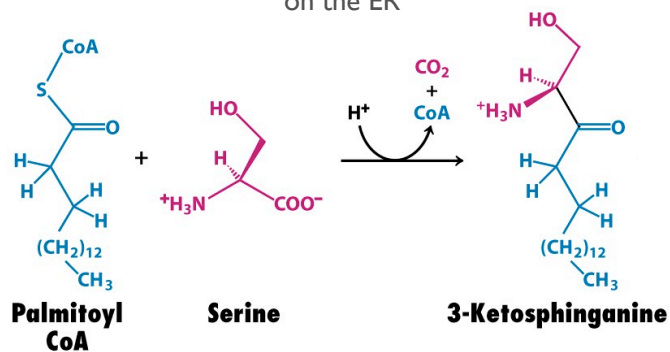


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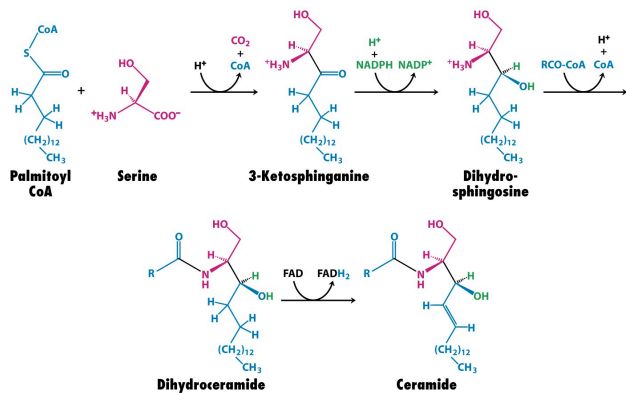


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de novo synthesis of sphingolipids begins with the condensation of palmitoyl-CoA with serine by **serine palmitoyl transferase (pyridoxal phosphate)** on the ER



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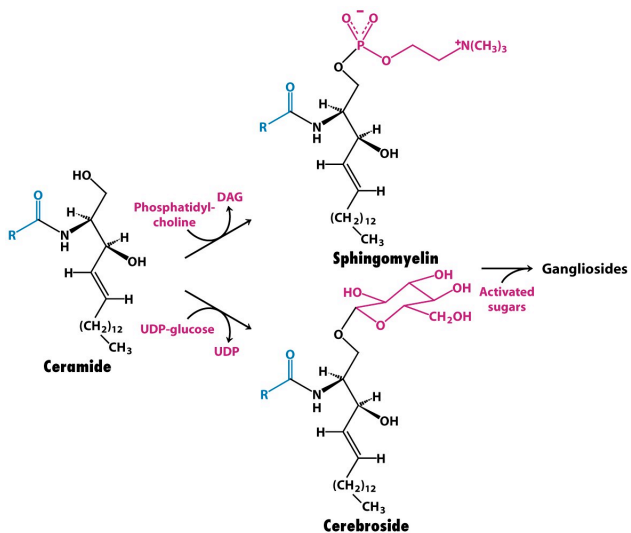


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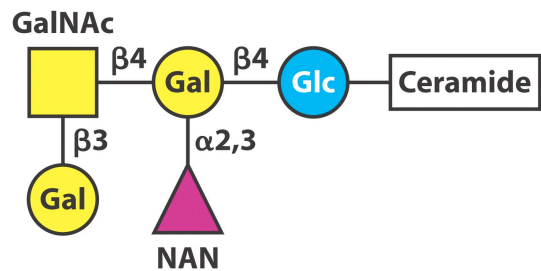
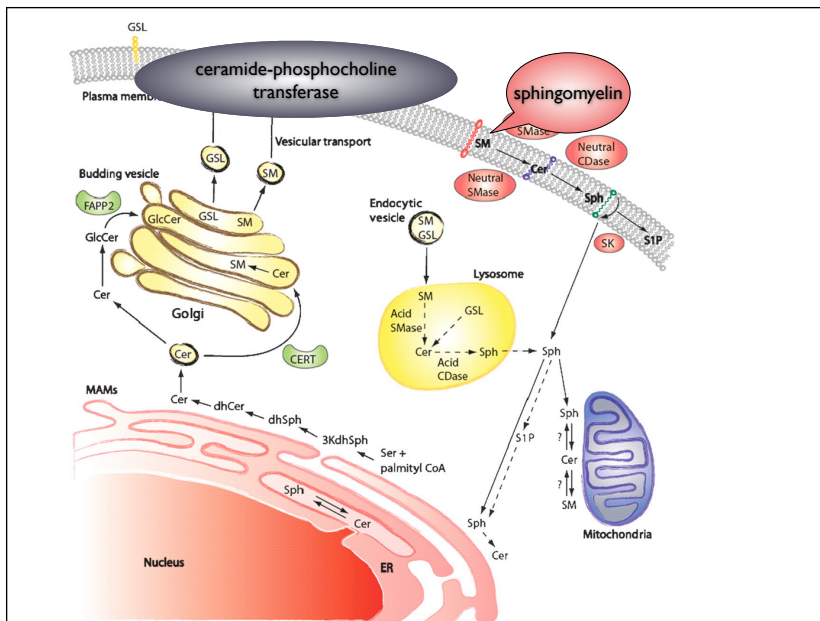




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



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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;19(1):239. [Epub ahead of print]
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[Exogenous cell-permeable C6 ceramide sensitizes multiple cancer cell lines to Doxorubicin-induced apoptosis by promoting AMPK activation and mTORC1 inhibition.](#)

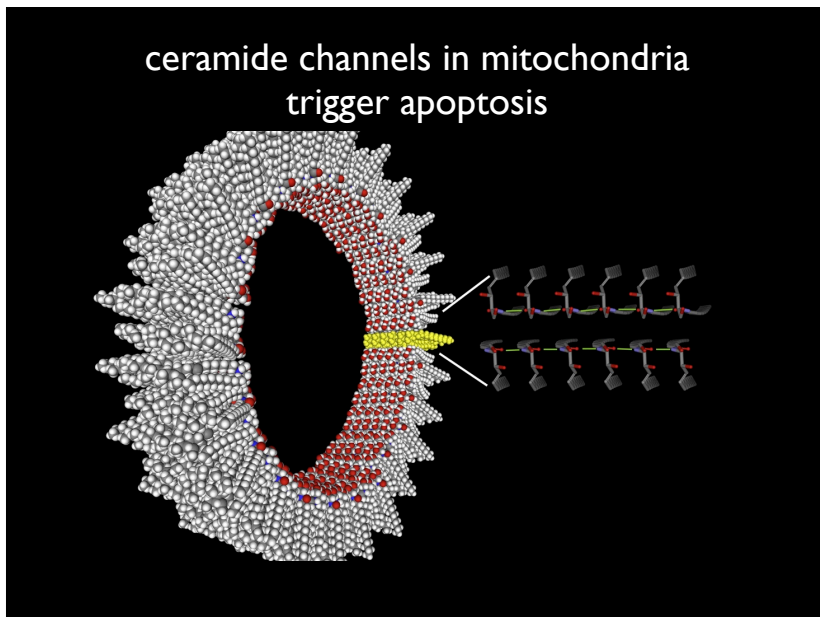
Ji C, Yang B, Yang YL, He SH, Miao DS, He L, Bi ZG. Oncogene. 2010 Aug 30. [Epub ahead of print]
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[Induction of apoptosis by sphingosine, sphinganine, and C\(2\)-ceramide in human colon cancer cells, but not by C\(2\)-dihydroceramide.](#)

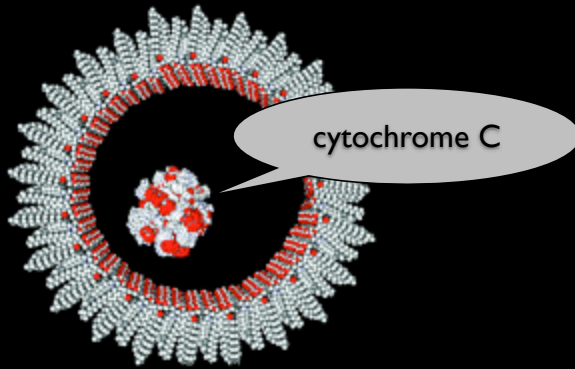
4. Ahn EH, Schroeder JJ. Anticancer Res. 2010 Jul;30(7):2881-4.
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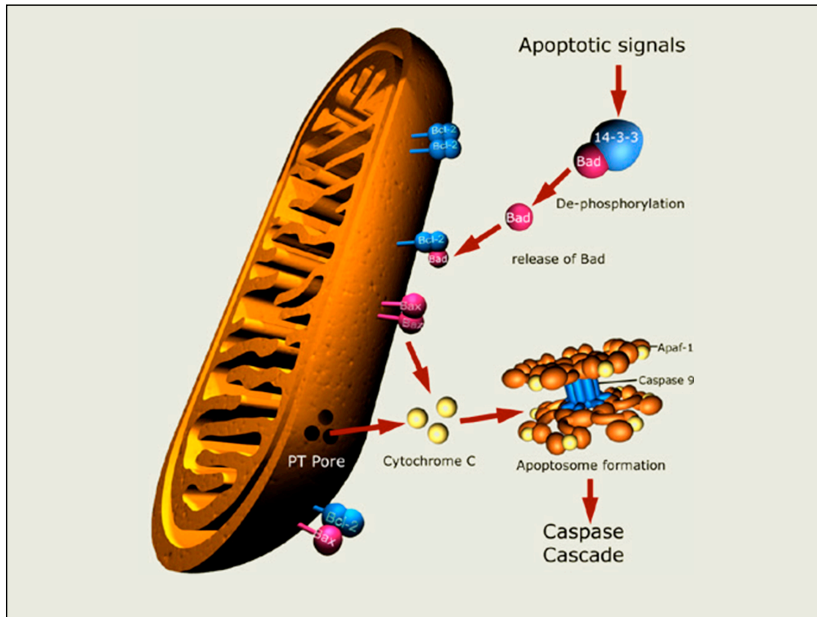
5. ...



ceramide channels in mitochondria
trigger apoptosis



25



26

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



27

cross-section of a nerve axon

