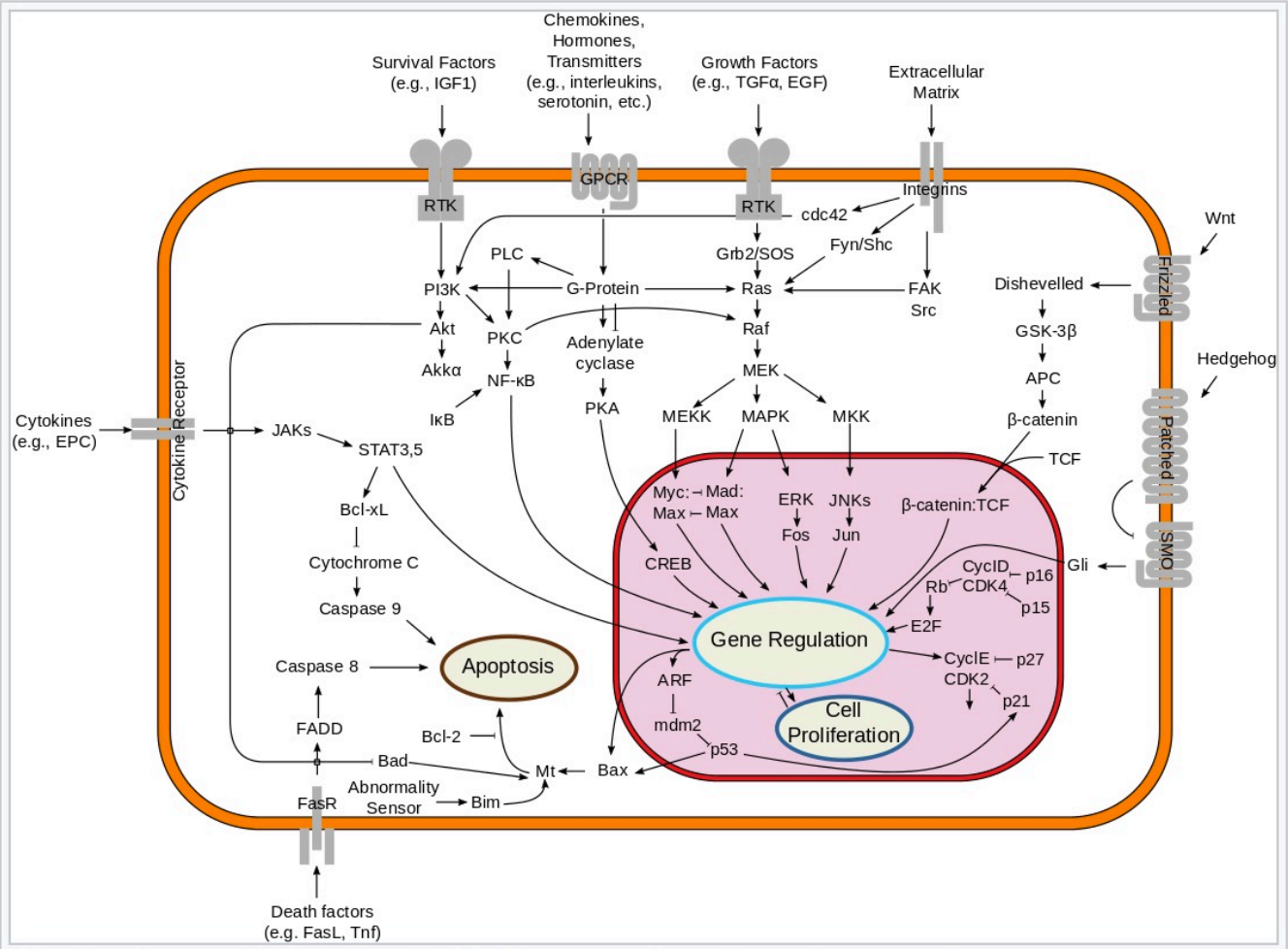
Protein kinase C

Protein kinase C also known as PKC (EC 2.7.11.13) is a family of protein kinase enzymes that are involved in controlling the function of other proteins through the phosphorylation of hydroxyl groups of serine and threonine amino acid residues on these proteins. PKC enzymes in turn are activated by signals such as increases in the concentration of diacylglycerol (DAG) or calcium ions (Ca2+). Hence PKC enzymes play important roles in several signal transduction cascades.



Simplified representation of major signal transduction pathways in mammals.

The PKC family consists of fifteen isozymes in humans.

They are divided into three subfamilies, based on their second messenger requirements: conventional (or classical), novel, and atypical.

Conventional ©PKCs contain the isoforms α, βI, βII, and γ. These require Ca2+, DAG, and a phospholipid such as phosphatidylserine for activation. Novel (n)PKCs include the δ, ε, η, and θ isoforms, and require DAG, but do not require Ca2+ for activation. Thus, conventional and novel PKCs are activated through the same signal transduction pathway as phospholipase C. On the other hand, atypical (a)PKCs (including protein kinase Mζ and ι / λ isoforms) require neither Ca2+ nor diacylglycerol for activation. The term “protein kinase C” usually refers to the entire family of isoforms.