

Lipid Signaling in Health and Disease

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Lipid signaling involves two distinct groups of lipids. Intracellular lipids that function as second messengers in prominent signal transduction pathways and extracellular lipids that function as agonists for plasma membrane receptors. We will discuss two examples: the second messenger phosphatidylinositol 3,4,5-trisphosphate (PIP3) and the bioactive lipid phosphate agonist lyso-phosphatidic acid (LPA). Deregulation of PIP3 and LPA metabolizing enzymes and/or their effector proteins impacts on almost all aspects of CNS function including, neuronal growth, differentiation, migration, axon guidance and branching, as well as synapse formation and function. Knowledge of the repertoire and the modes of function of these signaling lipids pave the way for pursuing novel pharmacological approaches for treating psychiatric and developmental CNS diseases in the future.