

Lipoprotein Receptors Integrate Lipid Metabolism, Brain Development and Neurotransmission

ApoE receptors, which include the low-density-lipoprotein (LDL) receptor and LDL receptor-related proteins (LRPs), control plasma cholesterol homeostasis and defend the vasculature against atherosclerosis. Yet, in the course of evolution these genes appeared in their modern form already in the most primitive multicellular organisms, which lack even rudimentary circulatory systems. Our work has uncovered novel and essential functions for these ancient receptors that go beyond the mere transport of lipids and cholesterol. As integral components of fundamental cellular signal transduction pathways, lipoprotein receptors maintain the integrity of the vascular wall, control organ development, including the formation of the brain, and also regulate synaptic transmission.