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The role of apolipoprotein D in lipid metabolism and metabolic syndrome

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Apolipoprotein D (apoD) is a member of the lipocalin super family. It transports small hydrophobic compounds such as arachidonic acid, progesterone and pregnenolone. In human, apoD is found in the plasma fraction, associated with high-density lipoprotein (HDL). It is highly expressed in the brain, adrenal glands, kidneys, pancreas and placenta but poorly expressed in intestine and liver. In contrast, the murine expression of the apoD gene is almost exclusively expressed in the central nervous system (CNS). Short overexpression of apoD in liver of obese mice using adenovirus improved triglyceride profiles, correlating with increased plasma LPL activity and enhanced postprandial fat tolerance. However, transgenic mice (Tg) with increased expression of human apoD (H-apoD) in the liver develop metabolic defects at one year of age. H-apoDTg mice are not obese and have normal lipid concentration in circulation. They are glucose intolerant, insulin resistant, and develop hepatic steatosis. In these mice, hepatic PPAR γ expression is increased and consequently Plin2 and Cide A/C leading to increased lipid droplets formation. Expression of the fatty acid transporter CD36 is also increased associated with elevated fatty acid uptake. Despite modulation of hepatic lipogenic gene expression, de novo lipogenesis is not altered. Elevated ApoD expression activates PPAR γ transcriptional activity by increasing the transport of one of PPAR's natural ligand arachidonic acid into the cell. It is now clear that apoD not only plays a role in the protection of the central nervous system but is also associated with lipid metabolism and associated metabolic syndrome.

Biography

Catherine Mounier obtained her PhD in 1994 from University of Rennes I in France. She then moved to Iowa City, IA to pursue a Post-doctoral position in University of Iowa working on de novo lipogenesis. From 1996 to 2002, she served as Associate Research Scientist at McGill University in Montreal working on EGF and insulin signaling. In 2003, she obtained a position as Assistant Professor in the Department of Biological Sciences of University of Quebec in Montreal. She became a full Professor in 2011 and since 2012 she is the Head of the department. She has published many papers in reputed journals such as molecular endocrinology, endocrinology and diabetologia. His research is oriented towards understanding the molecular mechanisms of lipid droplets formation in liver and the impact on metabolic disorders.

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