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Ulrike Taschler

Institute of Molecular Biosciences, University of Graz, Austria

ABHD13 – a novel lysophospholipid hydrolase involved in brain lipid metabolism

Lipids play a crucial role in regulating various biological processes, including membrane synthesis, energy storage, and cellular signaling. Therefore, lipid synthesis and degradation must be tightly regulated, and imbalances are associated with common lipid-associated disorders. Alpha/beta hydrolase domain-containing proteins (ABHDs) play key roles in physiological processes, and several ABHD proteins have been associated with human genetic disorders. While some members of the ABHD family are well studied, others remain poorly characterized, and the physiological substrates and biological function of these ABHDs remain to be investigated. ABHD13 is an uncharacterized serine hydrolase. In this presentation, we show that ABHD13 acts as lipid hydrolase with a preference for lyso-phospholipids and monoacylglycerol. Mice globally lacking ABHD13 (ABHD13-ko) are fertile and exhibit normal growth and weight. Remarkably, however, ABHD13-ko mice exhibit reduced brain weight, and behavioral analysis of ABHD13-ko mice revealed decreased spontaneous locomotor activity. Genetic deletion of ABHD13 results in alterations in the lipid composition of neural cells and the brain. Together, our data indicate that ABHD13 acts as lyso-phospholipase regulating motor coordination and neuronal function in mice.