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Handb Exp Pharmacol. 2011;(203):75-104. doi: 10.1007/978-3-642-17214-4_4.

Cannabinoids and endocannabinoids in metabolic disorders with focus on diabetes.

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Abstract

The cannabinoid receptors for Δ(9)-THC, and particularly, the CB(1) receptor, as well as its endogenous ligands, the endocannabinoids anandamide and 2-arachidonoylglycerol, are deeply involved in all aspects of the control of energy balance in mammals. While initially it was believed that this endocannabinoid signaling system would only facilitate energy intake, we now know that perhaps even more important functions of endocannabinoids and CB(1) receptors in this context are to enhance energy storage into the adipose tissue and reduce energy expenditure by influencing both lipid and glucose metabolism. Although normally well controlled by hormones and neuropeptides, both central and peripheral aspects of endocannabinoid regulation of energy balance can become dysregulated and contribute to obesity, dyslipidemia, and type 2 diabetes, thus raising the possibility that CB(1) antagonists might be used for the treatment of these metabolic disorders. On the other hand, evidence is emerging that some nonpsychotropic plant cannabinoids, such as cannabidiol, can be employed to retard β-cell damage in type 1 diabetes. These novel aspects of endocannabinoid research are reviewed in this chapter, with emphasis on the biological effects of plant cannabinoids and endocannabinoid receptor antagonists in diabetes.

PMID: 21484568 DOI: [10.1007/978-3-642-17214-4_4](https://doi.org/10.1007/978-3-642-17214-4_4)

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