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Fetal CBD exposure increases risks for glucose intolerance and insulin resistance

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The prevalence and cost of diabetes in the United States is growing at an alarming rate, but we lack understanding about all of the underlying causes for this increase. Adverse exposures during fetal development can contribute to glucose intolerance and insulin resistance, the hallmarks of diabetes. Over 20% of pregnant women consume cannabidiol (CBD) to help with nausea, anxiety, and pain because it is readily available, and they believe it is safe. However, CBD activates receptors that modulate glucose homeostasis and are expressed during fetal development, and maternally consumed CBD diffuses across the placenta and accumulates in fetal tissues. These observations raise the alarming possibility that CBD consumption during pregnancy may contribute to later life glucose intolerance and insulin resistance in the offspring. However, we do not know the cellular or molecular mechanisms by which fetal CBD exposure disrupts glucose homeostasis. Understanding how fetal exposures to substances that impact future metabolic disease risk is paramount to combating diabetes. Our data show that fetal CBD exposure reduces glucose tolerance and plasma insulin levels in adult male offspring but reduces insulin sensitivity in adult female offspring in the absence of changes to energy balance or body composition. CBD consumption is increasing nationally among pregnant women, yet little is known about the long-tern consequences. Studies investigating how fetal CBD exposure impacts offspring glucose homeostasis are urgently needed to direct evidence-based public health messaging for healthy pregnancies and optimal child health.

Biography

Emily Bates, PhD leads research on how ion channel activity impacts morphological development and how microtubules are regulated for normal morphological development of the mammalian brain. Her group elucidated a mechanism by which the Kir2.1 potassium channel impacts Bone Morphogenetic Protein (BMP) signalling for correct craniofacial development in mice, building on our previous papers that show these channels impact BMP signalling for wing development in flies. This work is the premise for our more recent pursuits testing the hypothesis that exposure to components of marijuana (cannabidiol, CBD) that impact ion channels affect fetal brain, pancreas, and peripheral metabolic tissue development.