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Featured Investigator: Dr. Sean S. Davies

Sean S. Davies, PhD

Associate Professor of Pharmacology

Research Specialty:

Bioactive lipids

Diseases related to obesity including type 2 diabetes and cardiovascular disease

Gut microbiota

Drug delivery



Research Description:

Dr. Davies and his lab are designing new interventions by studying the controlling mechanisms of lipid mediators, or bioactive lipids.

One area of focus in the Davies lab has been therapeutic modification of gut bacteria, results of which have been recently published in the Journal of Lipid Research (see featured article on home page). The microbes residing in the gut have been linked to adiposity, relating to body fat, and insulin resistance. When you eat, the body begins to synthesize a molecule called N-acylphosphatidylethanolamines (NAPEs) in the intestines. NAPEs employ similar effects to leptin, the adipose-regulating hormone, comprising of reducing weight gain and food intake. However, the means by which NAPEs did this was unclear. The Davies lab studied mice given NAPEs and their bioactive metabolites N-acyl-ethanolamides (NAEs) via the intestines. They found that the mice with the missing enzyme needed, NAPE-PLD, were not able to reduce food intake or weight gain. The NAPE-PLD enzyme is needed to produce the leptin-like effects of NAPEs in the intestine. It is possible that this may lead to future therapies to treat obesity and other health complications incurred from obesity, such as cardiovascular disease.

The Davies lab is also investigating reactive lipid aldehydes and how they are affected by oxidative stress. The lab developed means to isolate the effects on reactive lipids from the other products formed from the process through mass spectrometry. Davies has also been studying aldehyde-modified phosphatidylethanolamines and how these molecules exert inflammation via oxidative stress.

For more information on the Davies lab, please visit: <https://labnodes.vanderbilt.edu/member/profile/id/10511>