



# Professor Michael Cowley

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Metabolic Disease and Obesity Program

## OTHER PROGRAM AFFILIATIONS



Cardiovascular Disease



Neuroscience

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Our laboratory focuses on developing new therapies for obesity, diabetes and metabolic disorders. Our research has mapped the neural circuits in the brain that sense nutrients, glucose, and fat to control appetite and body weight. That map of the brain helped us develop therapeutics for the treatment of obesity. We are now interested to determine if similar pathways can regulate blood glucose levels. Our lab is also looking at how obesity causes heart disease and how to reverse obesity-induced heart disease risks.

## Research Project:

1. How does leptin increase blood pressure?
2. What causes hypertension in pregnancy?
3. How does the brain regulate glucose disposal by the body?
4. Does the brain regulate glucose secretion by the liver?
5. Can we identify, and modify, new pathways that regulate body weight or blood glucose?

## Selected significant publications:

1. Koch M, Varela L, Kim JG, Kim JD, Hernández-Nuño F, Simonds SE, Castorena CM, Vianna CR, Elmquist JK, Morozov YM, Rakic P, Bechmann I, **Cowley MA**, Szigeti-Buck K, Dietrich MO, Gao XB, Diano S, Horvath TL. 2015. Hypothalamic POMC neurons promote cannabinoid-induced feeding. *Nature* 519 (7541): 45-50
2. Dodd GT, Decherf S, Loh K, Simonds SE, Wiede F, Balland E, Merry TL, Münzberg H, Zhang ZY, Kahn BB, Neel BG, Bence KK, Andrews ZB, **Cowley MA**, Tiganis T. 2015. Leptin and insulin act on POMC neurons to promote the browning of white fat. *Cell* 160 (1-2): 88-104
3. Balland E, **Cowley MA**. 2015 New insights in leptin resistance mechanisms in mice. *Front Neuroendocrinol.* 39:59-65.
4. Simonds SE, Pryor JT, Ravussin E, Greenway FL, Dileone R, Allen AM, Bassi J, Elmquist JK, Keogh JM, Henning E, Myers MG Jr, Licinio J, Brown RD, Enriori PJ, O'Rahilly S, Sternson SM, Grove KL, Spanswick DC, Farooqi IS, **Cowley MA**. 2014. Leptin mediates the increase in blood pressure associated with obesity. *Cell* 159 (6): 1404-16
5. Spanswick DC, Simonds SE, **Cowley MA**. 2012. Transmitter time: synaptic plasticity and metabolic memory in the hypothalamus. *Cell Metabolism* 15 (3): 275-6