



## Professor Brian Oldfield

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### OTHER PROGRAM AFFILIATIONS



Neuroscience

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The primary focus of the laboratory is brown fat biology, particularly its innervation. Given the consensus that activation of the  $\beta$ -adrenoceptor on brown or “brown – like” beige fat cells by noradrenaline is a critical element in the effective functional recruitment of energy expenditure in these tissues, we have focussed on the details of the central neural circuits involved. This theme is being pursued in the first four of the funded projects listed below.

In addition, there are two other major projects in the lab which have unexpected overlap with our focus on brown fat biology. One is the use of our rodent model of the adjustable gastric band which is being used to define mechanisms underpinning the efficacy of the procedure, particularly in relation to the use of adjunctive pharmacotherapies with the band. The second is a functional dissection of midbrain reward pathways, using Cav-Cre viruses and DREADD technologies, to define the contribution of these pathways to the mediation of voluntary starvation in a rodent model of anorexia nervosa.

### Research Projects

1. “Smart Food” – The fulcrum in the energy balance equation
2. Determining the impact of the nutrient milieu in the CNS on thermogenic tone using obese prone and obese resistant rodents
3. Central neural regulation of brown fat function – glucose sensing
4. Central neural regulation of brown or beige fat function
5. The use of a rodent model of the AGB to define the mechanisms underlying increased efficacy of the AGB when combined with pharmacotherapies
6. Reward pathways and their involvement in the etiology of anorexia nervosa

### Selected significant publications:

1. Adler ES, Hollis JH, Clarke IJ, Grattan DR, **Oldfield BJ**. 2012. Neurochemical characterization and sexual dimorphism of projections from the brain to abdominal and subcutaneous white adipose tissue in the rat. *J Neurosci* 32 (45): 15913-21
2. Verty A, Lockie SH, Stefanidis A, **Oldfield BJ**. 2012. Anti-obesity effects of the combined administration of CB1 receptor antagonist rimonabant and melanocortin concentrating hormone antagonists in diet induced obese mice. *International Journal of Obesity* 32:279-287
3. Kampe J, Stefanidis A, Lockie SH, Brown WA, Dixon JB, Odoi A, Spencer SJ, Raven J, **Oldfield BJ**. 2012. Neural and humoral changes associated with the adjustable gastric band: insights from a rodent model. *International Journal of Obesity* 36: 1403-1411
4. Verty AN, Allen AM, **Oldfield BJ**. 2010. The endogenous actions of hypothalamic peptides on brown adipose tissue thermogenesis in the rat. *Endocrinology* 151(9):4236-46
5. **Oldfield BJ**, Giles ME, Watson A, Anderson C, Colvill LM, McKinley MJ. 2002. The neurochemical characterisation of hypothalamic pathways projecting polysynaptically to brown adipose tissue in the rat. *Neuroscience* 110(3):515-26