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Monash Biomedicine Discovery Institute
Metabolic Disease and Obesity Program

OTHER PROGRAM AFFILIATIONS



Cancer



Infection and Immunity

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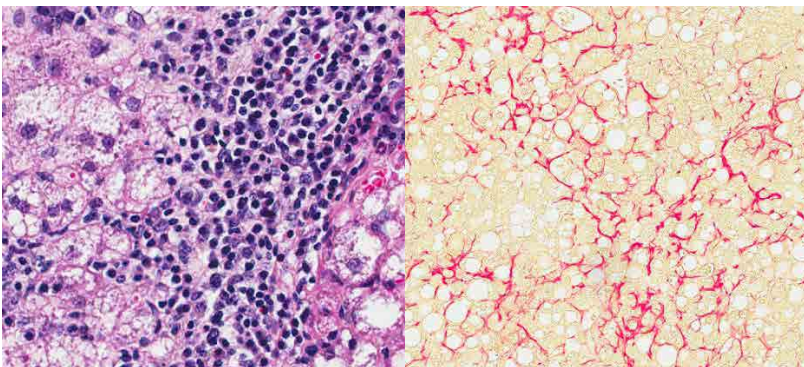
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A cell's ability to respond to its extracellular environment involves a complex and highly organised series of events referred to as cellular signalling. Our laboratory focuses on a group of enzymes known as Protein Tyrosine Phosphatases (PTPs) that regulate tyrosine phosphorylation-dependent cellular signalling. We use cutting edge biochemical, cell biological and imaging approaches as well as knockout mice and Drosophila genetics to delineate the roles of PTPs in varied human diseases. A key focus of the laboratory is on understanding the roles of PTPs in the control of energy expenditure and glucose homeostasis.

Research Projects

1. The central nervous system (CNS) control of energy expenditure and glucose homeostasis in obesity
2. Molecular mechanisms by which obesity drives the development of fatty liver disease
3. Obesity and the gut microbiome
4. Obesity and cancer; cancer metabolism



Nonalcoholic steatohepatitis and liver fibrosis in mutant mice fed a high fat diet.

Selected significant publications:

1. 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
2. Gurzov EN, Tran M, Fernandez-Rojo MA, Merry TL, Zhang X, Xu Y, Fukushima A, Waters MJ, Watt MJ, Andrikopoulos S, Neel BG, **Tiganis T**. 2014. Hepatic oxidative stress promotes insulin-STAT-5 signalling and obesity by inactivating protein tyrosine phosphatase N2. *Cell Metabolism* 20 (1): 85-102
3. Merry TL, Tran M, Stathopoulos M, Wiede F, Fam BC, Dodd GT, Clarke I, Watt MJ, Andrikopoulos S, **Tiganis T**. 2014. High-fat-fed obese glutathione peroxidase 1-deficient mice exhibit defective insulin secretion but protection from hepatic steatosis and liver damage. *Antioxid Redox Signal*. 20(14):2114-29
4. Loh K, Fukushima A, Zhang X, Galic S, Briggs D, Enriori PJ, Simonds S, Wiede F, Reichenbach A, Hauser C, Sims NA, Bence KK, Zhang S, Zhang Z-Y, Kahn BB, Neel BG, Andrews ZA, Cowley MA, **Tiganis T**. 2011. Elevated hypothalamic TCPTP in obesity contributes to cellular leptin resistance. *Cell Metabolism* 14: 684-99
5. Loh K, Deng H, Fukushima A, Cai X, Boivin B, Galic S, Bruce C, Shields BJ, Skiba B, Ooms L, Stepto N, Wu B, Mitchell CA, Tonks NK, Watt MJ, Febbraio MA, Crack PJ, Andrikopoulos S, **Tiganis T**. 2009. Reactive oxygen species enhance insulin sensitivity. *Cell Metabolism* 10: 260-272