



A unique hepatic lipid profile in BALB/c mice correlates with protection from high fat diet-induced glucose intolerance

Thursday 17 April 1 – 2pm

Speaker

Dr Nigel Turner

University of New South Wales

Location

Slatyer Seminar Room

R.N. Robinson Building (Bldg 46),
Cunningham Close, ANU

Contact

E rowena.martin@anu.edu.au

T +61 2 619 70051

This lecture is free and open to the public

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In a recent mouse strain comparison we showed that C57BL6, 129X1, DBA/2 and FVB/N mice all develop obesity and glucose intolerance in response to 8 wk of high fat diet (HFD), while BALB/c mice were protected from HFD-induced glucose intolerance, despite having elevated adiposity. Intriguingly, similar to the other strains, BALB/c mice displayed changes in many parameters thought to be important in insulin resistance and glucose intolerance, such as elevated muscle lipids and increased adipose tissue inflammation. What differed in HFD-fed BALB/c mice was the hepatic lipid profile. The 4 strains that developed glucose intolerance displayed increases in multiple diacylglycerol (DAG) and triacylglycerol (TAG) species,

however BALB/c mice on a HFD displayed limited DAG and TAG accumulation. Additionally, there were similar changes in ceramide (Cer) and sphingomyelin (SM) species in liver of C57BL6, 129X1, DBA/2 and FVB/N mice, with 'long-chain' Cer and SM (C16-C22) increased and 'very long-chain' Cer and SM (C>22) decreased with HFD. Strikingly, HFD-fed BALB/c mice displayed the opposite trend for these sphingolipid species. Our findings suggest that alterations in hepatic lipid metabolism, particularly sphingolipids, are important in protecting BALB/c mice from defects in glucose metabolism induced by a HFD.

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