



# Manitoba Neuroscience Network

Friday, October 28th, 2011 | 9:00 - 10:00am



## Dr. Mark Fry

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University of Manitoba

**Topic:** Roles of the subfornical organ in regulating energy balance.

**Location:** PX236/238 PsychHealth, Bannatyne Campus

The main focus of the research carried out in the lab is to understand the physiology of neurons that regulate homeostasis. In particular, the lab is interested in understanding regulation of electrical activity in neurons that control food intake and other aspects of energy homeostasis. Neurons of the sensory circumventricular organs (CVOs) are thought to be especially important for regulation of homeostasis because these neurons are not protected by the blood-brain barrier, and are able to sense hunger-stimulating and satiety (hunger-ending) hormones circulating in the bloodstream.

A second focus of research aims to understand roles of different ion channels in the regulation of electrical excitability of neurons. Ion channels are proteins in neuronal cell membranes that undergo conformational changes to form a pore that allows charged ions such as  $\text{Na}^+$ ,  $\text{Ca}^{++}$ ,  $\text{K}^+$  and  $\text{Cl}^-$  to flow into or out of the cell. These "ionic currents" are the basis of the neuronal action potential and neuronal communication within the CNS. There is a large diversity of ion channels: dozens of ion channel gene families have been described, and many families have numerous isoforms. These isoforms exhibit only subtle structural differences, but often exhibit dramatic functional differences. Populations of neurons may express vastly different complements of these isoforms and the relationship between ion channel isoform expression and the patterns of neuronal electrical activity is only beginning to be understood. Acutely modulating neuronal ion channel properties by activating intracellular signalling pathways or by changing expression patterns of ion channels by disease or other stimulus can result in dramatic changes in neuronal function.

For more information, contact the MNN Office at  
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