



## Research Collaboration Opportunity

### **Title** X-chromosome inactivation: Understanding epigenetic regulation, and sex-differences

**PIs** Carolyn Brown

### **Description**

We have been exploring epigenetic gene regulation through the study of X-chromosome inactivation, the silencing of one X chromosome in females (46,XX) that achieves dosage compensation with males (46,XY). We focus on two areas: (1) the role of the long non-coding RNA XIST in establishing inactive chromatin; (2) the activity of genes on the inactive X, as almost a quarter of human X-linked genes show expression from the Xi and thus are not dosage-compensated between males and females.

### **Research stage**

Basic scientific research.

### **Types of collaborations**

Epigenetic control (particularly long non-coding RNA, DNA methylation)

X-linked gene expression (particularly genes that 'escape' X inactivation, including KDM5C, RPS4X).

We have developed integration sites to monitor cis-acting gene silencing by the XIST long non-coding RNA, and are now determining if those can also monitor action of other long non-coding RNAs.

### **Relevant publications**

(1) Kelsey AD, Yang C, Leung D, Minks J, Baldry SEL, Bogutz AB, Lefebvre L, Brown CJ. 2015. Impact of flanking chromosomal sequences on localization and silencing by the human non-coding RNA XIST. *Genome Biology*. 2015 Oct 2;16:208. doi: 10.1186/s13059-015-0774-2.

(2) Balaton, BP, and Brown CJ. 2016. Escape artists of the X chromosome. *Trends in Genetics*. PMID: 27103486

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