

Investigating how imprinted Grb10 influences brain growth

Supervisory team:

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Project description:

The gene Grb10 belongs to a group called the 'imprinted genes'. These mammalian specific genes are expressed from one parental copy only – unlike most other mammalian genes that, on average, are expressed equally from both inherited parental copies. The unique epigenetic status and functional roles of imprinted genes has therefore led to them being studied by molecular biologists, neuroscientists and evolutionary biologists. This PhD project aims to investigate their functional role. Imprinted genes are known to converge on key aspects of mammalian function, including growth. This PhD project will focus on an uninvestigated area, specifically the role of imprinted genes in regulating brain growth, using the Grb10 gene as a model. The project will use techniques ranging from rodent neuroimaging and histology, to cutting-edge gene expression analysis. Specifically, the student will use MRI/DTI techniques to assess brain volume and connectivity in mice lacking a paternal copy of Grb10; examine the cellular diversity of these brains; and use RNA-seq to investigate differences in gene expression in different cell types within the brain across adulthood. Consequently, the student will gain experience of a variety of laboratory-based research techniques, and a broad range of data analysis and programming skills.