2010 Winner

Christopher Gregg, Ph.D.

Postdoctoral Fellow
Harvard University

eppendorf & Science PRIZE FOR NEUROBIOLOGY

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Christopher Gregg received his BSc. in biochemistry from the University of Lethbridge, Canada. He carried out his graduate studies under Dr. Samuel Weiss at the University of Calgary studying the biology of neural stem cells in the developing and adult brain. He received his Ph.D. in 2006. He then joined Dr. Catherine Dulac's laboratory at Harvard University as a postdoctoral fellow funded by the Alberta Heritage Foundation for Medical Research and the Human Frontiers Science Program. Dr. Gregg's postdoctoral work has focused on the development of next generation sequencing approaches for the study of genomic imprinting and allele-specific gene expression programs in the brain. In 2011, Dr. Gregg will join the Department of Neurobiology & Anatomy and the Department of Human Genetics at the University of Utah as an assistant professor focused on understanding genetic and epigenetic pathways that influence central neural circuits involved in feeding, metabolism and neuroeconomic decision-making processes.

Parental Control over the Brain

Parents influence our brain development and behavior so substantially that they can set us on a course for life. Surprisingly, maternally and paternally inherited chromosomes are not functionally equivalent, due to heritable epigenetic marks established in the parental gametes, called genomic imprints. Understanding the nature of these parental effects on gene expression is potentially important for uncovering the basis of complex human neurological diseases and disorders. Christopher Gregg's essay describes his studies on maternal and paternal gene expression programs in the brain.

Dr. Gregg developed a novel method to profile gene expression from maternally versus paternally inherited gene copies expressed in the brain using high-throughput sequencing technologies. He used this approach to profile parent specific gene expression programs in the adult cortex and hypothalamus, the developing fetal brain, as well as to compare the male and female brain. He uncovered complex and dynamic parental effects that influence gene expression from ~1300 loci. His results suggest mothers and fathers play distinct roles in regulating the development and adult behavior of their offspring. These findings raise questions about how maternal versus paternal gene expression programs in the brain influence brain development, function and susceptibility to complex diseases and disorders.