FOR IMMEDIATE RELEASE
Montreal, October 10, 2012

Early life adversity affects broad regions of brain DNA in both rodents and humans

Study provides strong evidence of a biological process that embeds social experience in DNA that affects not just a few genes but entire networks of genes

Early life experience results in a broad change in the way our DNA is "epigenetically" chemically marked in the brain by a coat of small chemicals called methyl groups, according to researchers at McGill University. A group of researchers led by Prof. Moshe Szyf, a professor of Pharmacology and Therapeutics in the Faculty of Medicine, and research scientists at the Douglas Institute have discovered a remarkable similarity in the way the DNA in human brains and the DNA in animal brains respond to early life adversity. The finding suggests an evolutionary conserved mechanism of response to early life adversity affecting a large number of genes in the genome.

The research was published in a special volume of Proceedings of the National Academy of Sciences: *Biological Embedding of Early Social Adversity: From Fruit Flies to Kindergartners*, and confirms a biological process that embeds social experience in DNA in the brain and that affects not just a few genes but entire networks of genes. "Our data highlights the immense importance of the social environment during childhood and illustrates the profound consequences of child adversity on the way our DNA is programmed," says Szyf, a fellow of the Canadian Institute for Advanced Research (CIFAR).

Szyf and his coauthors examined differences in the way DNA is marked by methylation in the hippocampal region of the brain of humans who experienced abuse as children and non-abused controls, using samples from The Douglas – Bell Canada Brain Bank directed by Prof. Gustavo Turecki of the Douglas Mental Health University Institute. The human samples were compared to rats who received different maternal care early in life. Remarkably, DNA methylation changes that were associated with differences in early life experiences were detected in many similar genes in both species.

Although it has been known that early life experiences, particularly social experiences, have long-term impacts on future physical and mental health well-being, it was difficult to understand how these adversities were "embedded" biologically. While previous McGill studies had shown that a few candidate genes could be "epigenetically" marked by early life experiences, it was clear that early life experience had a profound impact on health that couldn't be explained by these few genes.

“This study provides strong evidence of a biological process that embeds social experience in DNA in the brain that affects not just a few genes but entire networks of genes,” says Szyf. “We highlighted the immense importance of the social environment during childhood and illustrated the profound consequences of child adversity on the way our DNA is programmed. Because of our new findings, we now have a broader understanding of how to prevent and treat mental and physical health challenges”.

More news from McGill University: http://www.mcgill.ca/newsroom/

“Conserved epigenetic sensitivity to early life experience in the rat and human hippocampus” is published in a special volume of the Proceedings of the National Academy of Sciences: *Biological Embedding of Early Social Adversity: From Fruit Flies to Kindergartners,* authored largely by researchers of the Canadian Institute for Advanced Research (CIFAR). This volume sets out an emerging new field of the developmental science of childhood adversity.

For more information about CIFAR: http://bit.ly/Olmg3N

Contact:
Cynthia Lee
Relations avec les médias | Media Relations
Université McGill **|** McGill University
t. 514.398.6754
c.514.793.6753
cynthia.lee@mcgill.ca

http://www.mcgill.ca/newsroom/
http://twitter.com/#!/McGilluMedia