



**GENETIC ROOTS:**  
Missing gene in lab mice may identify link between brain development and behaviour **6**



**PRACTICAL TIPS:**  
Managing psychotropics in the peri-operative period **10**



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**IS A PEDOPHILE BORN OR MADE?**  
James Cantor is using cutting edge MRI technologies to find the answer. **7**

**NAÎT-ON PÉDOPHILE OU LE DEVIENT-ON ?**  
*James Cantor cherche la réponse en utilisant les technologies de l'IRM to find the answer. **7***



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# MRIs link pedophilia to early brain development

by Jadranka Bacic

Is a pedophile born or made? James Cantor, a clinical psychologist at the Centre for Addiction and Mental Health (CAMH) in Toronto, has been trying to answer this question for years and what he has learned could potentially yield strategies for preventing the development of pedophilia.

Dr. Cantor believes the roots of pedophilia lie in the wiring of the brain. He has spent years studying the neurobiological make-up of hundreds of pedophiles at CAMH's Kurt Freund Laboratory with the help of brain scanning technologies.

His groundbreaking discovery began with a standardized assessment of over 1,000 men being evaluated for pedophilia or other sexual disorders at the Kurt Freund Laboratory in Toronto between 1995 and 2006.

Dr. Cantor says patterns began to emerge. He found that pedophiles are more likely to have lower IQs and have failed grades in school, are more likely to have suffered brain injuries as children, are shorter on average than non-pedophilic sexual offenders, and are three times more likely to be left-handed. They were also more likely to have mothers who suffer or have suffered from a psychiatric illness.

"There was clue after clue that something was different about these men," says Dr. Cantor. "And much of it seemed to be related to early brain development."

While he admits that some of these findings could be explained by external psychosocial factors, there is no known environmental influence that would affect a person's handedness. "That is something that is determined entirely by brain organization and established before birth," explains Dr. Cantor. "If being left-handed is related to being pedophilic, then there has to be some chain of events that leads all the way back to the womb."

Pedophilia, according to Dr. Cantor, appears to be just one of a constellation of characteristics which point to a problem with the development of the brain in the womb, such as being left-handed, having a low IQ and being shorter in stature than the average male.

His next step was to look more directly at the brains of pedophiles versus those of non-sexual offenders with the help of magnetic resonance imaging (MRI) technologies. A total of 127 men participated in this follow-up study.

"The results surprised me and my entire team," says Dr. Cantor. There were two schools of thought on where the differences in the brain would be located, he explains. Some researchers believed the differences would be found in the frontal lobe; the emotional control centre of the brain housing impulse control. Others believed distinctions would be found deep in the limbic system of the temporal lobe; the area of the brain that controls sexual behaviour and urges.

"We kept re-running the analyses because we had trouble believing our own results," says Dr. Cantor. "It turned out that the differences weren't in either the frontal or temporal lobe. Instead, we found variations existed in the white matter tissue that connects all regions of the brain. There was significantly less of it in the brains of male pedophiles."

The eureka moment came when Dr. Cantor glanced over at a paper evaluating which parts of the brain respond to sexual stimuli. It was sitting on his desk next to the pile of results from his own MRI study. It showed that the areas of the brain which light up in response to sexual stimuli were the same in both pedophiles and non-pedophiles. Even more important was that these areas were the ones where variations were found in the connective white matter.



"It seems the brain doesn't have a sex centre, but instead the brain has a network that together serves to identify in the environment what stimuli are potentially sexual stimuli," explains Dr. Cantor. "The research seems to suggest that there is a problem in the wiring of the brain of a pedophile. There is something wrong with the way that circuitry connects the sexually responsive parts of the brain."

In 2008, Dr. Cantor has received a \$1 million operating grant to expand his research program from the Canadian Institutes for Health Research (CIHR). His team will be repeating the MRI scans from his previous study, but will also be using two newer MRI technologies: diffusion tensor imaging (DTI) and magnetization transfer.

These two cutting edge MRI technologies will give more specialized and focused information about white matter that Dr. Cantor says isn't captured by the regular MRI.

"My greatest hope for this line of research is to give us an idea of how and when to engage in the primary prevention of pedophilia," says Dr. Cantor. "If we can figure out why someone has a sexual attraction to children, we can figure out a way to remove the motivation a person may have to commit a sexual offense against a child."

While Dr. Cantor's research suggests early brain development may be the key to what makes a person a

pedophile, it is too early in the research to pinpoint when before birth or what before birth caused the neurological variance.

"It could be something as simple as poor prenatal nutrition, or some toxin in the environment, or the mother may have been exposed to some sort of virus that interferes with normal and optimal fetal growth in the womb," says Dr. Cantor. "It's too early to rule anything out, but it seems there is something in the wiring of the brain that causes the behaviour, along with the development of certain physical and intellectual characteristics like being left-handed and having a low IQ."

Dr. Cantor is quick to point out that there is nothing in his research to suggest there is a magic pill or therapy that will turn a pedophile into a non-pedophile, but it does underscore the types of treatments that are probably most effective are those that involve medications to dial down the sex drive and counseling techniques to teach pedophiles to manage their sexual interests and exercise self-control.

"The MRI scans suggest early brain development may be the key to what makes a person a pedophile, but despite the biological link, there is nothing in this research to suggest that pedophiles are not responsible for their actions," says Dr. Cantor. "I think the strongest implications of these findings is that we need to do everything we can to help people control their own behaviours." •

## « La violente » suite de la page 6

Depuis, son laboratoire a reçu des fonds de la U.S. National Institutes of Health pour poursuivre cette recherche. L'objectif : réintroduire dans les souris les mutations trouvées dans des personnes atteintes de la maladie bipolaire pour voir si les souris développeront un trouble bipolaire semblable.

La docteure Simpson espère que ses découvertes ouvriront une voie potentielle à la mise au point d'un traitement amélioré pour les personnes atteintes de maladies mentales. « Mieux vous comprenez la biologie naturelle d'une maladie, plus vous êtes en mesure de trouver des façons de la traiter – en développant de meilleurs médicaments ou par le

dépistage des facteurs génétiques du risque. »

Avec une subvention de 10,2 millions de dollars de Génome Canada, la docteure Simpson est en voie de dresser la carte complète des racines neurobiologiques des troubles du cerveau les plus sérieux. « Il se peut que plusieurs maladies mentales soient causées par des problèmes de développement des cellules souches, » conclut-elle. « Je crois que la thérapie génétique constitue un nouvel horizon pour les maladies mentales. Certes, ce n'est pas pour demain, mais en axant nos traitements des troubles du cerveau sur la thérapie génétique, nous ouvrirons une grande et nouvelle porte thérapeutique. » •

## «Fierce» mice continued from p 6

Dr. Simpson hopes her findings will translate into better treatment for people with mental illness. "The better you understand the natural biology of a disease, the better you are able to think of ways to treat it – like developing new and better drugs or screening for genetic risk factors," she says.

With a \$10.2 million grant from Genome Canada, Dr. Simpson is on

course to help map out the neurobiological roots of some devastating brain disorders. "It may be that many mental illnesses occur due to problems with stem cell development," says Dr. Simpson. "I think gene therapy is a new horizon for mental illnesses. "I think it's still quite far away, but by moving towards stem cell gene-based therapy for brain disorders we are opening a huge new therapeutic door." •