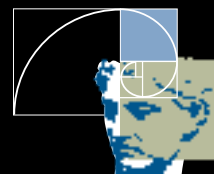




brainpower

MONTREAL NEUROLOGICAL INSTITUTE AND HOSPITAL



MONTREAL
NEUROLOGICAL
INSTITUTE
AND HOSPITAL
McGill University

“Over the past two hundred years, virtually all clinical advances have stemmed from original observations made at the research bench.”

David R. Colman, PhD
Director, MNI



why research?

High above Montreal stands one of the Canadian Government's national Centres of Excellence in Commercialization and Research: a brain research centre that celebrated neurologist Oliver Sacks has called “our Mecca.”

a unique institution

For over 70 years, the Montreal Neurological Institute and Hospital (MNI) has been a magnet for genius, starting with founder Wilder Penfield – who gave the world the revolutionary “Montreal procedure” for treating epilepsy – and going on to include a record number of Canadian Medical Hall of Fame honourees. We continue to break new ground today: scientists at the McConnell Brain Imaging Centre can catch a passing thought onscreen, and nanotechnology is opening possibilities that are larger than life.

Wired for collaboration with the best institutions worldwide, we make the connections that expand human potential. Whether you're a young man with a spinal cord injury or a woman at risk for stroke, the MNI offers the comfort of up-to-the-minute brain medicine. And we're building tomorrow's brain trust through McGill University's neuroscience graduate program, one of the largest and most diverse in the world. Read on to discover the MNI: a caring community at the height of insight.


neuroscience =

The final frontier

There are more connections in the brain than there are stars in the sky – and we're just beginning to discover how they work together to make us who we are.

Improving quality of life

We do the research that will put a stop to the brain disorders that affect half of all Canadian families: stroke, migraines, multiple sclerosis, brain tumours, Parkinson's, epilepsy and more.



welcome to the mecca of the
mind

The synapse: the tiny gap that separates neurons.
Information crosses from brain cell to brain cell by means
of specialized molecules called neurotransmitters.



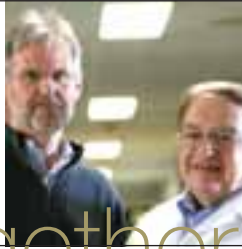
new light on science's

final frontier

Three-dimensional representation of the brain's surface, produced from magnetic resonance images at the MNI.

“Our partnership embodies the collaborative essence of the MNI. Better basic knowledge of neuromuscular diseases means better diagnosis and treatment for patients.”

Eric Shoubridge, PhD & George Karpati, OC, CQ, MD
Scientist/Clinician team



working together



Science is teamwork. It's wonderful to be at the MNI, working with young people and experiencing the incredible changes in technology and how these have affected the way we think and do science. I can remember the first time we got an MRI and I looked at those images, and it was almost like looking at a pathological specimen, but it was a living human brain – it was really beautiful.”

Brenda Milner, CC, OQ, ScD, PhD
Pioneering MNI scientist

understanding the healthy brain

To imagine the challenge of studying the brain – “the most complex machine in the Universe,” according to Isaac Asimov – try picturing a puzzle with more parts than you could count in 3,000 years. This Herculean task is precisely what inspires our team at the MNI, because every step forward brings us closer to understanding ourselves.

“Cognitive neuroscience,” the field that explores how thoughts and memories emerge from the recesses of the brain, was pioneered by Brenda Milner in the 1950s – right here at the MNI. As the best minds in the world gravitated around her, we have zoomed in from the mental processes of healthy subjects to the flutter of electrochemical impulses within single cells. We are now unlocking subsystems that deal with nerve cell communication, vision, music, and much more. We are leading an international initiative to chart childhood brain development, which promises unheard-of mastery over disabilities like autism and multiple sclerosis. At the MNI, we bring together the expertise needed to assemble the full picture of the human brain, in all its mystery and wonder.

An estimated 1/5 of human genes are expressed only in the brain.

Roughly 100,000,000,000 neurons make up the brain – and there are as many as 1,000,000,000,000,000 electrical connections between them.

They perform the equivalent of 100,000,000,000,000 calculations per second – all on the power of a single energy-efficient light bulb!

“Neurological conditions are what medicine has yet to solve. The MNI has the ability to do that better than anyplace in the world.”

Angela Genge, MD
Director, Clinical Research Unit

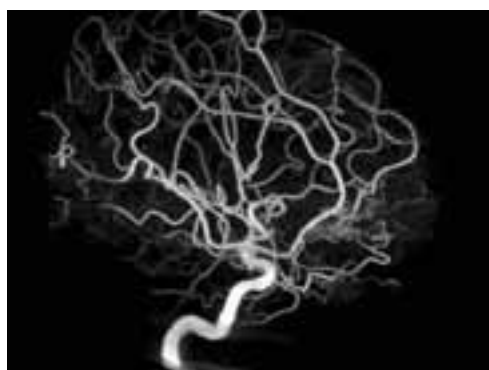


fasttracking care

brain repair and biotech

MNI scientists love their work: turning science fiction into life-giving reality. Therapeutic techniques that were unimaginable before the new century are coming within the reach of your loved ones, whether young or old.

Advances in gene therapy are bringing down obstacles to the treatment of muscular dystrophy. Multiple sclerosis can be detected earlier, which is opening new opportunities for a cure. Patients at risk for stroke or other vascular problems used to be hospitalized for weeks; today they can be discharged in a single afternoon. We're also hard at work using and developing deep-brain stimulators that improve the life of patients with Parkinson's disease.



Three-dimensional reconstruction of blood vessels in the brain produced by the MNI's biplanar angiogram, which fuses magnetic resonance images.

Looking ahead, restoring the use of paralyzed limbs or lost senses won't be beyond the reach of the MNI for long: connecting nervous tissue to man-made materials is an exciting new possibility, with the potential to drastically improve outcomes for patients with spinal cord injury, brain trauma, lost limbs and more.

“Dr. Tampieri told a dear friend of mine she would work miracles with this new technology. Little did my friend know that I would be one of the miracles.”

Donatella Tampieri, MD
Director, Neuroradiology

Roma Michailuk
Patient



the science of miracles



forging ahead: building tomorrow's

quality of life

Brain signals travel at 360 km/h – and
our life-improving research keeps pace.
At the MNI, grey matters.

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