

2020,
MEET 20
REASONS
TO HAVE
HOPE
FOR 2021.



INTRODUCING 20 AMAZING CANADIANS TAKING US INTO THE GREAT UNKNOWN. THE BRAIN.

For more than two decades Brain Canada has championed **paradigm-changing research**. We play a unique and invaluable role as the national convener of the brain research community, driving innovation and connectivity by building a truly interdisciplinary commitment to brain health. We have to. Brain disorders are among the leading causes of disability in our country and a huge public health burden. We have to invest now. Brain Canada does that by funding high-potential ideas at a critical point in a scientist's career: the beginning.

Meet the Azrieli Future Leaders in Canadian Brain Research. The next generation of brain researchers has enormous potential. They are embarking on their careers just as science and technology is unlocking the mysteries of the brain. To supercharge their efforts the Azrieli Foundation is providing critical financial support to address the funding gap for our brightest early-career investigators. Together, we're establishing Canada's pipeline of future leaders and catalyzing innovation. Here, a small peek into the lives and minds of some of our highly accomplished researchers. They make us proud and give us hope going forward.

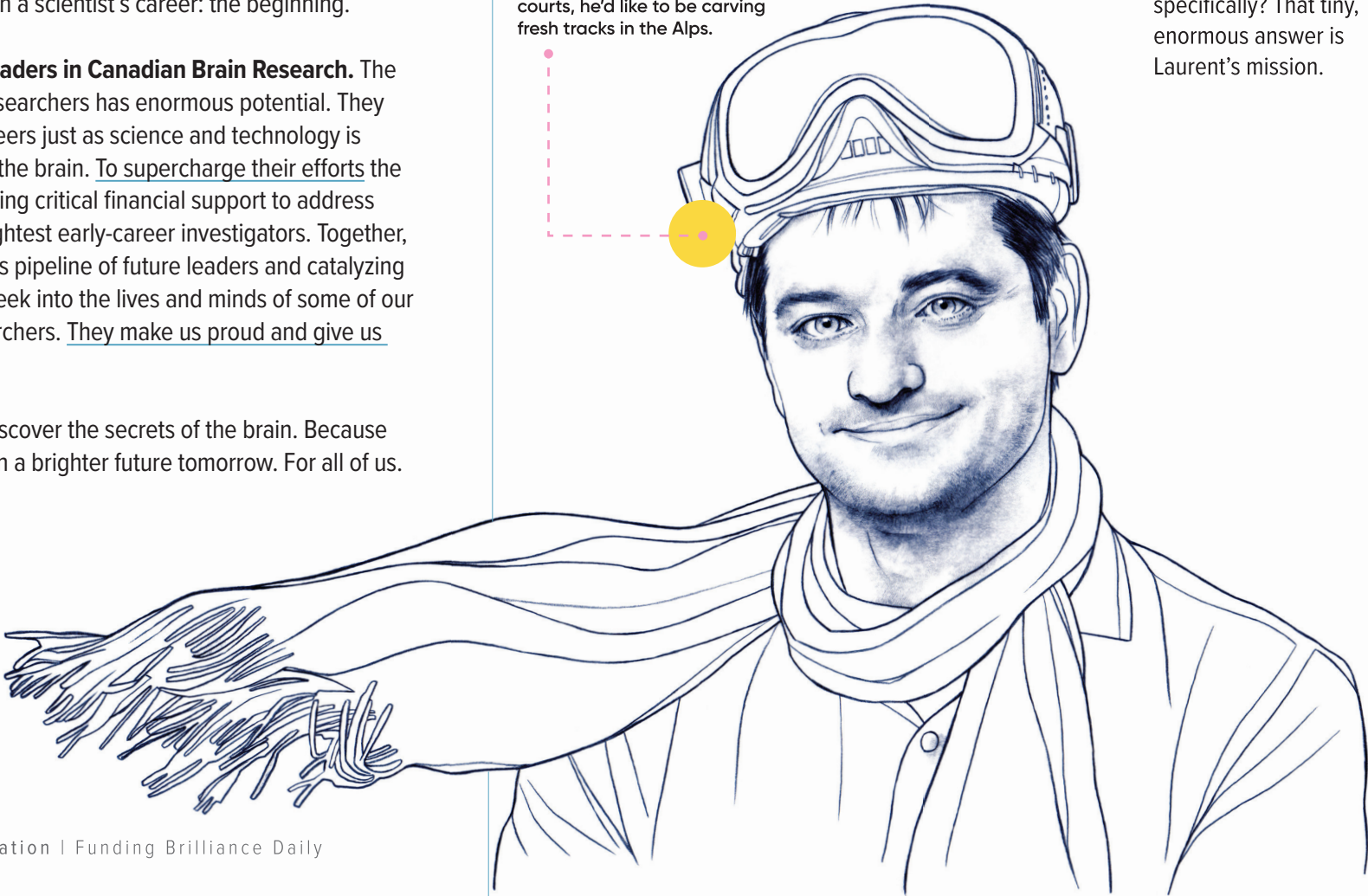
Join us as we help them discover the secrets of the brain. Because what we do today will mean a brighter future tomorrow. For all of us.

Laurent Chatel-Chaix, PhD

LOOKING FOR THE 'EUREKA' MOMENT THAT WILL STOP ZIKA.

Laurent was born in France and lives in Quebec. When he's not in the lab or on the tennis courts, he'd like to be carving fresh tracks in the Alps.

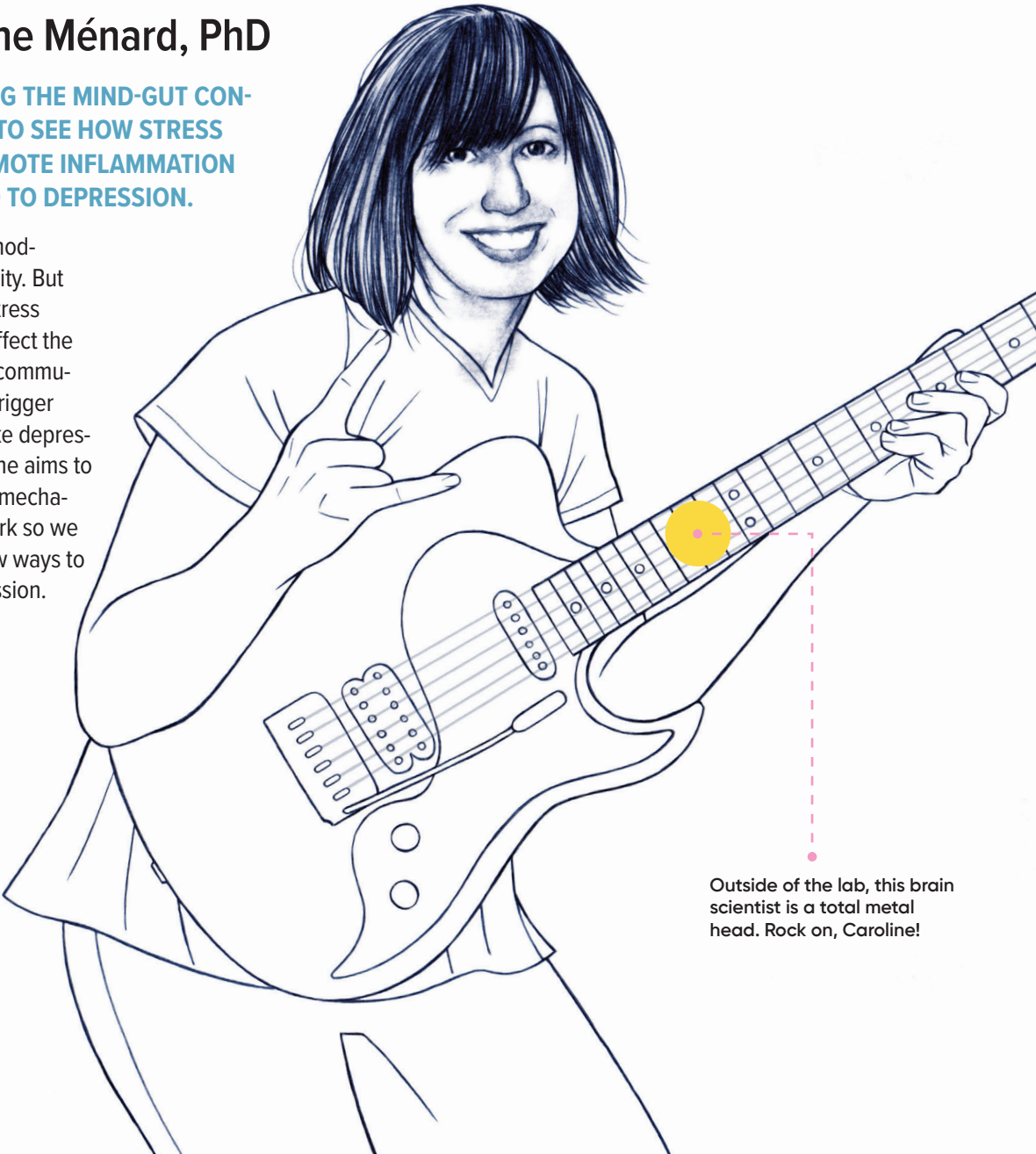
To unlock huge discoveries, molecular biology studies life at the smallest scale. How does Zika virus manage to attack the fetus brain specifically? That tiny, enormous answer is Laurent's mission.



Caroline Ménard, PhD

EXPLORING THE MIND-GUT CONNECTION TO SEE HOW STRESS CAN PROMOTE INFLAMMATION AND LEAD TO DEPRESSION.

Stress is a modern-day reality. But how does stress physically affect the brain-body communication to trigger disorders like depression? Caroline aims to identify the mechanisms at work so we can find new ways to treat depression.



Outside of the lab, this brain scientist is a total metal head. Rock on, Caroline!

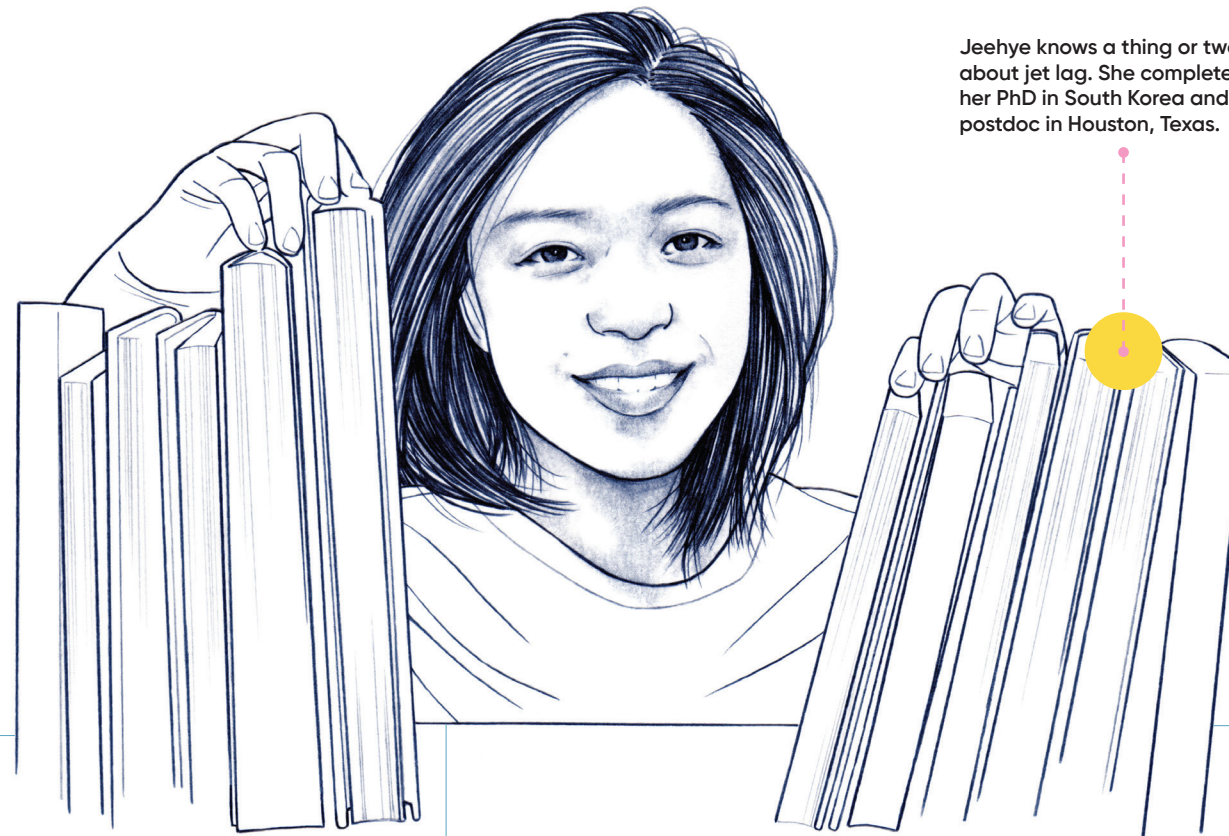


Boris Bernhardt, PhD

HELPING US SEE AUTISM SPECTRUM DISORDER LIKE NEVER BEFORE.

Autism remains a mystery: hard to detect and treat. Boris harnesses powerful computer models to study the wiring between cortical areas in hundreds of brain scans. These findings are cross-examined with behavioral and genetic data which may finally crack the code.

This techno-loving dad runs almost every day.

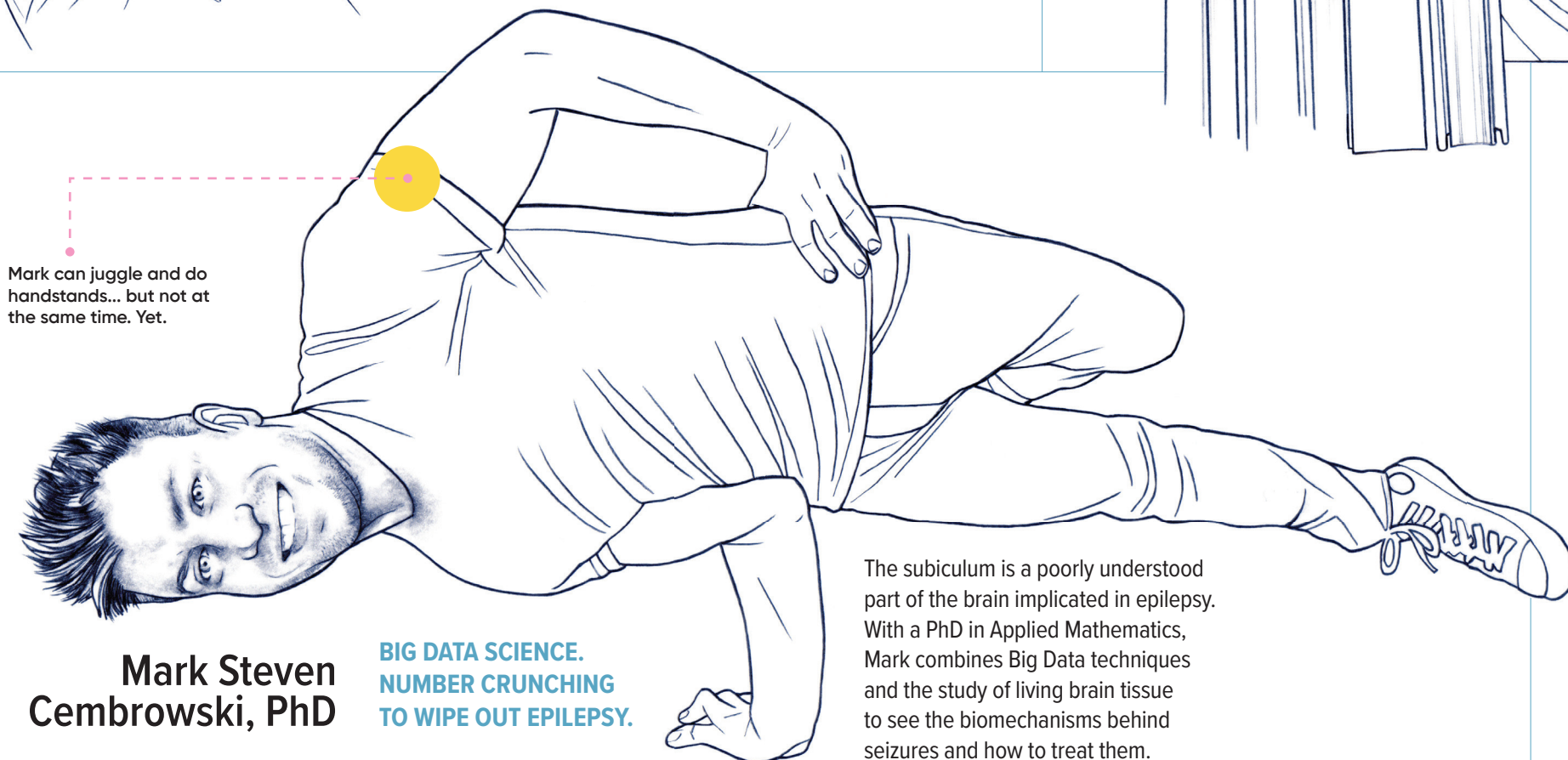


Jeehye knows a thing or two about jet lag. She completed her PhD in South Korea and a postdoc in Houston, Texas.

Jeehye Park, PhD

HOW DOES ALS WORK TO MAKE OUR NEURONS NOT WORK? THAT IS JEEHYE'S WORK.

Amyotrophic Lateral Sclerosis (ALS, also known as Lou Gehrig's disease) is a motor neuron breakdown. How does the breakdown work at the molecular level? Jeehye combines biochemistry, molecular cell biology, mouse and fruit fly genetics to unlock answers that advance our understanding of ALS and other neurodegenerative diseases.



Mark can juggle and do handstands... but not at the same time. Yet.

Mark Steven Cembrowski, PhD

BIG DATA SCIENCE. NUMBER CRUNCHING TO WIPE OUT EPILEPSY.

The subiculum is a poorly understood part of the brain implicated in epilepsy. With a PhD in Applied Mathematics, Mark combines Big Data techniques and the study of living brain tissue to see the biomechanisms behind seizures and how to treat them.

Mark Brandon, PhD

POWERFUL NEW TECHNOLOGIES TO UNDERSTAND OUR MOST POWERFUL MEMORIES.

How can a song, picture or smell trigger powerful memories? Mark uses and develops new tools to study the activity and wiring in the brain responsible for our vivid recollections. His work helps us better understand how the brain forms new memories and why these memories are disrupted by Alzheimer's disease.

Mark's most vivid memories are from his childhood playing hockey in his local youth league in the U.S. No wonder he moved to Canada!



Sara Tremblay, PhD

THE NEXT WAVE IN DEPRESSION TREATMENT IS LITERALLY WAVES.

Treatment of depression often involves medication and/or other therapeutic supports. Sara pioneers drug-free, non-invasive treatments using Theta Burst Stimulation. This brain-boosting technique shows a lot of promise.

Sara has a secret love of spicy foods.

Growing up, Michael didn't even know neuroscience was a thing until university.

Michael Mack, PhD

HE STUDIES BRAINS, TO HELP THEM STUDY BETTER.

Young people learn differently because every brain works differently. Michael's research combines learning experiments with neuroimaging. He dreams of customized learning that makes the most of every student's brain.

Robert Laprairie, PhD

CANNABIS IS LEGAL, BUT WE NEED BETTER INFORMATION ON ITS IMPACT.

Many cannabis devotees claim it can reduce nausea during pregnancy with no side-effects to the fetus. Robert's work with pregnant rats studies how cannabis alters brain development, so parents-to-be can make informed choices.

Robert is a Doctor of Pharmacology, but his early schooling was in the fine arts, including ballet.

Marco Gallo, PhD

IMAGINE FINDING A SWITCH THAT TURNS OFF PEDIATRIC BRAIN CANCER ONCE AND FOR ALL.

Childhood gliomas are unusual brain tumors. When you look at their genes, they often don't even have the expected cancer mutations. Marco is on the hunt for hidden gene switches that trigger these pediatric cancers.

This Calgarian may look like a bearded cowboy, but he was born in Northern Italy.

Jo Anne Stratton, PhD

THIS CELLULAR DETECTIVE IS HUNTING DOWN THE MS MOLECULE.

In people with Multiple Sclerosis, immune cells cross the brain barrier, triggering inflammation and damaging brain tissue. Jo Anne's work looks at these inflammation-causing molecules to learn how they get into the brain and cause damage.

Jo Anne is a triple citizen of Canada, Australia and the UK.

When Allen gets up from his lab desk, or from reading the latest sci-fi book, he is surprisingly tall.



Allen W. Chan, PhD

UNDERSTANDING AUTISM. UNIFYING OUR BRAIN PARTS, PROGRAMMING AND PERSONALITY.

Is the mind a huge and complex system of switches and wires? Or is the mind all of the behaviours travelling through it? Allen says yes and yes, in his search for the next generation of treatments for Autism Spectrum Disorder (ASD).

Ravi got way, way out of the lab for three months, hiking and kayaking through remote Patagonia.

Yasser Iturria Medina, PhD

YOUR BRAIN IS AS DISTINCT AS YOUR FINGERPRINT. IMAGINE PERSONALIZED MEDICINE THAT PRECISE.

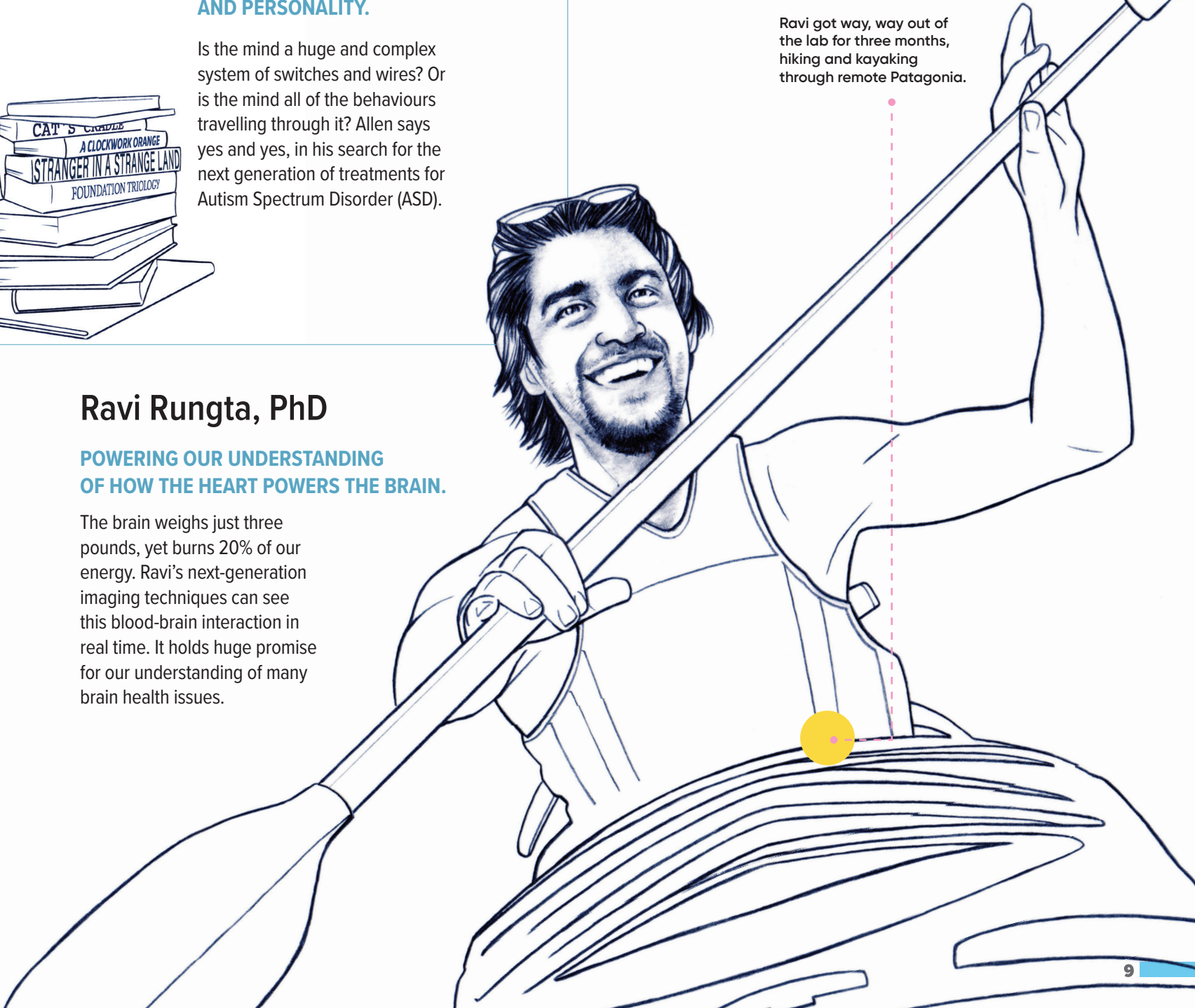
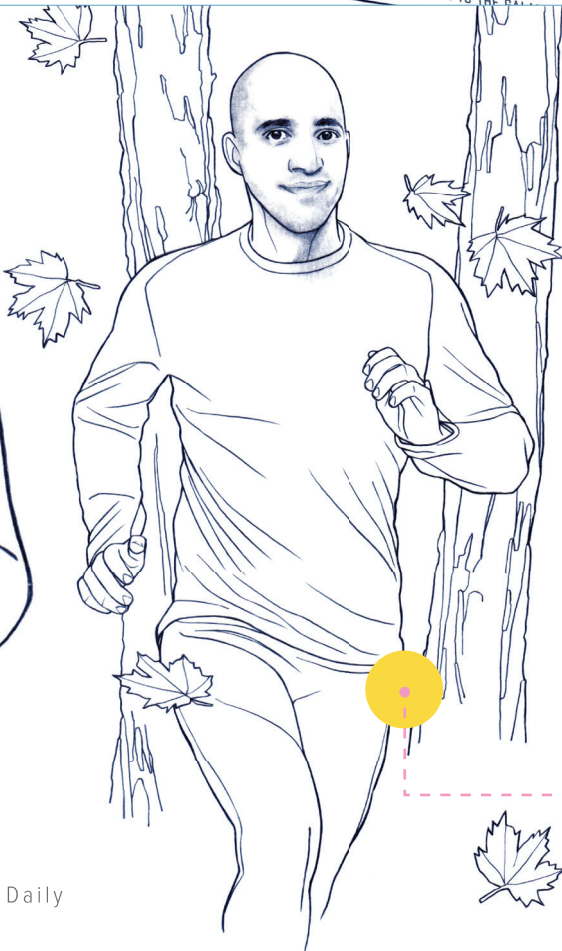
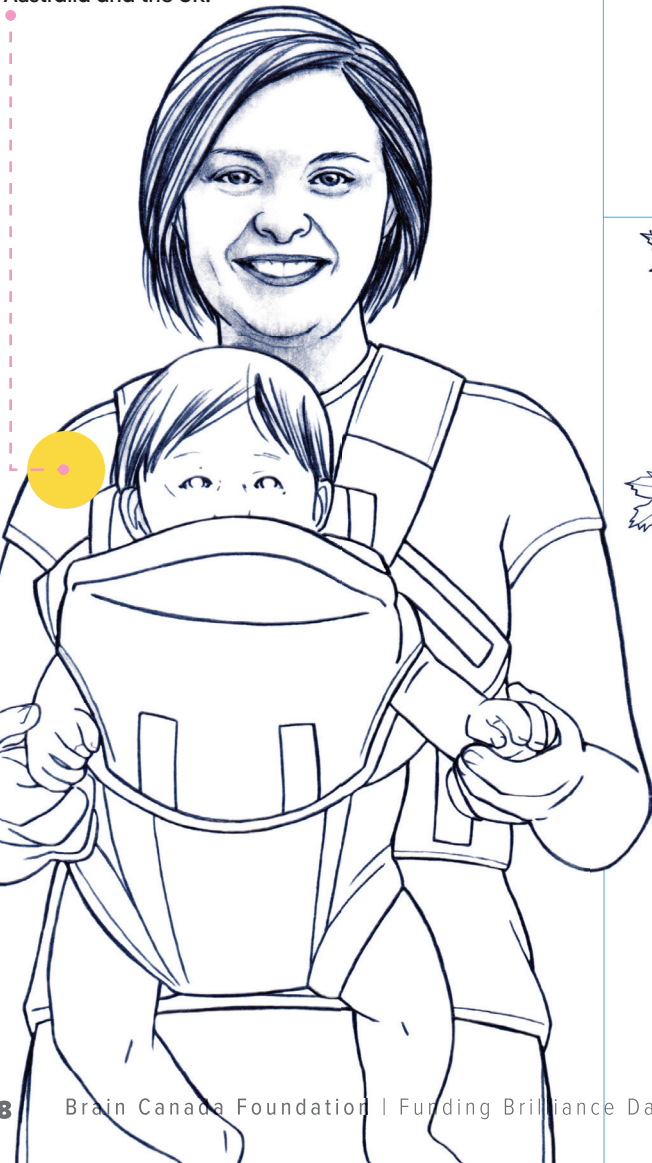
Every brain is unique. That's why Yasser believes every brain deserves distinctive treatment. Thanks to the cutting-edge science of Neuroinformatics, it's becoming a reality. Microscopic imagery meets massive data analysis for personalized therapy.

To give his brain exactly what it needs, Yasser regularly takes long runs in the woods.

Ravi Rungta, PhD

POWERING OUR UNDERSTANDING OF HOW THE HEART POWERS THE BRAIN.

The brain weighs just three pounds, yet burns 20% of our energy. Ravi's next-generation imaging techniques can see this blood-brain interaction in real time. It holds huge promise for our understanding of many brain health issues.

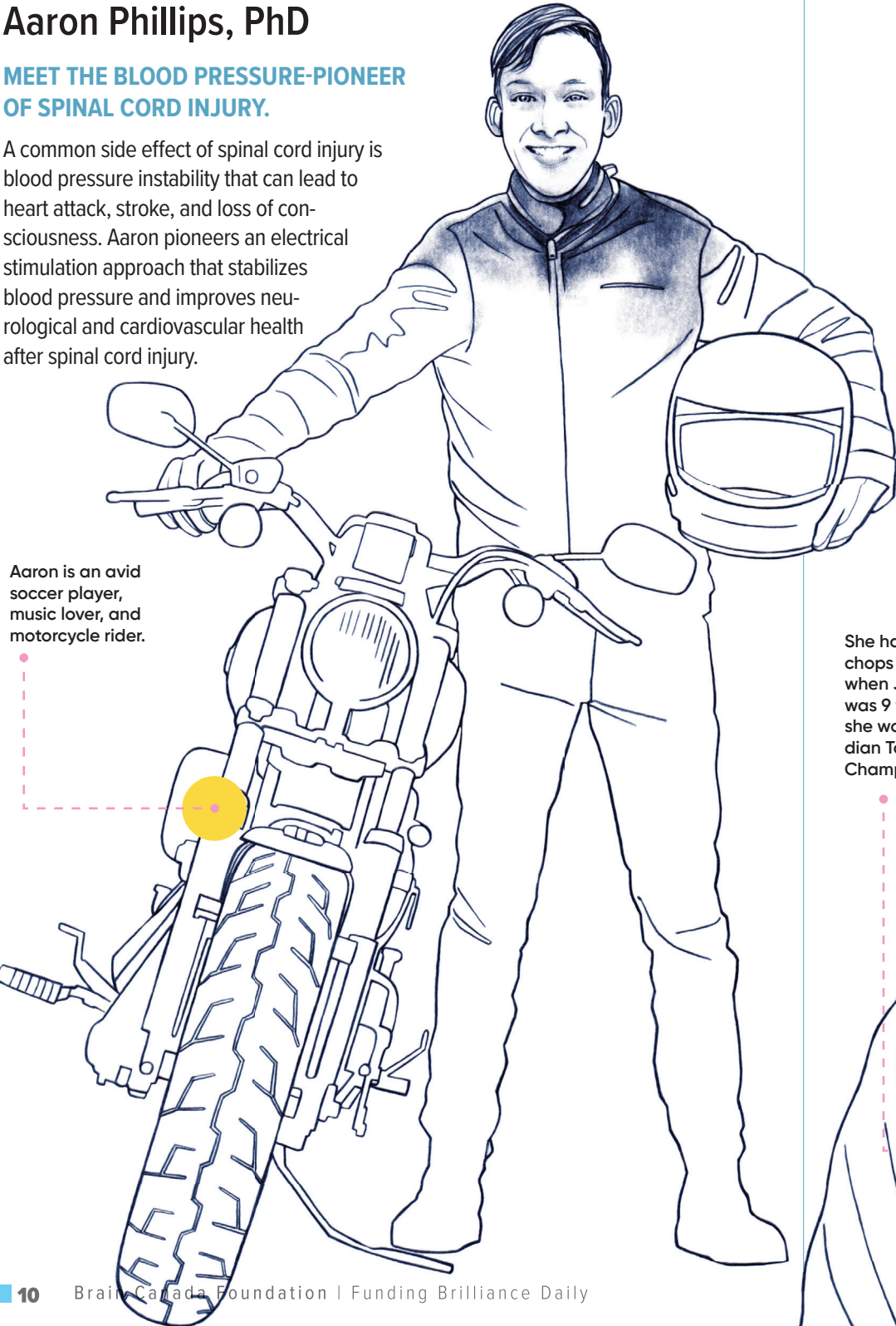


Aaron Phillips, PhD

MEET THE BLOOD PRESSURE-PIONEER OF SPINAL CORD INJURY.

A common side effect of spinal cord injury is blood pressure instability that can lead to heart attack, stroke, and loss of consciousness. Aaron pioneers an electrical stimulation approach that stabilizes blood pressure and improves neurological and cardiovascular health after spinal cord injury.

Aaron is an avid soccer player, music lover, and motorcycle rider.

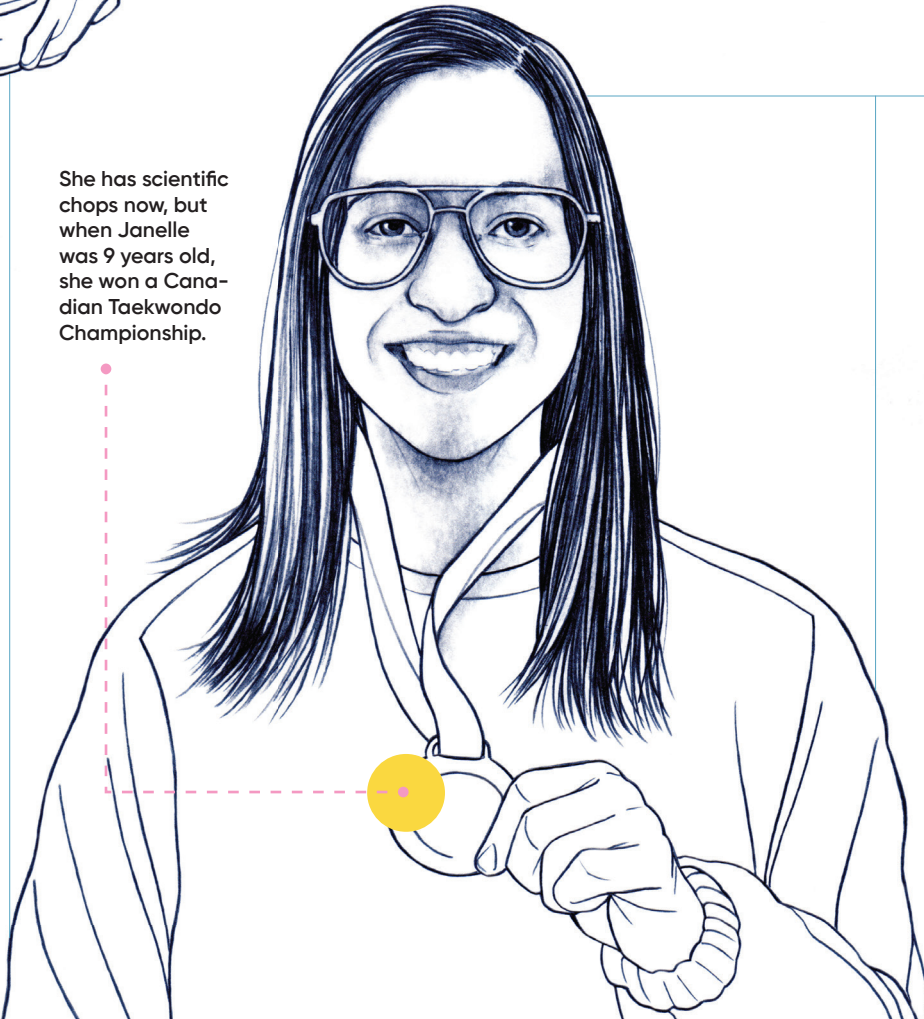


Janelle Drouin-Ouellet, PhD

THE INNOVATIVE RESEARCH TECHNIQUE THAT COULD MAKE PARKINSON'S HISTORY.

Janelle uses an exciting technique to take skin cells from seniors with Parkinson's and turns them into brain cells. Then she studies the effects of aging to see how the brain cells break down. She is thinking out-of-the-box to expand our knowledge and test new therapies.

She has scientific chops now, but when Janelle was 9 years old, she won a Canadian Taekwondo Championship.



Christian Ethier, PhD

BIO-CIRCUITRY THAT WILL BOOST THE BRAIN'S ABILITY TO HEAL.

Meet the Electrical Engineer who became a Brain Repair scientist. Christian's research program studies how stimulating neurons can fix a brain's motor function so people can regain their mobility.

Christian learned his surgical skills while gutting fish.

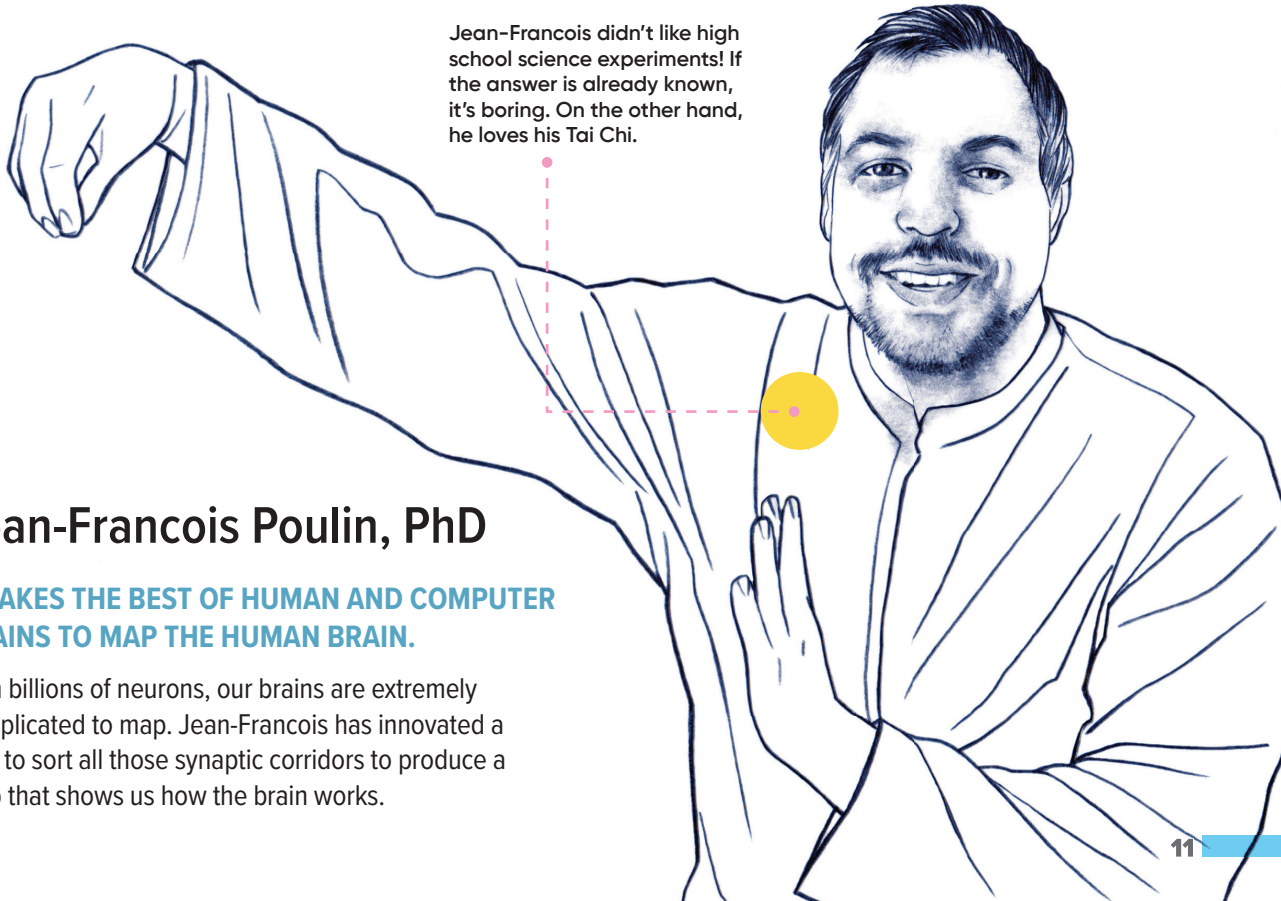


Jean-Francois didn't like high school science experiments! If the answer is already known, it's boring. On the other hand, he loves his Tai Chi.

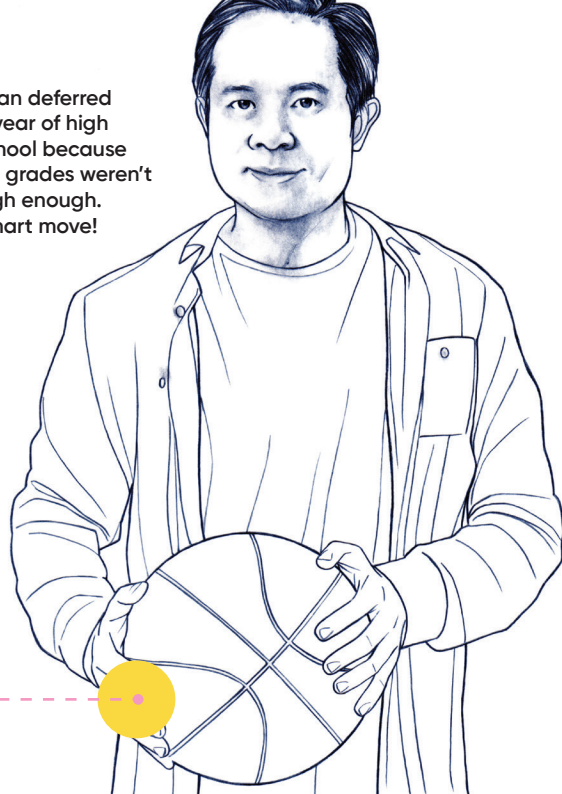
Jean-Francois Poulin, PhD

IT TAKES THE BEST OF HUMAN AND COMPUTER BRAINS TO MAP THE HUMAN BRAIN.

With billions of neurons, our brains are extremely complicated to map. Jean-Francois has innovated a way to sort all those synaptic corridors to produce a map that shows us how the brain works.



Ryan deferred a year of high school because his grades weren't high enough. Smart move!



Ryan Yuen, PhD

GENETIC MUTATIONS CAUSING AUTISM ARE ELUSIVE, THEY HIDE IN DIFFERENT AREAS OF DNA IN DIFFERENT PEOPLE.

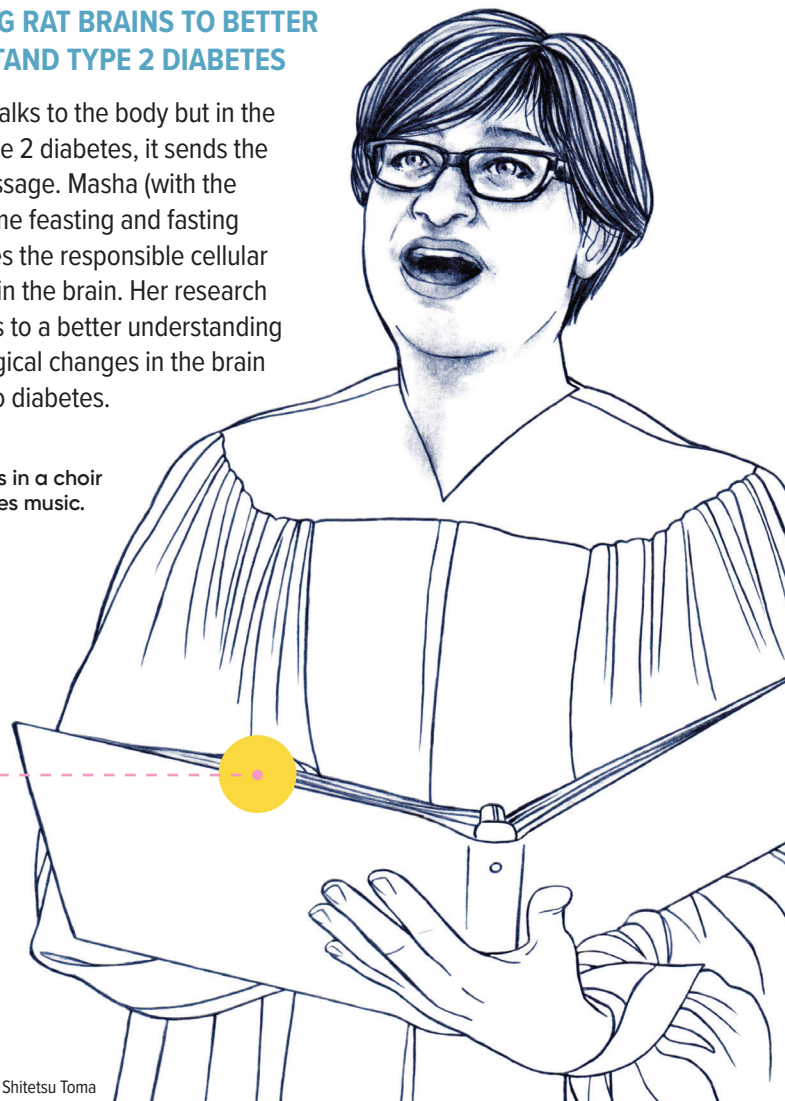
Genetic testing can identify many genetic disorders in children, yet Autism Spectrum Disorder (ASD) remains notoriously hard to detect, because the relevant genetic mutations are scattered throughout the DNA. Ryan is using a new detection strategy to find these mutations.

Masha Prager-Khoutorsky, PhD

STUDYING RAT BRAINS TO BETTER UNDERSTAND TYPE 2 DIABETES

The brain talks to the body but in the case of type 2 diabetes, it sends the wrong message. Masha (with the help of some feasting and fasting rats) studies the responsible cellular structures in the brain. Her research contributes to a better understanding of pathological changes in the brain that lead to diabetes.

Masha sings in a choir and arranges music.



Illustrations by André Shitetsu Toma

This project has been made possible with the financial support of Health Canada, through the Canada Brain Research Fund, an innovative partnership between the Government of Canada (through Health Canada) and Brain Canada, and the Azrieli Foundation. The views expressed herein do not necessarily represent the views of Health Canada.