



Dr. Serge Rivest: revolutionizing Alzheimer's treatment

The work of Dr. Serge Rivest and his Quebec City-based team, particularly their discovery of a cell that acts as a natural immune system "soldier", promises to revolutionize Alzheimer's treatment and slow the disease's progression.

- » 1990: Ph.D. in physiology/endocrinology, Laval University
- » 1993: completed post-doctoral studies at the Salk Institute, San Diego, California
- » 2001: appointed professor, Faculty of Medicine, Laval University
- » 2001: Canada Research Chair in Neuroimmunology
- » 2006: recipient, Discovery Award, Quebec *Science magazine*

"I never thought we'd be on the verge of controlling the progression of Alzheimer's disease in my lifetime. But following the discoveries made by our team and by other researchers around the world, it looks as if success is within reach, perhaps just a few years away," says Dr. Serge Rivest proudly. Appointed professor in Laval University's Faculty of Medicine in 2001 and associated with the Laval University Research Centre (CHUL), Dr. Rivest also holds a Canada Research Chair in Neuroimmunology.

Attracted by its competitive and performance-driven work environment, particularly in the biomedical field, Dr. Rivest decided to make Quebec City his home in early 2000. "I've received offers [from other places], but researchers in Quebec City have a number of advantages," he explains. "I adore it here, just like I love CHUL and the team I work with."

Among their numerous achievements, Dr. Rivest and his team of experienced researchers, all based in Quebec City, challenged a well-established scientific theory. Many researchers had erroneously believed that microglia – octopus-shaped immune defence cells – caused central nervous system inflammation and were thus responsible for killing neurons. Anti-inflammatory drugs were often prescribed to counter their supposed effects.

However, while exploring new avenues, Dr. Rivest and his team, with financial support from the Canadian Institutes for Health Research, demonstrated that the opposite was true. In fact, microglia are part of the solution, not the problem! The team observed that microglia derived from bone marrow stem cells are effective against amyloids – toxic proteins that accumulate in the brain cells of Alzheimer's patients. Thanks to this groundbreaking research, in the not-too-distant future it may be possible to stabilize patients during the early stages of the disease.

This extraordinary discovery led to widespread international recognition, including front-page coverage in several scientific journals. Dr. Rivest's team created its first stir several years ago when it demonstrated that the brain has its own immune system – another made-in-Quebec-City discovery!

Innovative approach

Building on its achievements, the team has developed an innovative therapeutic approach, based on cellular genetics, in which stem cells are transformed into “super soldiers.” The next step will be to obtain the necessary authorizations to carry out tests on Alzheimer's patients.

“This is the future of medicine,” says Dr. Rivest, who is confident that the team's findings can be applied to other diseases caused by the build-up of toxic proteins.

As someone who has consistently resisted prevailing trends, Dr. Rivest believes that a good researcher should keep an open mind, even if results turn out differently than expected. “Just because we have trouble understanding certain things doesn't mean they're insignificant,” he notes. He also believes that a major battle in the war against Alzheimer's has been won.

“If we don't find an effective treatment soon, over 20 million people in North America will have Alzheimer's by 2050,” he notes. “If their condition can at least be stabilized, we'll end up saving billions of dollars in healthcare costs while bringing great relief to patients and their families.”

From sports to science

At the outset, Dr. Rivest didn't seem destined for a research career. As a sports-loving hockey player from Abitibi, he thought of becoming a physical education teacher. His focus changed during his bachelor's studies, however, when he developed an abiding interest in science.

Specializing in nervous system immune response and the phenomenon of anorexia, he received his Ph.D. in physiology/endocrinology from Laval University. He subsequently relocated to California for a program of post-doctoral studies at the San Diego-based Salk Institute, founded by polio vaccine discoverer Jonas Salk.

In San Diego, Dr. Rivest had an opportunity to meet with a number of leading scientists and Nobel Prize winners, from whom he continues to draw inspiration.

