

Bringing Research to LIFE

Upcoming Events

Visionary Conversations

Global Pandemic: Another Y2K or Future Apocalypse?

Talk of the inevitability of a global pandemic abounds in popular media. Is it necessary? Are we prepared? Learn about the science behind the hype from our experts and join the discussion.

April 17

Frederic Gaspard Theatre
Basic Medical Sciences Building
Bannatyne Campus

Reception in Buhler Atrium 6:30 – 7 pm
Panel discussion 7 – 8:30 pm

Featured speakers:

Frank Plummer – Canada Research Chair in Resistance and Susceptibility to Infections, Faculty of Medicine

Michelle Driedger – Canada Research Chair in Environment and Health Risk Communication, Faculty of Medicine

Anand Kumar – Associate Professor, Medical Microbiology/Pharmacology/Internal Medicine, Faculty of Medicine

Joanne Embree – Head and Professor, Medical Microbiology and Infectious Diseases, Faculty of Medicine

RSVP to:

visionary.conversations@ad.umanitoba.ca

Visionary Conversations

Our Education System: The Good, The Bad and The Solutions

Engage with our experts as they share their perspectives on our education system and the research that shows why things must change.

May 22

Robert B. Schultz Theatre
St. John's College, Fort Garry Campus

Reception in Galleria 6:30 – 7 pm
Panel discussion 7 – 8:30 pm

Featured speakers:

Jocelyn Fournier-Gawryluk (Alumna) – President, Canadian Association of Principals

Marni Brownell – Associate Professor, Community Health Sciences/ Manitoba Centre for Health Policy, Faculty of Medicine

Marlene Atleo – Associate Professor, Educational Administration, Foundations and Psychology, Faculty of Education

Rodney Clifton – Senior Scholar and Retired Fellow, St John's College; Senior Fellow, Frontier Centre for Public Policy

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Before it's too late

Inspired by her mother, researcher takes aim at early detection of dementia

BY KATIE CHALMERS-BROOKS
For The Bulletin

Call it a daughter's intuition.

Zahra Moussavi first suspected there was something different about her mom, Soroor, when she was in Winnipeg visiting from Iran 13 years ago. But the biomedical engineer couldn't pinpoint exactly what was wrong.

She took her to a geriatrician and—during another visit a year later—to a neurologist. Both specialists insisted Soroor, who was in her late 60s, was okay. In fact, Soroor passed the conventional screening questionnaire for dementia with a perfect score.

"The doctor therefore told me that I was imagining any problem and that Mom was perfectly fine. But I was not convinced," Moussavi says.

She noticed her mother's vocabulary was narrowing. She also seemed depressed.

But it wasn't until three years later that Soroor got lost within two blocks of her own home, the first major indicator that she had Alzheimer's disease.

It was the beginning of a devastating decline. Soroor was an intelligent woman with gumption, a mother of four who married in Iran at only 15 years old but went back to school to not only get her high school diploma but—at 46—earn a university degree and do so with a 3.8 grade point average.

In the years leading up to her death three months ago, she could communicate only through gestures and had become less like an adult and more like a child, tenderly caring for a baby doll she had named Zahra.

For Moussavi, Soroor's youngest, this personal journey has morphed into a research mission. "The only way I could cope with the pain was to put my researcher cap on and look at my mom as a patient," she says.

A Canada Research Chair in Biomedical Engineering best known for her research into sleep apnea, Moussavi is going after Alzheimer's disease with equal vigour. There is no cure for this disorder but, as her investigations so far suggest, there are brain exercises and electromagnetic treatments that can reduce and delay symptoms.

In Canada, someone is diagnosed with dementia every five minutes. If doctors could detect the condition earlier, these treatments could begin sooner and potentially slow its progression. By the time a person gets to the point where they can no longer find their way home, the deterioration is too far gone for treatments to have maximum impact. "By then, it is already too late. That person is already a few years passed the onset. My goal is to detect the onset," says Moussavi.

To do so, she had to go back in time, zeroing in on those first signs she saw in her mom and making links with her growing understanding of the intricacies of the brain. Soroor would become anxious when Moussavi took a less direct route when driving home. And even though she wasn't yet getting lost, she grew increasingly concerned her family members would. Moussavi suspected egocentric orientation was involved, which is how our brains



Photo By Katie Chalmers-Brooks

Prof. Zahra Moussavi, director of the U of M's Biomedical Engineering program

navigate a space when we don't have familiar landmarks to rely on.

So she designed an interactive computer game to measure this ability, which she likens to having an internal compass. "What I'm claiming is that it is the egocentric orientation that is being deteriorated first by aging and much more significantly by Alzheimer's, before any other symptoms appear."

The way she tests this theory has evolved over time. Now, study participants either sit in a wheelchair or push a wheelchair as they navigate their way through a virtual building that appears on a computer screen in front of them. Her findings so far—involving 50 people across different age groups, from young adults to seniors—confirms that our egocentric orientation capability grows during our youth and deteriorates later in life. Participants who were eventually diagnosed with dementia did in fact have particularly low scores, well below the average for healthy individuals. "I believe with this simple technology, we can predict Alzheimer's at the very early onset," Moussavi says.

She is also confident we can lessen its impact once it takes hold. Moussavi is one of only a few researchers in the world using repetitive Transcranial Magnetic Stimulus (rTMS), a new technology used to activate neurons by holding a magnetic coil over the head that sends electromagnetic pulses to the brain. She is using this technique on an 85-year-old woman with Alzheimer's who, after 10 days of rTMS treatment sessions, now remembers her children, her grandchildren and even their names. "We

have seen some improvement, which is very encouraging," Moussavi says.

In another pilot study, just over a dozen people age 70 and up benefitted from doing simple brain exercises over two months. "Their memory improvement was quite remarkable," Moussavi says. "We didn't know it at the beginning but two of those individuals were at the earliest stages of dementia. Even those two, as long as they were doing the exercises, showed improvement."

When they stopped, the two individuals with dementia declined significantly. "Although it's not a scientific conclusion yet, what (these findings) imply is that there was hope as long as these people were doing the exercises."

Moussavi will present these results at an upcoming psychiatry conference in France.

She too exercises her brain, knowing she may have a genetic predisposition for developing Alzheimer's. "It's my worst fear," the scientist says.

She regrets that it's too late for her research to help her mom. But she's reassured that the woman who taught her so much in life knew the significance of her final lesson. Before presenting at a university in her home country in December, Moussavi shared a poignant moment with her mom.

"I told her 'Mom, I'm going to talk about you and how much you have helped me in this research,'" she recalls. "My mom's eyes became conscious and quite alert. She had a faded smile and nodded and then kissed me. I think she understood."