

# Sprouts of HOPE

BY Nadia Moharib

## Alberta researcher and front-line doctor looks to broccoli sprouts as a possible preventer of cerebral palsy

**D**R. JEROME YAGER CAN TALK ALL SERIOUS ABOUT his research into cerebral palsy. But when his voice softens as he recalls an encounter with a blind child with an inoperable brain tumour, it offers a poignant reminder he doesn't toil in a silo.

"She put her arms out and gave me a big hug and a smile in spite of the fact she couldn't actually see us; it was comforting in the face of her discomfort," he says. "She was strong enough to still have the compassion and to be able to bring a smile to her face and comfort to others."

Dr. Yager, professor and director of research for the University of Alberta's department of pediatrics, says he is optimistic that research, albeit in the early stages, into cerebral palsy will make a difference for other children with challenges of their own.

Ideally, it will show "natural products" (broccoli sprouts), when ingested by pregnant women will prevent the condition in their children or mitigate its severity. "The research is promising," Dr. Yager says. "But I don't want people to run out and buy broccoli sprouts quite yet."

Cerebral palsy is an injury to the brain that typically results in motor deficits affecting one or both sides of the body which can lead to developmental-related issues like learning disabilities and epilepsy. In North America, it appears in two to three per 100,000 live, full-term babies – or 10 times as high in preterm babies.

In developing countries, Dr. Yager says, incidences are as much as 10 times higher.

"Fortunately, the majority of parents have their children well integrated into society, and kids with cerebral palsy continue to lead normal and near-normal lives, which is great," he says. "Our hope is to reduce the incidences and improve the outcome of children who do develop cerebral palsy."

To that end, his team is pursuing the possibility that broccoli sprouts might have merit – research done with a \$150,000 over three years grant from the Alva Foundation, a \$100,000 grant per year for five years from the National Centres of Excellence, and support from the Women and Children's Health Research Institute.

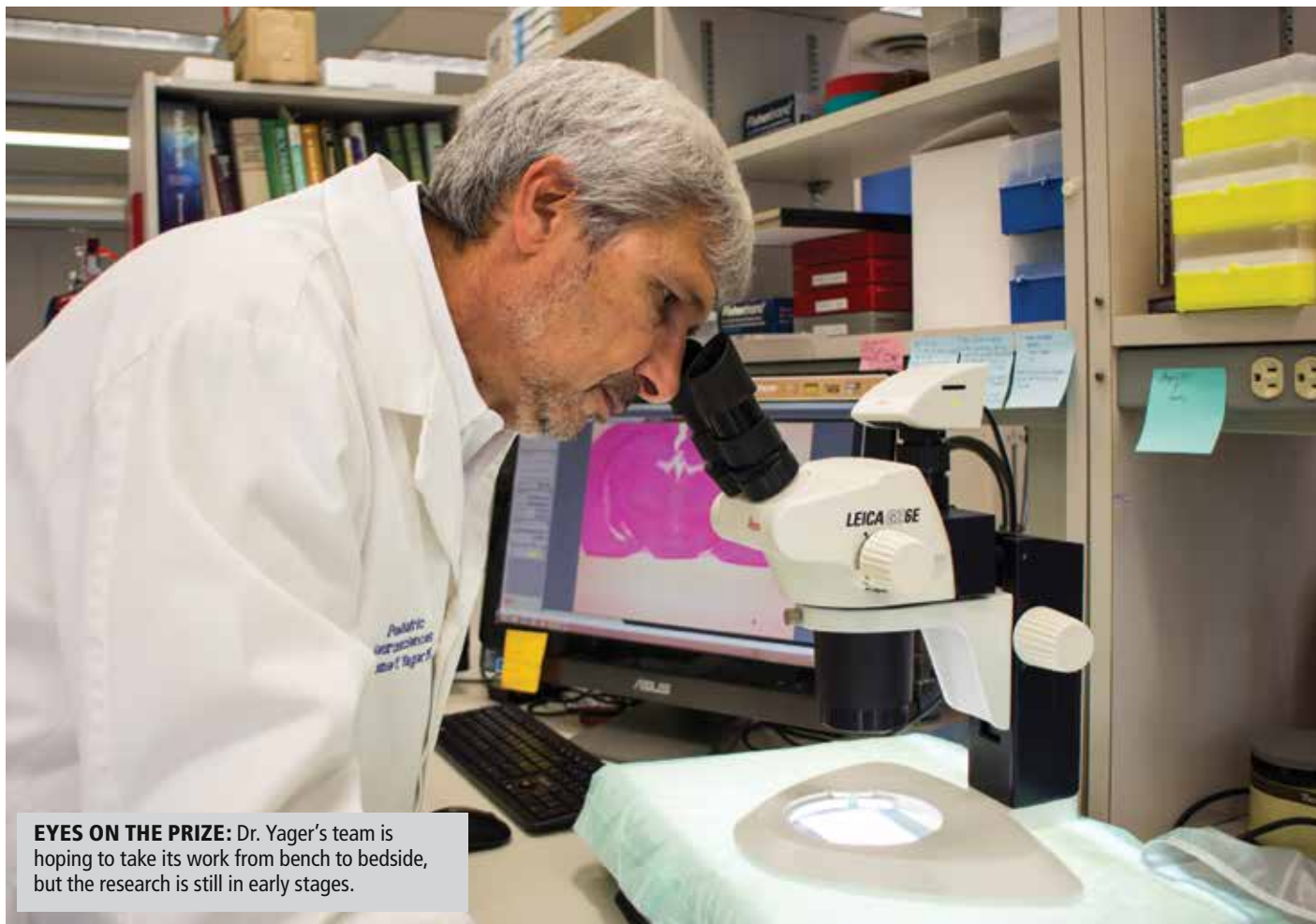
"Because it's a simple approach to a complex problem," he says. "They understand it because it's food and it's very doable in their minds."

Broccoli sprouts already have some street cred and have been looked at in cancer prevention and therapy, as well as prevention of hypertension and diabetes.

The immature sprout is a very potent anti-inflammatory and antioxidant – 50 to 100 times more effective on that front than mature broccoli, Dr. Yager says.

While there is much work being done across the country looking at the rehabilitation side, Dr. Yager says less is being done on the prevention front.





**EYES ON THE PRIZE:** Dr. Yager's team is hoping to take its work from bench to bedside, but the research is still in early stages.

Their research worked with animal models, creating conditions in Long-Evans rats which mimic similar hallmarks of cerebral palsy in humans. In one model using the rats, researchers created a reduction in blood flow from the placenta to the fetus, causing injury to the brain – not a lot unlike what would be seen in a human newborn as “a result of placental insufficiency, which is a high risk factor for cerebral palsy,” Dr. Yager says.

Once they had a newborn with mild to moderate cerebral palsy, researchers went a step further with findings showing broccoli sprouts, if ingested before the newborn arrived, were effective in preventing the injury. “This means that the use of broccoli sprouts may permanently prevent cerebral palsy in those infants at risk for this disorder,” Dr. Yager says.

The team also looked at a second risk factor for cerebral palsy in humans known as a fetal inflammatory response or an infection of the amniotic fluids. In those cases, by supplementing the diet of pregnant rats with broccoli sprouts, researchers found it prevented newborns from being small at birth as well as reduced developmental disabilities by about 60 per cent.

The hope is to take this work for ultimate use in the prevention of cerebral palsy in humans, he says. “It’s going extremely well,” a cautiously optimistic Dr. Yager adds. “Going from the bench to the bedside is always a challenge.

Dr. Yager – who finished his medical degree in 1981, specializing in

pediatrics by 1986 and two years later earning his pediatric neurology speciality – works both in the lab and as a front-line doctor. The latter, he says, is a constant reminder of the motivation behind his research.

“I really enjoy the investigative part of doing research and the finding of answers, but being with patients is really a highlight in my day,” he says. “Because of some of the difficult situations we would see with families and newborns, it gave me the drive to keep investigating and keep looking.”

He also loves working with and for children. “Even if they were not feeling well or sick ... they always have a positive outlook and see the world in a very open and honest

way,” he says. “Doing pediatrics was a much more heartfelt area for me than adult medicine – there is much more hope and much more future doing pediatrics because it’s the beginning of life, not the end of life.”

And he hopes to contribute. “Part of the reason I went into research was to add to the knowledge and innovation and progress that was clearly going to happen in brain research,” he says. “A great day is finding some very positive results in the laboratory related to therapies or improvement in outcomes, a foundation supported initiative.”

His work with children and their families is not without its rewards, either. “I love the inquisitiveness and curiosity of doing research and I love to talk to parents or the children and ... nowadays giving them a bit more hope than we were able to do 10 years ago.” 🐾

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