



Bridging medicine's great divide

Researchers at Toronto's MaRS Centre are on mission to dispense latest health-care advances from the West to the developing world

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[JUDY STEED](#)

Toronto Star reporter Judy Steed has been living on MaRS for the past month to capture some of the people, ideas and extraordinary developments in commercializing leading edge research at Toronto's MaRS Centre, which celebrates its first anniversary today.

Roaming around MaRS, you run into people.

In the elevator with Ilse Treurnicht, MaRS CEO, and John Evans, board chair, Rob Moffat raves about a MaRS workshop on "the power of pictonics."

"I've been thinking about it all weekend," says Moffat, 40, president of privately held crisis communication software maker Wallace Wireless, a tenant in the MaRS incubator. "It's about the power of visual thinking, with this guy Dave Gray" (More on Gray later.)

Off the elevator, Moffat flashes his BlackBerry and shows off Wallace's product, clicking through emergency measures procedures so complete and complex that a room at a bank, shelves lined with thick binders, was once required to store all the data.

A senior executive at Scotiabank — "our first big client," Moffat says — had observed that the binders were out-of-date and useless in an actual emergency. "If our employees had the information on their hip, they'd use it."

The light bulb went on. Moffat's partner, Gary Bauer — the code guy — came up with groundbreaking technology that could "push the content" out to a BlackBerry.

"That was back in early 2001, when BlackBerry didn't have many partners," Moffat says. "We were the first to provide emergency and continuity management `on board.' People didn't get it right away."

After 9/11, they did.

What do you do in case of fire? Explosion? Toxic spill? Lights out? How do you get money, power and communications in an emergency?

Moffat clicks through data on his BlackBerry. The universal United Nations identification symbols for toxic chemicals, poisons and antidotes pop up, with information on what to do, who to call and how to take



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the next step. Moffat and Bauer moved into MaRS last year with seven employees. Today, Wallace Wireless has 18, including the requisite "grey hair," Joe Nardi, "a Canadian software legend," in Moffat's words.

A former senior executive at business software maker Cognos Inc. in Ottawa, Nardi has "seen it all before — several times," he says with a grin.

He's helping the Wallace team "take that entrepreneurial spirit and innovation and turn it into a product that's repeatable, for the mass market."

"We're learning how to commercialize," Moffat says. "It's like a rock you're pushing up a hill; pretty soon, you're building momentum, you're at the top and you want to make sure everything is in place for take off."

The Wallace "solution" is in use by dozens of U.S. government agencies, ranging from the Department of Transport to the U.S. Geological Survey, which manages earthquakes. More than 6,500 U.S. government buildings are linked on the system. Canadian clients include major banks, senior government ministries, Sun Life Financial Inc. and Rogers Communications Inc.

Toronto, Moffat notes, is the wireless capital of the world. "T.O. has more wireless development people and more RIM partners than anyplace, anywhere."

"We don't need to take a back seat to Silicon Valley," Nardi says. "MaRS is a great rallying point. There's great dynamism here. You walk in the building, you feel it."

"Yeah," says Moffat, "like `the power of pictonics.'" As a MaRS tenant, he attended Dave Gray's workshop on graphic maps that illustrate business processes and products. Gray, founder of flight simulator Xplane.com, had been brought up from St. Louis by Peter Evans, an adviser to the MaRS Venture Group, a not-for-profit venture capital networking organization.

Gray showed 1,000 slides, hip-hop style, in a three-hour session that "blew me away," Moffat says. He spent the weekend "doing his homework," and dumped the data in Gray's lap. In an hour, they mapped out an "Xplanation" graphic to tell the Wallace story. "Dave drew the storyboard based on `What if?' What if the lights go out? Flip it over, and everyone's running around doing what they need to do, guided by Wallace Wireless on their BlackBerry."

Another new Xplane client, and MaRS tenant, is Digniche and its software product, Octopz, which is loaded with visual opportunities — not surprisingly, since Digniche co-founder Barry Fogarty was a professional photographer. With partner Paul Nykamp, he provided 3D images for online product demonstrations for clients such as Ford, Honda and Hewlett-Packard.

"One day, we had an epiphany about how it could be helpful for people, no matter where in the world they're based, to collaborate on designs and 3D images to improve products," Fogarty says.

Nykamp's team created code — two applications are pending at the U.S. Patent and Trademark Office — allowing people to view and mark up digital files together, in real time, linked to webcams, VoIP and text messaging. Five people can be visible on screen, with high security and full encryption, enabling global collaborators to work together on secret research.

Clients report improved productivity with fewer mistakes using Octopz.

It has been two years since the epiphany, from "garage project" to launching Octopz into the global market — a process that will be enhanced by an Xplane graphic map.

"Its visualizations help us explain how our technology fits into prospective clients' global operations," Fogarty says.

Dr. Peter Singer sees the global market through a different lens.

"Life expectancy is 80 years and rising in the developed world, and 40 years and dropping in developing nations," says the former director of U of T's Joint Centre for Bioethics, seated in his MaRS office.

Health care and advances in the life sciences are disproportionately distributed, he says — not where the need is greatest. Hence Singer's latest project: he's co-director, with Dr. Abdallah Daar, of the Canadian Program on Genomics and Global Health, which received a major grant from the Bill and Melinda Gates Foundation and the Canadian Institutes of Health Research.

(Genomics is the study of genes and their functions, including the sequencing of DNA; and of molecular mechanisms and the interplay of genetic and environmental factors in disease.)

Singer and Daar's focus is on helping scientists deal with the ethical issues involved in 14 grand challenges in global health identified by the Gates Foundation in collaboration with a team of international scientists. The challenges include efforts to improve childhood vaccines for use in developing countries, to create new vaccines and control insects that transmit disease.

They call themselves "the foreign policy office of MaRS," and see their role as harnessing fundamental research — on genetics and stem cells, for instance — and figuring out how it can be used to improve life in the developing world. They define best practices to help scientists identify sites for research, approach communities and communicate their purpose. They figure out how to get medicine to where it's most needed.

Plugged into a global network, Singer and Daar haven't forgotten their home base. They developed curriculum material on stem-cell research that's studied by 4,000 Canadian high school students. They encourage students to connect with peers in Bangladesh, where 50 million people have been poisoned by arsenic in wells. From classrooms in Canada, students "fly" — on the Internet — into Bangladesh, brainstorm "healthy water projects," and compete for awards.

Singer and Daar also get students thinking about mosquitoes. There are more than 400 million cases of malaria in the world, caused by infected mosquitoes biting people. In Africa, malaria kills 2,000 children a day.

"Bed nets are not enough," says their colleague Jim Lavery, who has a PhD in bioethics and is participating in trials to genetically modify mosquitoes. He cites cases of insects being manipulated to reduce public health hazards. The Mediterranean fruit fly has been radiated into sterility for decades, with billions of sterile fruit flies released every year, undermining the general population, with no adverse impact identified on birds, reptiles or other creatures.

But bioethics is crucial — to ensure that existing populations aren't harmed by so-called advances. DDT and PCBs proved toxic to humans, animals and the environment. In the Tuskegee syphilis trials, conducted by the U.S. Public Health Service over 40 years, 399 poor black sharecroppers in Alabama were lied to by doctors intent on collecting data from men who died of syphilis.

When genetically modified mosquito trials, carried out in caged field trials, go ahead in southern Mexico, Lavery says "it's conceivable that we could put a huge dent in the mosquito population and in mosquito-borne diseases." It's also conceivable that GM mosquitoes won't work.

Hence the need for risk assessment. And for guidelines to protect poor people in developing nations, who are often the subjects of research trials.

For Singer and Daar, it's about the democratization of science and technology and encouraging Canadians whose ancestors came from Africa, Asia or other parts of the developing world to find a way to contribute "in the old country."

"The world is a very divided place," Singer says. Inequities in knowledge are compounded as research is targeted at the diseases of the West, ignoring the rest of the world.

But when connections are made, breakthroughs are achieved.

The vaccine for hepatitis B, a serious illness that can cause liver cancer and death, wasn't widely available in the developing world because it was too expensive — until vaccine maker Shantha Biotechnics Ltd. in Hyderabad, India, was encouraged to focus on producing an indigenous vaccine. With investment support from Oman and a partnership forged at a World Health Organization office, the Shantha vaccine is sold for 50 cents a dose, compared to more than \$2 for a vaccine produced by a major western pharmaceutical company.

Then, with assistance from Singer and Daar, who organized a series of executive courses in the developing world on genomics, Pakistani officials connected with Shantha, to get the cheaper hepatitis B vaccine into Pakistan.

This is the model of technology transfer that MaRS is promoting: homegrown solutions that result in economic development and better health care.

(MaRS is a not-for-profit research and commercialization organization. Its incubator unit is home to start-ups in areas including IT, life sciences, biotechnology and medical devices.)

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