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Now's the time to take science seriously

By David Suzuki with Faisal Moola

Looking at the enormous changes the world has experienced over the past century, it's clear that the most powerful force shaping our lives and society was not politics or economics but science when applied by business, the pharmaceutical and medical industries, and the military. Think of the impact of antibiotics, chainsaws, nuclear weapons, computers, oral contraceptives, cars, television — the list is long.

And what lies ahead? Human cloning, genetic engineering, artificial intelligence, nanotechnology, and space weapons — to say nothing of environmental issues such as climate change, deforestation, and toxic pollution. How can any society make important decisions about these issues without being scientifically literate and informed?

Too often, the role of science in solving our social, medical, and economic problems is poorly understood because the nature of scientific research, discovery, and application is not understood.

The *Globe & Mail* recently reported that the federal government has radically reduced its support for science. Well, why should Canadians support scientific research?

First, good scientists make important discoveries, and to maintain a top group of scientists, we need a culture that supports and honours its researchers. That can't happen when science funding becomes a political hockey puck slapped around by whichever party comes into power. We need generous long-term support for our top scientists so that they can create clusters of enthusiastic, inspired researchers.

Canadian scientists are a small fraction of all scientists, but they occupy front-row seats to the world's best research because, if they're good, they get invited to small meetings of experts, they are consulted about new insights, and they receive scientific papers before they are published. They become our eyes and ears to the discoveries being made worldwide.

Many people believe that we must identify important areas like cancer, energy, or pollution and then direct the money to those areas so that we can look for solutions or new technologies. That is not how science works. Scientists need money to do their work, and when funding is directed at specific areas, scientists will find ways to make their work relevant to those areas. It's a game that's played to get grant money. I did it when I was an active researcher. I was interested in genetic control of cell division. When cancer-research money became available, I used the rationale that understanding the process of cell division would give us insights into the process by which cells begin to divide out of control as they become cancerous.

Scientists don't go from experiment A to B to C to D to find a cure for cancer. That's just how we write up our results or our grant proposals. Many scientists who have made important discoveries would have never qualified for research grants if the grants were specifically targeted. Let me give you two examples from my area of training, genetics.

In the 1960s, microbial scientists puzzled over an arcane area to do with bacteria and viral infection. They found that certain viruses could infect and kill bacterial hosts while other bacteria seemed immune. How could the bacteria fend off viral infection? You might wonder who cares whether bacteria get sick. But out of this very esoteric work came the answer: Bacteria had enzymes that recognized specific stretches of viral DNA and cut them up. These "restriction enzymes" turned out to be vital tools for genetic engineering, something that could not have been predicted when this Nobel Prize-winning work was started.

I remember as a student in the 1950s slaving over research papers by a woman studying corn. Barbara McClintock was a meticulous scientist and we agonized over her experiments because they were so complex and elegant. She was studying genes in corn that had a peculiar property of changing locations on chromosomes. We never imagined that her work would lead to the discovery of "jumping genes" that are now a vital part of the toolbox geneticists use to modify gene behaviour. Dr. McClintock won a Nobel Prize for work that would never have qualified for grants had there been restrictions for applications.

I would urge politicians and scientists to resist rigidly restricting funding to specific research areas. Instead, they should support scientists who can be judged by their track records, by their papers and talks, in the knowledge that those scientists will have ideas, make observations, and hear about work that will be useful in some area that can't be predicted. And we must have a culture in which science is as important a part of our education as reading, writing, math, and music.

March 27, 2009

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