Government should care about research

By **JOHN M. ARCHIBALD**

"We have all been taught that the shortest distance between two points is a straight line. But the same idea has repeatedly proven not to be true for progress in medical research."

Bruce Alberts,
Editor-in-Chief,
Science Magazine

Like many Canadians, I have a beef about the federal budget announced on Jan. 27. My beef is the lack of commitment Stephen Harper's government has shown to basic scientific research.

In tough economic times, why should we make it a priority to invest in basic research?

History has shown that we simply can't afford not to, that's why.

To be fair, the government's most recent budget does offer investments in science and technology. There is, for example, a significant commitment to establish new "leading edge" research infrastructure and to repair and expand existing facilities. More money for students, in the form of graduate scholarships, will also be available.

Overall, however, the picture is bleak. The major granting councils in this country (i.e., the Natural Sciences and Engineering Research Council of Canada, the Social Sciences and Humanities Research Council of Canada, and the Canadian Institutes for Health Research) have been asked to "streamline" operations and "align" their programs with the science and technology objectives of the government. Translation: budget cuts to basic research.

Why is basic research important? If you or someone you know has recently undergone a medical procedure or diagnostic test, chances are the science underlying that test wasn't laid down five months or even five years ago. More likely, it was based on knowledge generated 25 years ago, made possible by basic research: curiosity-driven science performed with the goal of generating new knowledge and without a direct benefit or application in mind. It is simply impossible to predict the eventual benefit(s) of most scientific discoveries.

Don't believe me? Alexander Fleming discovered antibiotics completely by accident in 1928, having returned from holiday to discover his beloved staphylococcus bacteria had become contaminated – and could be rendered sterile – by a fungus (Penicillium). The field of modern biotechnology, which produces our antibiotics, insulin and growth hormones, would not exist if it weren't for the efforts of basic scientists trying to understand living cells and the molecules comprising them.

A widely used modern laboratory technique for "amplifying" DNA is the "polymerase chain reaction" (PCR), which relies on a heat-stable protein molecule called "Taq polymerase." This molecule was isolated in 1976 by scientists studying how on earth a bacterium could survive in the hot springs of Yellowstone National Park. Today, PCR is used for everything from paternity testing to the screening of newborns for congenital disorders, from archeology to crime scene investigations.

The impact of basic research on socioeconomic health is complex, multifaceted, difficult to quantify, and often imperceptible in the short term. Yet, increasingly, basic research is viewed in terms of its potential for short-term gain – technological development, application and commercial benefit. While capitalizing on scientific discovery in the name of technology or convenience makes obvious sense, the ultimate power of basic research lies not in its short-term application, but in the long-term generation of knowledge.

Making new buildings, sprucing up old ones, providing funds for scientists to purchase new equipment – all these are worthy investments. Unfortunately, such investments will be wasted if they are not matched by a steady infusion of funds with which to fill the buildings, run the equipment, and analyze the data that history tells us will serve as the foundation for future advances in science, medicine and technology. A large fraction of the money spent on research is used to pay the salaries of highly trained individuals and in the context of a "stimulus" budget emphasizing job creation, eliminating jobs in a sector on which future growth will depend makes no sense.

Personally, I am convinced that if basic, curiosity-driven, research is gradually de-emphasized in our society (in Canada and around the world), progress in the medical sciences will grind to a halt. I am sure that Mr. Harper will agree it is imperative that this not happen.

I urge the prime minister to seriously consider the long-term benefits of basic research to Canada. If history is any indication, the citizens of this country 25 years from now will thank him.

John M. Archibald is associate professor, department of biochemistry & molecular biology, Dalhousie University.

The Chronicle Herald, Wednesday, Feb. 18, 2009