

“We will continue to work with leading individuals and institutions in India”

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University of Alberta, Canada

The University of Alberta gives a national and international voice to innovation in the Canadian province and takes a lead role in placing Canada at the global forefront. In an exclusive interview Indira Samarasekera, president, University of Alberta, informs BioSpectrum Chief Editor E Abraham Mathew about the research and partnership plans of the university with India.

What have been the key achievements of the University of Alberta in the life sciences and health sectors?

The University of Alberta (UA) has a long track record of significant advancements in the health sciences dating back to 1921 when chemistry professor and alumnus James Collip played a key role in the development of insulin to treat diabetes. While on a research sabbatical, he refined the pancreatic extract obtained by Frederick Banting and Charles Best so that it could be used in humans. Banting and Best were awarded the Nobel Prize and many feel that Collip should have been included in that award.

The university's world-leading carbohydrate chemistry group has about 50 years of significant breakthroughs to its credit, including Raymon Lemieux's discovery of how India-International.gif to make synthetic sugar (synthesizing sucrose) and how carbohydrates bind to proteins—crucial to everything from immunology to cancer. The work of Lemieux and his colleagues led to new antibiotics and blood reagents, drugs to prevent organ transplant rejection, and improved treatments for leukemia and hemophilia.

More recent examples include:

- The development of the breakthrough Edmonton Protocol method of extracting and transplanting islet cells to treat Type 1 diabetes, freeing patients from the need for supplemental insulin for years at a time
- The first commercial drug treatment for hepatitis B by professor and alumnus Lorne Tyrrell, MD
- Molecular biologist Chris Bleakley discovered the way in which T-cells cause cell death.

The University of Alberta is among the best in the world at diabetes research and is home to the Alberta Diabetes Institute, and is a leader in neonatal and transplantation medicine research working in close partnership with the local health authority to speed research from bench to bedside.

Ranking of universities is common. Where does the UA figure in such rankings in the life sciences and health related sectors?

The Times Higher Education-QS World University Rankings of the year 2008 listed the UA 74 overall, 50 in academic survey rank, 88 in arts and humanities rank, 46 in engineering and IT rank, 45 in life sciences and biomedicine rank, 51 in natural sciences rank and 113 in social sciences rank. UA ranked 106 overall in the 2008 Shanghai Jiao Tong University Academic Ranking of World Universities and 62 in North America.

Briefly describe the biotech work being done at the university in the field of diabetes, agriculture and fuels?

There is extensive biotechnology work happening at the university. Researchers who make discoveries with commercial potential can draw on the resources and expertise of TEC Edmonton, a joint venture between the university and the city of Edmonton to commercialize research.

A significant amount of biotech work is done in the university's NanoFab (micro- and nanofabrication facility) and the National Institute for Nanotechnology (NINT), a joint partnership with the National Research Council, the university and the province. In the words of Jillian Buriak, chemist and Canada Research Chair in Inorganic and Nanoscale Materials, "This place is a jewel in many ways. It has everything you need. The NanoFab (nanofabrication facility) is fantastic with its micro and nano fabrication equipment that is virtually unequaled in Canada — that's the reason NINT came here instead of Montreal, Vancouver or Toronto. There's also the Alberta Center for Surface Engineering and Science that has equipment you won't find anywhere else in North America."

Agriculture research at UA is instrumental in supporting a diverse and economically critical agricultural sector. Food safety is one example of this sort of work. That research is centered at the Rs 124 crore Agri-Food Discovery Place, which supports research in meat safety, crop use for food (including nutritionally enhanced food) and crop use for non-food products such as biodiesel and bioplastics. In addition, there is extensive research and development of crop variations for disease resistance or enhanced nutrition.

The researchers at the Faculty of Engineering are working on advancements in energy research, particularly in terms of energy and environment. In many cases, researchers are working closely with industry to find solutions to business needs such as clean coal technology, oil sands bitumen extraction that uses less water and produces less toxic waste, remediation of land and water used in resources extraction (e.g. coal, oil, gas). The university is home to the Imperial Oil-Alberta Ingenuity Center for Oil Sands Innovation and the multidisciplinary School of Energy and the Environment (part of the Canada School for Energy and Environment).

Some specific examples include:

- David Wishart and his team completed the first draft of the human metabolome, the chemical equivalent of the human genome, opening the door to more targeted drug therapy.
- An interdisciplinary team creating a technology to stimulate the regrowth of tooth root tissue.
- Engineering professors developing a new type of "puffer" or inhaler that allows patients to inhale antibiotics.
- Robert Burrell's development of medical uses for nanocrystalline silver (while working in the private sector, he developed the Acticoat burn dressing, considered the first commercial therapeutic application of nanotechnology in the world).
- Interdisciplinary teams studying prion diseases and ways to develop cost-efficient test for bovine spongiform encephalopathy (mad cow disease) and chronic wasting disease.
- An interdisciplinary team that developed a "lab on a chip" device that allows inexpensive and quick cellular analysis with potential applications in disease diagnosis, remote water testing and more.
- Chemist Jillian Buriak's research team's development of a silicon-based drug delivery system that has been licensed to a pharmaceutical company.

Does the university have associations with Indian institutions? If yes, what is the scope?

The University of Alberta has been actively developing linkages with top Indian institutions such as Indian Institute of Technology (IIT), Mumbai; the Indian Institute of Science (IISc), Bangalore; Petrotech Society, New Delhi; and Tata Consultancy Services.

In March 2009, the University of Alberta and IIT (Mumbai) signed an agreement for international research on energy and nanotechnology. We are looking forward to strengthen our research ties with the leading institutions in India. We have also been developing our linkages in the area of executive education. In 2008, the Petrotech Society sent 24 executives from leading Indian energy companies to UA for a customized one-week training program through our School of Business. Another group is expected to come in 2009. Finally, through partner schools or companies such as Tata, the University of Alberta is actively exploring study, work, and research placement opportunities for outgoing as well as incoming students.

Describe your India agenda if there is one?

The University of Alberta is committed to develop a broad range of activities with India. Not only are we developing strong science and technology linkages with institutions like IIT-Mumbai, we are interested in the study of India. Through a generous donation by a local Indian couple in Edmonton, Prem and Saroj Singhmar, a Chair in Classical Indian Polity and Society was established in our Faculty of Arts several years ago. The Faculty has also recently hired a professor of Indian religions. At the same time, we are expanding the scholarship funds offered for undergraduate students from India. The University of Alberta has excellent professors and facilities which help create an outstanding learning environment for students at all levels. By providing more scholarships, we hope to show Indian students what we have to offer. India is the only location outside of Alberta where our international office has a staff member. I take a very personal interest in our activities with India. I have been there twice in the past year and a half and am chairing an India Regional Council that we recently developed at the University of Alberta. During my trip in December 2007, I was fortunate to have an opportunity to meet with the Prime Minister Manmohan Singh who has an honorary doctorate from the University of Alberta. We will continue to work with leading individuals and institutions in India to create mutually beneficial relationships. Your roots are from South Asia.

What would be your message to South Asian companies and students?

South Asia is a region of growing importance in the world and is gifted with many talented people. I myself came from Sri Lanka to North America as a student many years ago and am fortunate to have become the president of one of Canada's top research universities. I have pursued my personal goals, and I have also laid out a vision for the University of Alberta, to become one of the top 20 public universities in the world by 2020. I am very pleased to be engaging with South Asia, in particular India, in my role as president of the University of Alberta. I believe there are many synergies that can develop by working together, for example through research collaboration and training. I would encourage South Asian students and institutions to explore the many excellent opportunities that the University of Alberta has to offer.

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E Abraham Mathew in Edmonton, Canada