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"India should take inspiration from Australian models"

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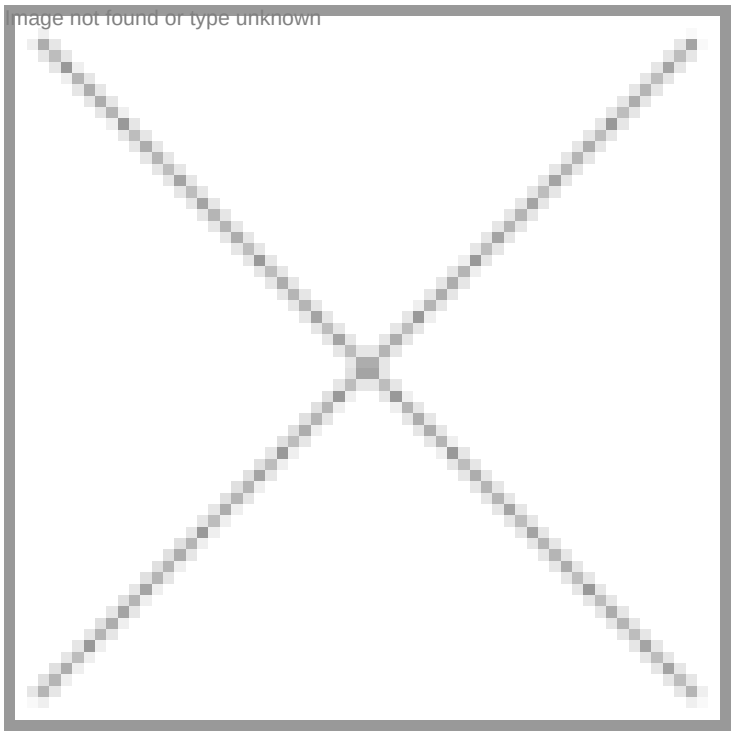
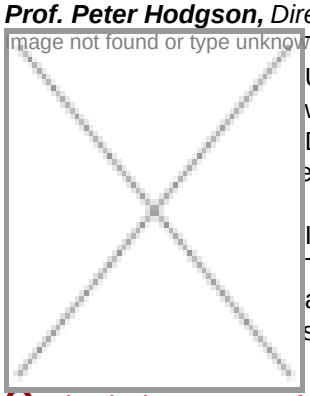


Prof. Peter Hodgson, *Director, Institute for Technology Research and Innovation, Deakin University, Australia*



The Energy and Resources Institute of India (TERI) recently inked an MoU with Australia's Deakin University to establish TERI-Deakin Bionanotechnology Research Center in New Delhi. The center will have 70 researchers, including 50 PhD students enrolled at Deakin and co-supervised by Deakin and TERI staff. The center will also function as a hub for the Deakin India Research earlier this year.

In an interview with BioSpectrum, Prof. Peter Hodgson, Director of Deakin's Institute for Technology Research and Innovation (ITRI) and Australian Laureate Fellow shares information about the purpose of establishing the center, nature of partnership with India, latest trends in so about Indian biotech sector.

Q What is the purpose of establishing the TERI-Deakin Bionanotechnology Research Center?

The objective of establishing a world-class center of excellence between TERI and Deakin University is to address theissues involved in the application of bionanotech concepts. The new center will complement the research activities of both TERI and Deakin. Initially, the focus will be on bionanotech application in the agricultural sector to improve crop yields, reduce the amount of fertilizers and other applications where targeted delivery of molecules will bring the benefits. In the future, this will extend to health and other related areas.

Q What is the nature of your partnership with TERI? What kind of support will be provided by ITRI to TERI?

At this stage, the partnership is built around research topics of mutual interest. We currently have some joint PhD programs involving supervisors from Australia and India. The new bionanotech center will take the collaboration to the next level. TERI

will provide laboratories and staff facilities, while Deakin will supply staff, equipment and also sponsor some of the students to travel to Australia.

Q Can you tell us about the research activities going on at ITRI?

ITRI is a cross-disciplinary research center. It has many of Deakin's leading researchers and state-of-the-art laboratories for materials science, nanotechnology, chemical sciences and intelligent systems. We are interested in the research for the future where all of these technologies intersect.

Q How can bionanotechnology provide solutions to the issues concerning healthcare, water and food security?

Bionanotechnology is a segment of nanotechnology space where we attempt to either replicate biological systems or we depend on biotechnology and chemistry to create functional materials for the future. A major international focus is on targeted drug delivery. Many of our current healthcare solutions target the 'average' population and have a safety margin. Personalized healthcare is the next big thing. In targeted drug delivery, we are designing complex molecules that can target certain site (say a cancer cell) and then release the agent with focus on that specific cell. The cell can then be knocked out by radiation without damaging the healthy cells. In agriculture, if we can deliver the fertilizer or growth factors to the most appropriate parts of the plant then we can potentially reduce the use of pesticides and fertilizers, as it is a major issue that affects the health of human being.

Q To what extent will the bionanotechnology transform materials science?

In the materials science space, DNA is considered as a polymer (plastic). We can create complex molecules that have numerous applications. The reality is that we still consider cells and other subcomponents for their chemical attributes rather than as a simple cell. Most of the world is made up of surfaces â€“ if we can change how surfaces interact then we can look at self cleaning buildings and more efficient catalysts. This approach opens up many other connected areas. Medicinal chemistry may help us understand the ayurvedic solutions to certain health issues. It is a major area of focus in China and it really needs to be explored in India and Australia.

Q What are your views on the growth of biotech sector and R&D in India?

The biotech sector has had a remarkable period of growth in India. Some of our partners including TERI; Center for Cellular and Molecular Biology in Hyderabad, India; VIMTA Labs Hyderabad and Bangalore; have facilities that are truly world-class. There is no doubt that like in all value-added sectors (except in IT) the biggest gap is qualified personnel. India is producing many graduates and masters degree holders, but the real need for these types of industries is often at the higher end â€“ PhDs. Some comparative studies between Australia and India suggest a need for over 2,000 PhD holders in biotechnology alone to meet the industry needs within five years. The new bionanotech center will contribute to this growing need.

Joint initiatives between academic institutions and industry are still missing in India. I think we have a number of working models in Australia that I am keen to try and see how they could be Indianised to help grow the required human capital. The demand is not only for PhD holders with research papers, the researchers should also possess an exploratory mind with advanced problem solving skills to contribute to industry, to grow new industries and to emerge as leaders of the future. India has a chance to break the stereotype of PhDs as boffins.

Q What are other research areas where India and Australia can build partnership?

Bionanotechology is India's big chance to do something different to China and other parts of the world. Many countries have invested massively in other forms of nanotechnology. With strong biotech and IT skills, India has enormous potential. By shifting focus on future technologies like bionanotechnology, India can leap frog China in development.

Regarding other areas, there are common issues around climate change, water utilization, alternative energy production and agriculture. An area I am personally keen to see development is public health. Australia has developed one of the best healthcare systems in the world that spread over a large area. Extensive work is happening at Deakin in lifestyle-related diseases such as diabetes and obesity. India has to face the issues related to lifestyle as the young population in the country is more prone to these disease due to their affinity towards western food habits. The growing poverty level will also add to health issues related to food and water supply, and quality issues.

Rahul Koul in New Delhi