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Partnership demonstrates the vital role of molecular imaging in combating disease

A new research and educational partnership between the Australian Nuclear Science and Technology Organisation (ANSTO), the University of Sydney and other leading universities in the Asia-Pacific region demonstrates the important role that molecular imaging will play in unravelling the molecular mechanisms of disease.

Under the partnership, Sydney University's Brain and Mind Research Institute (BMRI) and ANSTO Life Sciences will establish Australia's first fully dedicated medical research cyclotron and radiochemistry facility that will produce radiopharmaceuticals for the Australian imaging research community.

The cyclotron accelerates protons to produce short-lived positron-emitting radioisotopes that radiochemists will use to label chemical probes. Scientists will then use these probes together with very sensitive imaging instruments to observe physiological changes in living animals and to test new treatments for a wide variety of disease conditions. As well as using current state-of-the-art technology, a key focus for the collaboration is to develop new radiopharmaceuticals, instruments and scientific methods that extend the potential applications of molecular imaging in the future.

"The potential of this work is immense as we will be able to follow changes that occur during brain development and the evolution of disease over the whole animal's life," explained Steven Meikle, Professor of Medical Imaging Physics at the University of Sydney.

"In the long term this could help to identify more effective treatments for diseases such as schizophrenia, Alzheimer's and cancer."

This facility will be part of the recently established National Imaging Facility, a network of open access imaging laboratories in eight Australian universities and research institutes supported by the National Collaborative Research Infrastructure Strategy (NCRIS).

Under the NCRIS initiative, the Commonwealth and NSW Governments are providing \$2.6 million towards the \$10 million cost of establishing the cyclotron and radiochemistry facility.

To take advantage of these world-class facilities, a new Master of Molecular Imaging program—the first of its type in the southern hemisphere—will take its first cohort of students in Semester 1, 2011.

Led by Sydney University's Faculty of Health Sciences, the course will be collaboratively taught at the BMRI by leading researchers from the Universities of Sydney and Queensland, the National University of Singapore and ANSTO.

"The course will prepare the next generation of scientists and engineers to develop new radiopharmaceuticals, imaging instrumentation and computational algorithms for imaging gene, protein and cell function in health and disease," Professor Meikle said.

It is designed for students from a wide range of learning backgrounds, including physics, chemistry, medical science, IT and engineering. Students will work together in a multidisciplinary learning environment to develop skills in a range of advanced imaging methodologies and apply them to challenging problems in biomedicine and health.

"These cross-institutional initiatives will give researchers access to the latest imaging technology and allows us to open up new opportunities for talented students to join our efforts to further advance this exciting field."

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