Canadian Isotope Project enters final stretch

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A research project exploring the potential for making medical isotopes with X-rays from a particle accelerator instead of a nuclear reactor is about to move to the large scale. The Canadian Isotope Project, led by the Canadian Light Source (CLS) and partners including the National Research Council of Canada, and medical researchers in Winnipeg, Ottawa and Toronto, is set to scale up their work to production levels with the delivery of a new particle accelerator built by Ontario-based Mevex Corporation.

"We are very excited to be passing this key milestone in the project," says Mark de Jong, CLS Director of Accelerators and project leader. "We have made a lot of progress over the last year in terms of the project's theoretical work, refining different pieces of the process and moving construction and design of our test bed forward. With the delivery of this full-scale accelerator we can now move to demonstrate what we set out to do – produce medical isotopes safely, reliably and affordably."

The Canadian Isotope Project uses a particle accelerator to bombard a target made of molybdenum-100 metal with high-energy X-rays. The X-rays knock a neutron out of the nuclei of some of the molybdenum-100 atoms in the target, converting them to the isotope molybdenum-99. After being chemically separated from the target, the molybdenum-99 will be shipped to hospitals where it decays into technetium-99m and injected into patients for diagnosing heart conditions.

Two or three accelerator systems like the one now being installed at the

CLS could supply all of Canada's needs for technetium-99m.

Researchers at the National Research Council in Ottawa have been performing theoretical modeling of key aspects of the production process and producing small quantities of medical isotope using the same process as will be used at the CLS with a smaller particle accelerator. Isotopes produced by the full-scale facility at the CLS will be chemically separated from the metal target by scientists at the Winnipeg Health Sciences Centre and assessed by doctors at the University of Ottawa Heart Institute and University Health Network in Toronto.

The Canadian Isotope Project was one of four projects funded by the Government of Canada's Non-reactor-based Isotope Supply Contribution Program (NISP). The CLS-led project received $10 million from NISP with an additional $2 million from the Province of Saskatchewan. NISP was established to fund research into ways to produce medical isotopes without using a nuclear reactor in the wake of shortages caused by difficulties with Canada's NRU research reactor.

The NISP projects are all working to produce the most used medical isotope, technetium-99m, which is used in approximately 5500 medical scans daily in Canada.

Installation of the accelerator at the CLS is expected to be completed by the end of February, with the first experiments with the full-size accelerator system taking place in April. The first batch of technetium-99m is anticipated to be ready for shipment for testing at the Winnipeg Health Sciences Centre by the end of April or early May.

More information: www.lightsource.ca/medicalisotopes

Provided by Canadian Light Source