LIFE-SAVING MEDICAL ISOTOPES

CANADIAN ISOTOPE INNOVATIONS CORP (CIIC)

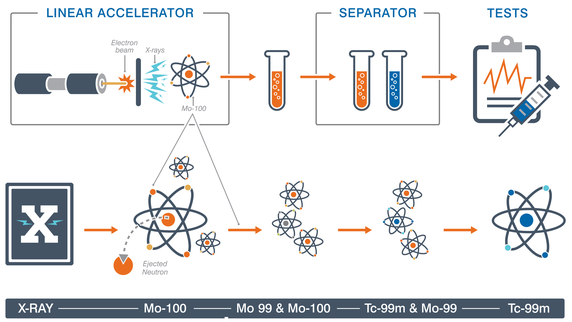
MEDICAL ISOTOPE PRODUCTION FACILITY

The Medical Isotope Production (MIP) facility at the CLS was funded by Natural Resources Canada and the Government of Saskatchewan. In November 2014, the MIP facility proudly made its first shipment of medical isotopes produced using its dedicated accelerator.

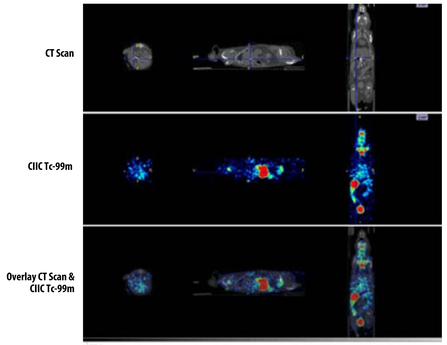
Canadian Isotope Innovations Corporation (CIIC) was established in 2015 to produce and sell medical isotopes to researchers and nuclear pharmacies in Canada and around the world using the MIP facility. Based in Saskatoon, CIIC continues to innovate by improving the production components and supplying other isotopes.

THE TECHNIQUE

CIIC has created an innovative, low-waste method to produce medical radioisotopes, including Mo-99, using an electron accelerator. Over 80% of all medical procedures using radioisotopes require Mo-99. Yet, the reliable supply of Mo-99 has been challenged in past decades by unexpected or extended shutdowns of reactor and processing facilities around the world. CIIC's electron accelerator technology can replace these facilities with lower capital, operating, and waste management costs.



Technetium 99 (Tc-99m) is produced through a series of steps starting with blasting atoms of Mo-100 with high energy X-rays from an electron accelerator. This process removes a neutron from Mo-100 to create the Mo-99 radioisotope. Mo-99 naturally decays into Tc-99m, which radio-pharmacists then use to prepare tracers injected into patients for diagnostic scans.



Courtesy of Dr. Fonge, University of Saskatchewan, 2019.

Pre-clinical studies in mice demonstrating bioequivalence of CIIC produced Tc-99m. The highlighted red areas indicate the concentration of Tc-99m in the salivary glands and thyroid, as well as the excretion pathway of Tc-99m as expected (compared with the approved Canadian reference product for Tc-99m). This form of Tc-99m is used for imaging the thyroid and salivary glands.

THE PRODUCT

Radioisotopes are a key component in medical imaging techniques that provide information about the functioning of specific organs within the human body. Radioisotopes are an unstable form of an element that emit radiation to transform into a more stable form.

In diagnostic applications, the radioisotope is attached to a drug that targets a specific area or organ of the body and a scanner is used to detect the radiation to create an image of the targeted region. This allows physicians to diagnose a variety of ailments, including issues with thyroid, bones, heart and liver. Tc-99m is the most common medical isotope used in 80% of diagnostic SPECT scans (primarily for cancer and cardiovascular disease). Approximately 40 million procedures use Tc-99m each year worldwide.

LEADING INNOVATION

- World's first commercial medical isotope accelerator production platform
- World-class team of experts
- Continued innovation for production of other isotopes
- No long-lasting nuclear waste
- Low cost, environmentally friendly medical isotope production
- CIIC's medical isotopes are pure and effective

Medical isotopes save lives. The industry needs innovation to address a critical shortage.

CLS and CIIC experts have created an innovative medical isotope production platform that produces cleaner, safer, higher-quality medical isotopes.

CANADIAN ISOTOPE INNOVATIONS