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Media Backgrounder – ARTMS™ Products Inc.

The Global Isotope Crisis

In recent years the world has witnessed a global isotope crisis involving major supply shortages of the most commonly used isotope in nuclear medicine, technetium-99m (Tc-99m). This isotope is used in over 80% of all nuclear medicine imaging procedures in areas such as cardiology, oncology, and neurology.

Today, Tc-99m is produced by nuclear reactors, many of which are ageing and increasingly unreliable. Unscheduled shutdowns of two main production reactors in 2007 and 2009 led to prolonged global Tc-99m shortages, the effects of which were directly seen by patients around the world. In addition, these reactors use weapons-grade uranium to produce Tc-99m, the implications of which concern governments and nuclear associations.

The risk of another global Tc-99m shortage is high, especially when Canada's National Research Universal (NRU) reactor halts isotope production in October 2016, and shuts down entirely in the fall of 2018. The NRU currently produces less than 20% of the world's supply of Tc-99m, but it has the capacity to produce nearly 80%. In a recent report, the U.S. National Academies stated the problem: After 2018, if another member of the ageing reactor fleet goes down, the NRU will not be available to make up for the loss.

Realizing an Alternative Approach

In 2009, a Canadian research consortium, led by TRIUMF (Canada's national laboratory for particle and nuclear physics and accelerator-based science) and including experts from the BC Cancer Agency (BCCA), the Centre for Probe Development and Commercialization (CPDC), the Lawson Health Research Institute, and the University of British Columbia (UBC), was formed to investigate alternative methods for isotope production. The team received funding from the Canadian Institute of Health Research (CIHR) and the Natural Sciences and Engineering Research Council of Canada (NSERC) to determine whether cyclotron-based medical isotope production would work. Once feasibility was established, Natural Resources Canada (NRCan) provided substantial funding through successive programs (Non-reactor Isotope Supply Program, NISP, and Isotope Technology Acceleration Program, ITAP) to bring the effort to its current state.

In February 2012, the consortium successfully produced Tc-99m on a GE cyclotron, similar to what is already installed in many Canadian hospitals. In the following years, the research consortium achieved successive milestones, eventually using an ACSI cyclotron to produce 34 curies of Tc-99m over six hours – enough to meet the daily demand for the province of British Columbia.

The consortium was recognized for its groundbreaking research in February 2015, when the team was awarded the NSERC Brockhouse Canadian Prize for Interdisciplinary Research in Science and Engineering.

Transitioning From Concept to Clinic

The interdisciplinary consortium behind this innovation is comprised of a broad spectrum of experts, who moved the technology from concept to clinic. Having established the ability to routinely produce large, clinical quantities of Tc-99m, the team is pursuing a human clinical trial with the goal to establish diagnostic equivalence between cyclotron-produced Tc-99m and traditional reactor-produced Tc-99m. Health Canada is set to analyze data to establish patient dose and pharmaceutical performance equivalence for Tc-99m produced in this way.

The Story of ARTMS™ Products Inc.

The four institutions involved in the consortium have combined all intellectual property and know-how into a single entity called ARTMS™ Products Inc., a company designed to carry the effort forward and into the commercial arena.

ARTMS holds exclusive global rights to this award-winning Canadian technology. The ARTMS technology includes all the required products and procedures for Tc-99m production using cyclotrons. The cyclotron produces isotopes by bombarding a high-energy proton beam against specific chemical 'targets'. ARTMS' targets are coated with non-radioactive molybdenum-100, following a proprietary method for which patents have been filed.

This reliable and safe solution offers the potential to revolutionize medical isotope production: instead of producing Tc-99m in a small number of large, global facilities, it can be produced via local hospitals, clinics, and radiopharmacies that already have medical imaging infrastructure in place.

More information on medical isotopes and cyclotrons can be found in this FAQ.

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About ARTMS Products, Inc.

ARTMS™ Products Inc. is a leader in the development of novel technologies and products which enable the production of the world's most-used diagnostic imaging isotope, technetium-99m (Tc-99m), using local, hospital-based medical cyclotrons. ARTMS holds the exclusive global commercialization rights to award-winning and proprietary Canadian inventions which address these challenges and which offer the prospect of revolutionizing the nuclear medicine industry.

About TRIUMF

TRIUMF is Canada's national laboratory for particle and nuclear physics and accelerator-based science. An international centre for discovery and innovation, TRIUMF advances fundamental, applied, and interdisciplinary research for science, medicine, and business. Owned and operated by a university consortium, TRIUMF trains and inspires future leaders in science and technology. The laboratory is a hub for inquiry and ingenuity, a Canadian centre of excellence deeply integrated into the global scientific community. TRIUMF's multidisciplinary team of over 500 staff and trainees collaborates with Canadian and international users who visit the laboratory to leverage its world-class facilities. Together, they drive compelling research and develop ideas and innovations that benefit humanity. Connect with TRIUMF on Twitter, Facebook, and Instagram: TRIUMFLab. www.triumf.ca