Production of Mo99/Tc99m by the Photo-Neutron Process and Regulatory Pathway to Clinical Use in Canada

K.O. Mang'era
Radiopharmaceuticals Research Group
Winnipeg Health Sciences Centre and University of Manitoba, GC219-820 Sherbrook St., Winnipeg, Manitoba R3A 1R9

ABSTRACT

Linear accelerator Mo100(g,n)Mo99 production of Mo99/Tc99m being developed by the Prairie Isotope Production Enterprise promises to be more environmentally friendly, cheaper, more decentralized and more secure than current reactor supply chain. A commercial scale 35kWx35MeV accelerator should be operational May 2014 at the Canadian Light Source.

We have studied natural molybdenum and/or Mo100-enriched discs (>97%) irradiated at 10MeV×1kW, 25MeV×25kW and 35MeV×2kW. The discs were dissolved in 30% hydrogen peroxide and Tc99m obtained by solvent generator extraction and evaluated for quality by compendial protocols. Tc99m was used to radiolabel MDP, DTPA, sestamibi and macroaggregated albumin radiopharmaceutical kits.

Presentation will provide the production and evaluation of Mo99/Tc99m isotopes from linear accelerators, and the yields and purities of Mo99, Tc99m and the Tc99m-radiopharmaceuticals. A regulatory pathway developed after Health Canada consultation to lead to the authorization of the product for Canadian patients will be outlined.

Funding in part by the Isotope Technology Acceleration Program, Canada