(GENERAL PROGRAM)

(Proposed to be presented as Oral Communication)

Abstracts List of Topics:

Radiopharmaceuticals & Radiochemistry & Dosimetry

308. New & Innovative

Abstract Title:

CYCLOTECH – Contribution to Solve the Technetium Shortage by Using Low Energy Medical Cyclotrons

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Abstract Text:

This paper presents work in progress, to develop an efficient and economic way to directly produce Technetium 99metastable (^{99m}Tc) using low-energy cyclotrons. Its importance is well established and relates with the increased global trouble in delivering ^{99m}Tc to Nuclear Medicine Departments relying on this radioisotope. Since the present delivery strategy has clearly demonstrated its intrinsic limits, our group decided to follow a distinct approach that uses the broad distribution of the low energy cyclotrons and the accessibility of Molybdenum 100 (^{100}Mo) as the Target material. This is indeed an important issue to consider, since the system here presented, named CYCLOTECH, it is not based on the use of Highly Enriched (or even Low Enriched) Uranium 235 (^{235}U), so entirely complying with the actual international trends and directives concerning the use of this potential highly critical material. The production technique is based on the nuclear reaction ^{100}Mo (p,2n) ^{99m}Tc whose production yields have already been documented.

Until this moment two Patent requests have already been submitted (the first at the INPI, in Portugal, and the second at the USPTO, in the USA); others are being prepared for submission on a near future.

The object of the CYCLOTECH system is to present ^{99m}Tc to Nuclear Medicine radiopharmacists in a routine, reliable and efficient manner that, remaining always flexible, entirely blends with established protocols.

To facilitate workflow and Radiation Protection measures, it has been developed a Target Station that can be installed on most of the existing PET cyclotrons and that will tolerate up to 400 μA of beam by allowing the beam to strike the Target material at an adequately oblique angle. The Target Station permits the remote and automatic loading and discharge of the Targets from a carriage of 10 Target bodies.

On other hand, several methods of Target material deposition and Target substrates are presented. The object was to create a cost effective means of depositing and intermediate the target material thickness (25 - 100μm) with a minimum of loss on a substrate that is able to easily transport the heat associated with high beam currents.

Finally, the separation techniques presented are a combination of both physical and column chemistry. The object was to extract and deliver ^{99m}Tc in the identical form now in use in radiopharmacies worldwide. In addition, the Target material is recovered and can be recycled.

Foi decidido que não será apresentada a versão integral deste documento.

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It has been decided that it would not be shown the entire version of this document.

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