

# TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Homi Bhabha Road, Mumbai-400 005

April 26, 2018

## ASET Colloquium

- Speaker** : **Dr. Sharmila Banerjee** (*Head, Radiation Medicine Centre, BARC & Senior General Manager, Medical Cyclotron Facility & Regional Centres, BRIT*)
- Title** : **Lutetium-177 the new prodigy in therapeutic nuclear medicine**
- Date & Time** : **Friday 04 May 2018 at 16:00 hrs.**
- Venue** : **Lecture Theater (AG-66.)**

### Abstract :

Lutetium-177, has emerged as a promising radionuclide for targeted radiotherapy. The clinical efficacy of several  $^{177}\text{Lu}$ -labeled agents has been demonstrated in the treatment of malignant disorders. The favourable nuclear characteristics and the feasible production route of high specific activity  $^{177}\text{Lu}$  in substantial amounts with adequate radionuclidic purity are the prime factors for the widespread interest in its clinical use. The long half-life of this radionuclide offers distinct logistical advantages, particularly in countries with limited reactor facilities. The chemistry of the radiolanthanide  $\text{Lu}^{3+}$  allows facile radiolabeling of different molecules either directly or through bifunctional chelating agents.

The production of  $^{177}\text{Lu}$  from enriched  $^{176}\text{Lu}$  targets via the direct ( $n, \square$ ) route in the medium-flux Dhruva reactor has been standardised in BARC. A host of molecular vectors have been labeled, towards development of a variety of agents for use in targeted radiotherapy, the noteworthy ones being  $^{177}\text{Lu}$ -DOTA-TATE and  $^{177}\text{Lu}$ -PSMA, for treatment of neuroendocrine and prostate malignancies, respectively.  $^{177}\text{Lu}$  satisfies the essential requirement of, 'theranostics', a property which enables nuclear medicine to determine the initial localization of the radiopharmaceutical by imaging and subsequently towards deciding the treatment regime. The individualized therapeutic dose of the radiopharmaceutical thus derived, is administered to a patient, demonstrating the concept utilized in 'personalized medicine'.

The talk will present an overview of the evolution of  $^{177}\text{Lu}$  for therapy and the wide spectrum of applications that are being pursued in the development of  $^{177}\text{Lu}$ -based radiopharmaceuticals.

### About the Speaker:

Dr. Sharmila Banerjee heads the Radiation Medicine Centre, BARC. She is also the head of the Medical Cyclotron Facility and the 4 regional centres of Board of Radiation and Isotope Technology. She is a senior Professor of HBNI. She obtained her M.Sc. from the University of Calcutta and Ph.D from IIT, Mumbai. Her research focuses on development of diagnostic and therapeutic radiopharmaceuticals and their clinical translation. The group led by her achieved the indigenous production of Lutetium-177, in India and demonstration of its use in the preparation of radiopharmaceuticals for targeted radiotherapy in cancer patients. She has acted as the International Atomic Energy Agency expert on radiopharmaceuticals in several countries and has been the India-representative in several IAEA sponsored multi-country coordinated research projects. She has been awarded the DAE Homi Bhabha Science & Technology Excellence Award in 2010, and the Homi Bhabha Memorial Oration Award in 2017. She has more than 200 publications in international journals. She is a Fellow of the Indian College of Nuclear Medicine.



Dr. Satyanarayana Bheesette  
(Coordinator, ASET Forum)