CME 14 (Dosimetry/Radiation Protection/Translational Molecular Imaging & Therapy)
Wednesday, October 25, 10:00-11:30

Session Title
Alpha Particle Dosimetry, Does High LET Lead to High RBE?

Chairs
Marion Hendriks-de Jong (Rotterdam)
Uta Eberlein (Wurzburg)

Programme

10:00 - 10:25	Stig Palm (Gothenburg): Preclinical Experience in Alpha Particle Dosimetry
10:25 - 10:45	George Sgouros (Baltimore): Small Scale Dosimetry and RBE of Alpha-Particles
10:45 - 11:05	Cecilia Hindorf (Skane): Ra-223: Imaging, Dosimetry and Radiation Protection
11:05 - 11:30	Clemens Kratochwil (Heidelberg): Clinical Experience with ^{225}Ac-PSMA-617 for PSMA-Targeted α-Radiation Therapy of Metastatic Prostate Cancer

Educational Objectives
1. Prerequisites for and experience in the use of alpha particles in translational research
2 Dosimetry requirements and dose-response relationship for alpha-particles
4. Imaging, dosimetry and radiation protection in a clinical routine alpha-emitter application
5. Novel applications for alpha therapies

Summary
Alpha emitters are becoming of increasing importance for the application in therapeutic nuclear medicine. For this, translational research which involves in-vitro and animal experiments with the correspondingly labelled compound is the first step. The respective results of this research need to be then translated into an estimate of the efficacy and safety of the compound for potential human use.
Dosimetry for alpha particles has to be performed on a small scale due to the short range of the alpha particles and a high local absorbed dose for determining the relative biological

effectiveness (RBE) of a treatment. For obtaining this quantity the differences in efficacy and toxicity to the conventional treatment using beta particles need to be assessed.
The use of alpha emitters in a clinic environment requires extra measures with respect to imaging, dosimetry and radiation protection. This will be shown for the example of Ra-223 therapy; a radiopharmaceutical that has been licensed for treating bone metastases of prostate cancer.
Other radiopharmaceuticals and isotopes such as Ac-225-labelled PSMA have also been applied in patients for treating prostate cancer; results of and experience with this novel treatment modality will be reported.

Key Words
Alpha Particles, translational research with alpha emitters, dosimetry, relative biological effectiveness, clinical applications