Contribution ID: **171** Type: **Invited Lecture**

INVITED LECTURE - On the road from Radiopharmacy to Molecular Imaging: the fundamental role of Technetium and Rhenium Chemistry

Monday 17 September 2012 11:00 (20 minutes)

Imaging and visualization of molecular events on the cellular and subcellular level requires the design and the syntheses of highly specific compounds which have to to accumulate at desired target sites but should be rapidly cleared from non-targeted organs. Visualization must take place at the living intact subject and the patient.[1] This makes radiolabeled compounds a priority modality for imaging. The design of highly specific compounds does not only concern the biological carrier of the imaging agent as often believed, but the label in particular. Consequently, the label cannot be considered as "just a tag"any longer, but its properties and opportunities have to be integrated in the entire design. Transition metals such as technetium and rhenium (and others) are predestinated to assume roles of structure and function essential molecules due to their inherent diversity of bonds and ligands. Drug finding and development needs, thus, exploration of fundamental chemistry with application in mind. The presentation will outline with examples the importance of fundamental chemistry of technetium and rhenium for applications of concepts and agents. A focus will be put on cyclopentadienyl complexes to emphasize the 3D-space occupation concept. Aspects of the theranostic concept in which technetium complexes are used for imaging and rhenium homologous for therapy will be presented[2] as well as the integration of Tc and Re in very small biological molecules.

[1] S. Achilefu, Chem. Rev. 2010, 110, 2575-2578.
[2] D. Can, B. Spingler, P. Schmutz, F. Mendes, F. Raposinho, F. Carta, A. Innocenti, I. Santos, C. T. Supuran, R. Alberto, Angew. Chem. Int. Ed. 2012, 51, 3354-3357.

Author: Prof. ALBERTO, Roger (University of Zurich, Switzerland)

Presenter: Prof. ALBERTO, Roger (University of Zurich, Switzerland)

Session Classification: Session 1 - Radiopharmaceutical Chemistry (radiodiagnostics, radiotherapy, theragnostics)

Track Classification: Radiopharmaceutical chemistry, radiodiagnostics, radiotherapy, theragnostics