

Title	Towards the development of new radiopharmaceuticals based on thermodynamically strong and kinetically inert metal-ligand complexes.
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Project description:

The present research program aims to develop new radiopharmaceuticals for cancer therapy. Radiopharmaceuticals are constituted by a molecule bearing a targeting agent and a complexing moiety, and by a suitable radionuclide metal ion which represents the active (toxic) part of the drug. Complex stability and kinetic properties of the complex should guarantee that the radionuclide is firmly bound to the molecule, thus avoiding radionuclide releases outside the target site. The present project, named ISOLPHARM, involves the INFN of Legnaro (PD) (Istituto Nazionale di Fisica Nucleare), and the departments of Chemical Sciences (DISC) and Pharmaceutical Sciences (DSF) of the University of Padova.

Measurements aim to characterize the metal-ligand interactions from both a thermodynamic and kinetic point of view. Potentiometric, spectrophotometric, NMR and ESI mass measurements will be performed. As molecules are not commercially available, their synthesis will be performed at the department of Pharmaceutical Sciences. Periodic group meetings as well as short working periods will be scheduled also at the INFN.

Publications:

- F. Borgna, M. Ballan, C. Favaretto, M. Verona, M. Tosato, M. Caeran, S. Corradetti, A. Andrighetto, V. Di Marco, G. Marzaro, N. Realdon, Early Evaluation of Copper Radioisotope Production at ISOLPHARM, *Molecules* 2018, 23, 2437.
- V. Di Marco, M. Tosato, et al, complex formation between Ag(I) and a possible radiopharmaceutical, 2019, paper in preparation.

Collaborations/Network:

(other than INFN, DISC and DSF) Dr. Mattia Asti, S.S Radiochimica, Hospital of Reggio Emilia. Trento Institute of Fundamental Physics and Applications (TIFPA). Istituto Oncologico Veneto, Padova. Prof. Roger Schibli, Paul Scherrer Institute (PSI), Switzerland.

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