



FACULTY OF SCIENCE
Charles University

Department of Inorganic Chemistry

Prof. RNDr. Petr Hermann, Dr.

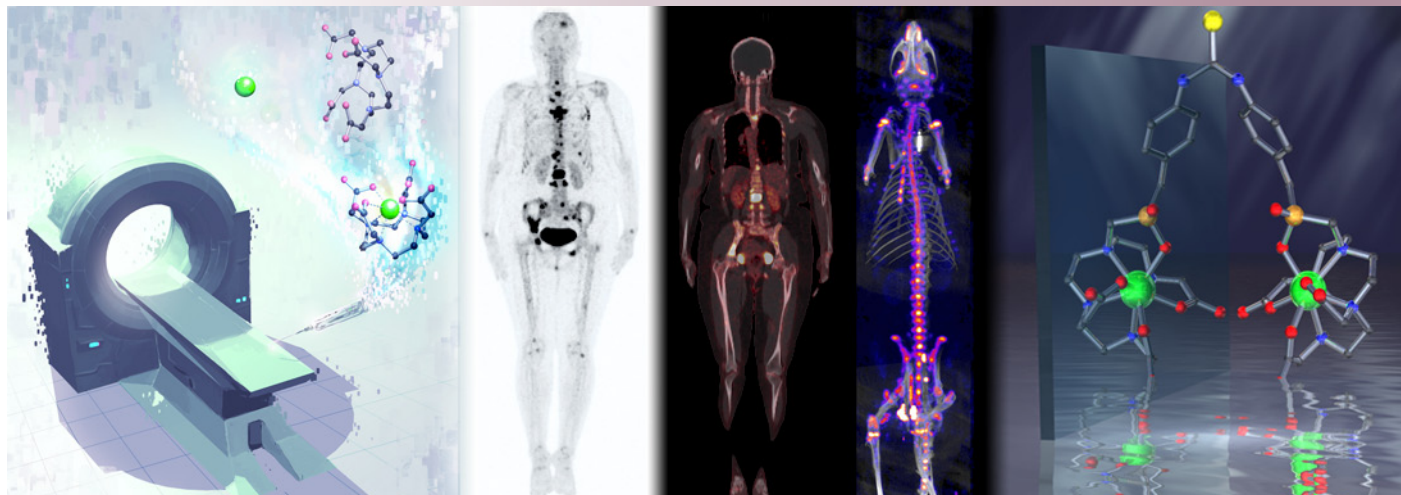
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Hlavova 8, Prague 2, CZ-12840, Czech Republic, EU

Team members: Prof. Ivan Lukeš, Doc. Jan Kotek,

Doc. Vojtěch Kubíček

GROUP OF COORDINATION AND BIOINORGANIC CHEMISTRY



RESEARCH AREA & EXCELLENCE

Coordination chemistry, chemistry of macrocyclic ligands, organophosphorus chemistry, probes for molecular imaging or therapy

- Synthesis and characterization of new macrocyclic ligands and their complexes.
- Contrast agents for Magnetic Resonance Imaging (MRI).
- Carriers of metal radioisotopes for radiodiagnostics (SPECT, PET).
- Radiopharmaceuticals for imaging or therapy of tumors and metastases.

Mission

Development of new medicinal probes for improved medical imaging techniques and new metal radioisotope carriers for imaging or radiotherapy.

KNOW-HOW & TECHNOLOGIES

Content of Research

- Synthesis of macrocyclic ligands
- Synthesis of organophosphorus compounds.
- Synthesis and characterisation of metal complexes in aqueous solutions

Main Capabilities

Synthesis, Potentiometry, NMR, MS, X-ray, optical methods

EXPECTATIONS & OFFERS

Offers

We offer our expertise within a diverse range of issues related to the design, synthesis, characterisation and medicinal application of ligands and metal complexes as well as some of their conjugates (e.g. with bis(phosphonate) group for bone targeting).

Requirements

We are looking for cooperation in the fields of molecular imaging (MRI, PET, SPECT, and optical methods), radiotherapy and other applications of metal complexes in biomedical science.

RESEARCH EQUIPMENT

Standard equipment for synthesis and characterisation of organic compounds and their metal complexes.

PARTNERSHIPS & COLLABORATIONS

Academic partners: Cooperation with many academic research groups in the Czech Republic as well as in Europe through collaborative projects (Munich, Mainz, Dresden, Nantes, Torino). Several complexes have been advanced into clinics as experimental radiopharmaceuticals (tens of successfully treated patients)

– Important cooperation with MRI laboratory of Institute for Clinical and Experimental Medicine (IKEM)

– Participation in the international projects – 6th framework programme, COST projects (frequent participation starting in 1999), bilateral cooperation.

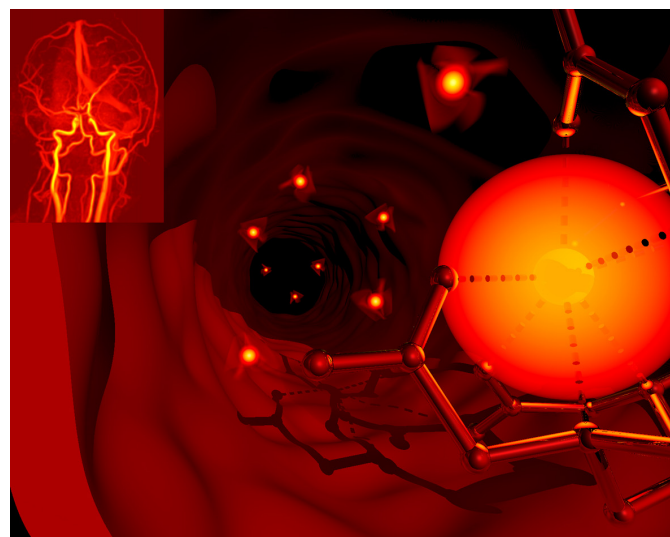
Public and Private sector: RadioMedic, s.r.o. (doc. František Melichar) | Interpharma Praha a.s.

Current Projects

- COST TD1004 – Theragnostics imaging and therapy: an action to develop novel nanosized systems for imaging-guided drug delivery
- COST TD1007 – Bimodal PET-MRI molecular imaging technologies and applications for *in vivo* monitoring of disease and biological processes
- COST CM1006-EUFEN: European F-Element Network
- Czech Science Foundation P207/11/1437 – Novel classes of contrast agents for magnetic resonance imaging
- Czech Science Foundation 13-08336S – Hybrid materials based on macrocyclic ligands for medical applications
- Technology Agency of the Czech Republic TA03010878 – Development of new targeted radio-pharmaceuticals for diagnostic and therapeutic application in nuclear medicine

ACHIEVEMENTS

Book chapter "Synthesis and Characterization of Ligands and their Gadolinium(III) Complexes" in "The Chemistry of Contrast Agents in Medical Magnetic Resonance Imaging" (A. E. Merbach, L. Helm, É. Tóth eds.), John Wiley & Sons 2013 (ISBN978-1-119-99176-2).



In the last 10 years, more than 90 papers in international journals.

Patents

- I. Lukeš, P. Hermann: "Novel Chelating Agents of Tetraazacyclododecanemethyl-phosphonictriacetic Acid Derivatives and Their Conjugates, Their Synthesis and Use as Diagnostic and Therapeutic Agents" PCT Int. Appl. WO03008394 (2003)
- I. Lukeš, L. D. Quin: "Direct Reaction of Phosphorus Acids with the Hydroxy Group on the Surface of Solids" US-Patent 5,756,792 (1998)

For more details see:

<http://web.natur.cuni.cz/anorchem/19>

