CENTER FOR RADIOPHARMACEUTICAL SCIENCES

Prof. Dr. Roger Schibli
Institute for Pharmaceutical Sciences
Department Chemistry & Applied Biosciences ETHZ
Vladimir-Prelog-Weg 1-5/10, 8093 Zürich
and
Paul Scherrer Institute
Center for Radiopharmaceutical Sciences, OIPA
5232 Villigen PSI

roger.schibli@pharma.ethz.ch & roger.schibli@psi.ch
www.chab.ethz.ch/en/research/institutes/IPW.html
http://zrw.web.psi.ch

KEYWORDS – PET/CT, SPET/CT, Theragnostics, radiotracer development, translational molecular imaging

SUMMARY & MISSION STATEMENT

The Center for Radiopharmaceutical Sciences - a joint endeavor of the ETH Zurich and the Paul Scherrer Institute (PSI) - creates novel radioactive drugs for non-invasive diagnosis and therapy of metastatic cancerous lesions and novel radiotracers for the visualization of molecular functions of the brain, the heart and tumors with the aim to transfer them in a clinical practice (*bench-to-bedside*).

OVERVIEW

The research of the CRS is devoted to the development of innovative, targeted tumor therapies using radioactively labeled molecules. This also includes non-invasive diagnosis with Single Photon Emission Tomography (SPECT) and Positron Emission Tomography (PET). Radiometal-labeled monoclonal antibodies, peptides and small molecules have proven to be valid for the detection and treatment of aggressive metastatic diseases. Critical issues we address with our research in the future are (i) to choose the most appropriate radionuclide, (ii) to improve the targeting efficacy of existing biomolecules, (iii) to reduce the radiation exposure of non-targeted tissue and organs. To this aim, the CRS is expanding the portfolio of diagnostic and therapeutic radionuclides such as ^{44}Sc for diagnosis and ^{161}Tb for therapy. We select suitable targets through collaborations with academic and industrial partners and optimize targeting molecules straightforward from bench-to-bedside with clinical partners in Switzerland and Europe. The CRS possesses cyclotrons, biological and chemical laboratories as well as pre-clinical imaging facilities. On top, we have Swissmedic-approved GMP laboratories at PSI and the ETHZ.

SELECTED CANCER RELATED PUBLICATIONS

Albumin-Binding PSMA Ligands: Optimization of the Tissue Distribution Profile. Benešová M, Umbricht CA, Schibli R, Müller C. **Mol Pharm.** 2018 Mar 5;15(3):934-946.

Novel peptide probes to assess the tensional state of fibronectin fibers in cancer. Arnoldini S, Moscaroli A, Chabria M, Hilbert M, Hertig S, Schibli R, Béhé M, Vogel V. **Nat Commun.** 2017 Nov 27;8(1):1793.

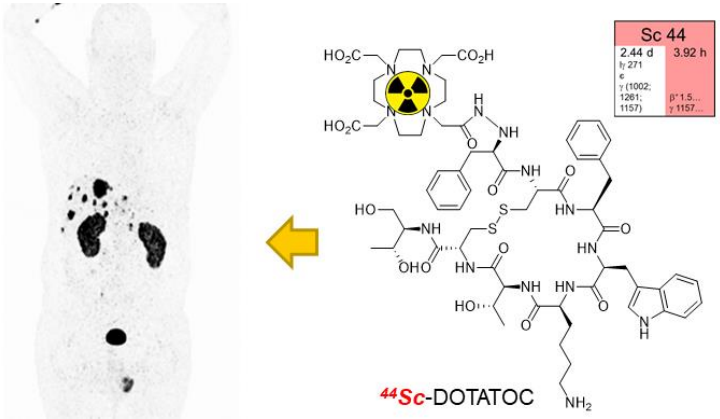
Therapeutic Radiometals Beyond 177Lu and ^{90}Y: Production and Application of Promising α-Particle, β$^-$-Particle, and Auger Electron Emitters. Müller C, van der Meulen NP, Benešová M, Schibli R. **J Nucl Med.** 2017 Sep;58(Suppl 2):91S-96S.

Dual, Site-Specific Modification of Antibodies by Using Solid-Phase Immobilized Microbial Transglutaminase. Spycher PR, Amann CA, Wehrmüller JE, Hurwitz DR, Kreis O, Messmer D, Ritler A, Küchler A, Blanc A, Béhé M, Walde P, Schibli R. **Chembiochem**. 2017 Oct 5;18(19):1923-1927.

First-in-Human PET/CT Imaging of Metastatic Neuroendocrine Neoplasms with Cyclotron-Produced ^{44}Sc-DOTATOC: A Proof-of-Concept Study. Singh A, van der Meulen NP, Müller C, Klette I, Kulkarni HR, Türler A, Schibli R, Baum RP. **Cancer Biother Radiopharm**. 2017 May;32(4):124-132.

Contribution of Auger/conversion electrons to renal side effects after radionuclide therapy: preclinical comparison of ^{161}Tb-folate and ^{177}Lu-folate. Haller S, Pellegrini G, Vermeulen C, van der Meulen NP, Köster U, Bernhardt P, Schibli R, Müller C. **EJNMMI Res.** 2016 Dec;6(1):13.

Cyclotron production of ^{44}Sc: From bench to bedside. van der Meulen NP, Bunka M, Domnanich KA, Müller C, Haller S, Vermeulen C, Türler A, Schibli R. **Nucl Med Biol.** 2015 Sep;42(9):745-51.



Clinical Whole-body PET image of a patient with extensive bi-lobar liver metastasis of a neuroendocrine cancer at 4 h after injection of ^{44}Sc-DOTATOC a novel radionuclide developed at the Center for Radiopharmaceutical Sciences at PSI (Singh et al. 2017, *Cancer Biother Radiopharm,* 32, 124).