

Rachele Stefania

Curriculum vitae

PERSONAL DATA

Born in Busto Arsizio (VA) on the 08.09.1976

Resident in Torino

e-mail: rachele.stefania@unito.it, rachele.stefania@uniupo.it

<https://orcid.org/0000-0002-8556-8556/print>

BIO AND EDUCATION

Dr. Rachele Stefania graduated in Pharmaceutical Chemistry and Technology, Faculty of Pharmacy, at the University of Turin, and obtained the title of PhD in 2007 (Dept. of Chemistry IFM, University of Turin) with a dissertation entitled "Synthesis and Validation of New Probes for Molecular Imaging using the MRI technique", under the supervision of Prof. S. Aime. From November 2007 until December 2013 she was a project collaborator and a research fellow in the research activity at the Molecular Imaging Center of the IFM Chemistry Department (University of Turin) in the context of the synthesis and characterization of new contrast agents for clinical diagnosis and new molecular imaging probes in order to identify pathological abnormalities at the genetic, cellular and molecular level. Since January 2014 she has been responsible for the organic and peptide synthesis laboratories at the Molecular Imaging Center of the Department of Molecular Biotechnology and Health Sciences (University of Turin). She currently holds the role of research technician in the implementation and activation of the chemical laboratory for the synthesis of imaging probes for the new Italian Node Euro-BioImaging MMMI (Multi Modal Molecular Imaging Italian Node). She is (co) author of 33 publications in international scientific journals

UNIVERSITY CAREER

2017-	Research technician, Molecular Imaging Center - Dept. of Molecular Biotechnology and Health Sciences University of Torino (IT)
2014-2016	Research fellow, Molecular Imaging Center - Dept. of Molecular Biotechnology and Health Sciences University of Torino (IT)
2007-2013	Research fellow Dept. of Chemistry IFM, University of Torino (IT)

MAIN FIELDS OF INTEREST

1. Synthesis of contrast agents for clinical diagnostics

2. Multimodal probes for molecular imaging
3. Probes for Imaging Guided Therapy
4. Functionalized Nanosystems for diagnostic and/ or theranostic applications

1. Synthesis of contrast agents for clinical diagnostics

Synthesis, characterization and biomedical applications of polyaminocarboxylic ligands whose metal complexes are used as contrast agents for Magnetic Resonance Imaging (MRI) or Positron Emission Tomography (PET). Design and synthesis of novel ligands for optimization of contrast agent efficiency. Synthesis of functionalized systems for bioconjugation to biological carriers.

2. Multimodal probes for molecular imaging

A molecular imaging probe allows the identification of pathological abnormalities at the genetic, cellular and molecular level. The chemical probe consists of a part responsible for the generation of the signal detected externally (eg. Gd- complexes for MRI and SPCCT, ⁶⁸Ga complexes for PET, fluorescent compounds for optical imaging) and a part responsible for the molecular recognition of the pathology, able to differentiate diseased from healthy tissues. Synthesis and characterization of peptides as potential receptor ligands thanks to their low molecular mass, ease of synthesis and low immunogenicity.

3. Probes for Imaging Guided Therapy

Design and synthesis of fluorescent probes with high tumor specificity, capable of assisting the surgeon in the procedures of complete tumor resection by increasing the visualization of the margins of the lesion itself and guiding the biopsy of unsuspected tissues near the primary lesion

4. Functionalized Nanosystems for diagnostic and/ or theranostic applications

Design and synthesis of biocompatible and biodegradable nanosystems of various nature: nanoparticles based on synthetic polymers such as PLGA (poly (lactic-co-glycolic acid) or on lipid-based nanocarriers, liposomes and micelles. These systems are used to accumulate a large number of contrast agents and deliver them to the site of interest to visualize a given pathology through diagnostic techniques such as MRI, Photoacoustic Imaging and Optical Imaging. Furthermore, if these particles are loaded with specific drugs they become theranostic (combination of diagnostics and therapy) and are useful for targeted and controlled release of drugs.

COLLABORATIONS

- Ephoran Multi-Imaging Solution, company focused on preclinical research and development
- Bracco Imaging S.p.A., one of the world leaders of diagnostic agents located at the BioIndustry Park of Canavese (Ivrea, TO)

TOP FIVE PAPERS

1. R. Stefania, L. Tei, A. Barge, S. GeninattiCrich, I. Szabo, C. Cabella, G. Cravotto, Silvio Aime. Tuning Glutamine Binding Modes in Gd-DOTA-Based Probes for an Improved MRI Visualization of Tumor Cells. *Chem. Eur. J.*, **2009**, 15, 76–85

2. Pagoto, R. Stefania, F. Garelo, F. Arena, G. Digilio, S. Aime, E. Terreno. Paramagnetic Phospholipid-Based Micelles Targeting VCAM-1 Receptors for MRI Visualization of Inflammation. *Bioconjugate Chem.*, **2016**, 27, 1921–1930
3. M. Tripepi, F. Capuana, E. Gianolio, F. V. C. Kock, A. Pagoto, R. Stefania*, G. Digilio, S. Aime. Synthesis of High Relaxivity Gadolinium AAZTA Tetramers as Building Blocks for Bioconjugation, *Bioconjugate Chem.*, **2018**, 29(4), 1428-1437.
4. Capozza, M., Stefania, R. , Rosas, L., Arena, F., Consolino, L., Anemone, A., ... & Aime, S. An Improved Biocompatible Probe for Photoacoustic Tumor Imaging Based on the Conjugation of Melanin to Bovine Serum Albumin. *Applied Sciences*, **2020**, 10(23), 8313.
5. Baroni, S., Stefania, R. , Broche, L. M., Senn, N., Lurie, D. J., Ross, P. J., ... & Geninatti Crich, S. A Novel Class of ^1H -MRI Contrast Agents Based on the Relaxation Enhancement Induced on Water Protons by ^{14}N -Containing Imidazole Moieties. *Angewandte Chemie*, **2021**, 133(8), 4254-4260