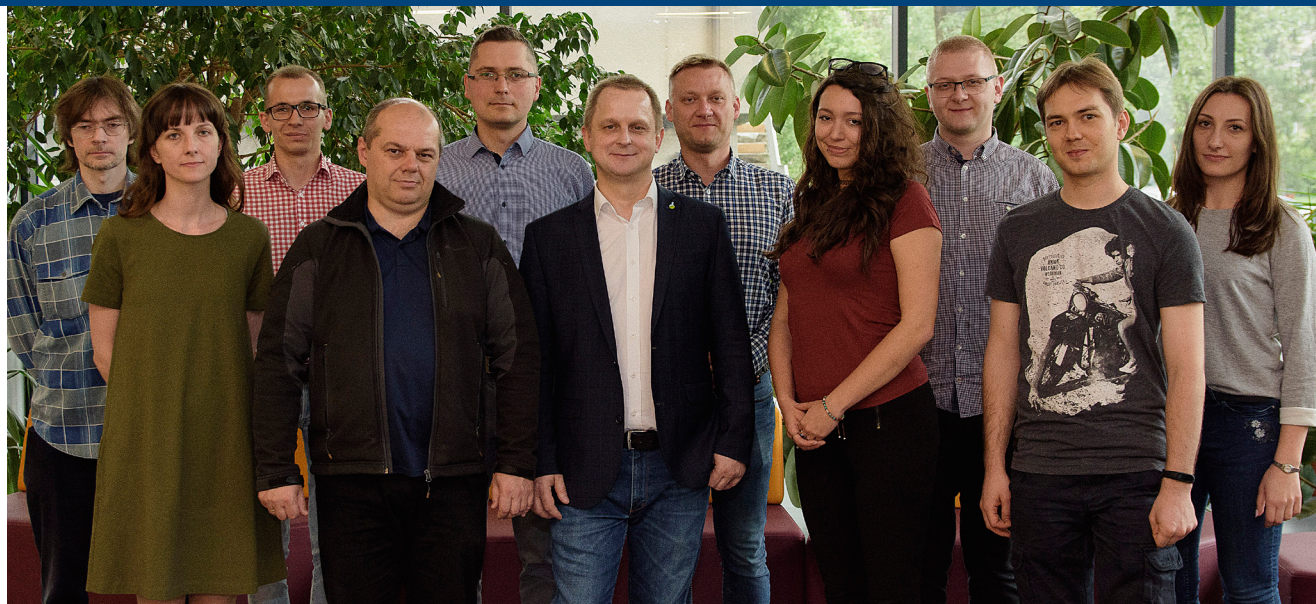


# Radiochemistry for Medicine and Industry



## HEAD:

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## RESEARCH PROFILE:

Our group's research interests lie in three main areas: 1. application of radioisotopes in medicine, in particular, studying the affinity of chemical substances to body tissues, 2. monitoring of radioactive wastes 3. Energy storage and transformation: batteries, fuel cells.

## CURRENT RESEARCH ACTIVITIES:

We closely cooperate with industry therefore most of our inventions have multiple industrial applications. Our group members conduct pre-clinical research on pharmaceuticals and radiopharmaceuticals using PET/SPECT/CT techniques, they also modify and recycle electrochemical power sources and study the phenomena of oxidation of precious and base metals. The group has modern and unique equipment at its disposal which enables world-class research in the field of molecular imaging, synthesis of radioisotope-tagged compounds and studying materials used in electrochemical power sources. The equipment includes: three-module PET/CT/SPECT scanner, a system of individually ventilated cages (IVC) for mice and rats, hot cells, isotope generators and modules for the synthesis and portioning of radioisotope-labelled compounds (among others  $^{18}\text{F}$ ,  $^{64}\text{Cu}$ ,  $^{68}\text{Ga}$ ), a quality control system for radiopharmaceuticals, an EDXRF X-ray fluorescence spectrometer for quantitative and qualitative analysis of samples, equipment for spectroelectrochemical tests (UV-vis spectrometers, potentiostats), potentiostats, galvanostats and battery testers.

## SELECTED PUBLICATIONS:

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2. M. Grdeń, G. Jerkiewicz, Influence of Surface Treatment on the Kinetics of the Hydrogen Evolution Reaction on Bulk and Porous Nickel Materials, *Electrocatalysis*. 10 (2019) 173-183.
3. Ł. Kiraga, Ł. Cheda, B. Taciak, K. Różańska, K. Tonecka, A. Szulc, K. Kilian, E. Górka, Z. Rogulski, T. P. Rygiel, M. Król, Changes in hypoxia level of CT26 tumors during various stages of development and comparing different methods of hypoxia determination, *PLoS ONE*. 13 (2018).
4. M. Ciebiera, J. Szymańska-Majchrzak, A. Sentkowska, K. Kilian, Z. Rogulski, G. Nowicka, G. Jakiel, P. Tomaszewski, M. Włodarczyk, Alpha-Tocopherol Serum Levels Are Increased in Caucasian Women with Uterine Fibroids: A Pilot Study, *BioMed Research International*. (2018) 6793726.
5. K. Kilian, Ł. Cheda, M. Sitarz, K. Szkliniarz, J. Choiński, A. Stolarz, Separation of  $^{44}\text{Sc}$  from Natural Calcium Carbonate Targets for Synthesis of  $^{44}\text{Sc}$ -DOTATATE, *Molecules*. 23 (2018) 1787.
6. M. Chotkowski, M. Grdeń, B. Wrzosek, Intermediate oxidation states of technetium in alkaline solutions, *Journal of Electroanalytical Chemistry*. 829 (2018) 148-156.
7. M. Pruszyński, M. D'Huyvetter, F. Bruchertseifer, A. Morgenstern, T. Lahoutte, Evaluation of an Anti-HER2 Nanobody Labeled with  $^{225}\text{Ac}$  for Targeted  $\alpha$ -Particle Therapy of Cancer, *Molecular Pharmaceutics*. 15 (2018) 1457-1466.
8. M. Chotkowski, D. Połomski, Extraction of pertechnetates from  $\text{HNO}_3$  solutions into ionic liquids, *Journal of Radioanalytical and Nuclear Chemistry*. 314 (2017) 87-92.
9. M. Grdeń, Impedance study on the capacitance of silver electrode oxidised in alkaline electrolyte, *Journal of Solid State Electrochemistry*. 21 (2017) 3333-3344.
10. M. Grdeń, Platinum oxidation in alkaline electrolyte under potentiostatic conditions, *Electrochemistry Communications*. 61 (2015) 14-17.