

Department of Microbioanalytics

Laboratory of

ISEs, BIOSENSORS and THEIR APPLICATION in FIA SYSTEMS



Current research works

- Studies on enzymatic or immunologic reactions and ssDNA hybridization as a base for bioanalytes detection
- Receptors and bioreceptors for selective recognition of ions and biomolecules
- (Bio)sensors with polymeric ion-selective membranes, using potentiometric or optical transduction mode
- Design and fabrication of novel silicon-based transducers for potentiometric and voltammetric measurements
- Intermediate layers (hydrogels, conducting polymers, self-assembled monolayers) for miniaturized ion-selective electrodes
- Enzymatic flow-injection analysis systems for determination of bioanalytes
- Self-assembled monolayers of oligonucleotides as receptor layers for DNA sensors.
- Development of electroactive self-assembling monolayers

Selected publications

- M. Mroczkiewicz, Ł. Górski, A. Zamojska-Jaroszewicz, K. Szewczyk, E. Malinowska, **Application of flow-injection potentiometric system for determination of total concentration of aliphatic carboxylic acids**, *Talanta* (2011), DOI: 10.1016/j.talanta.2011.07.041
- M. Mroczkiewicz, M. Pietrzak, Ł. Górski, E. Malinowska, **Optical acetylcholine sensor based on free base porphyrin as a chromoionophore**, *Analyst* (2011), DOI: 10.1039/c0an00965b
- R. Ziólkowski, Ł. Górski, M. Zaborowski, E. Malinowska, **Application of mass fabricated silicon-based gold transducers for amperometric biosensors** *Bioelectrochem.* 80 (2010) 31
- Ł. Górski, A. Matusevich, P. Parzuchowski, I. Łuciuk, E. Malinowska **Fluoride-selective polymeric membrane electrodes based on Zr(IV)- and Al(III)-salen ionophores of various structures** *Anal. Chim. Acta* 665 (2010) 39
- Ł. Górski, M. Mroczkiewicz, M. Pietrzak, E. Malinowska **Metalloporphyrin-based acetate-selective electrodes as detectors for enzymatic acetylcholine determination in flow-injection analysis system** *Anal. Chim. Acta* 644 (2009) 30
- Ł. Górski, M. Mroczkiewicz, M. Pietrzak, E. Malinowska **Complexes of tetra-tert-butyl-tetraazaporphine with Al(III) and Zr(IV) cations as fluoride selective ionophores** *Anal. Chim. Acta* 633 (2009) 181

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Research profile

Ion-selective membranes: new ionophores for hydrophilic anions, novel polymeric matrices compatible with transducers

Development of solid state sensors of appropriate architecture: ion-selective membrane/ion-electron conductive intermediate layer/potentiometric transducer

Recognition layers for biosensing based on self-assembled aptamers/ oligonucleotides or immobilized enzymes

Miniaturization of transducers based on silicon technology for electrochemical (bio)sensors

Application of FIA systems for **bioanalyte determination**