Łukasz **Półtorak**

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lpoltorak.wordpress.com/home/about-me/ | scholar.google.pl/citations?user=QduQPiEAAAAJ&hl=pl |

lukaszpoltorak | 0000-0002-8799-8461 | Scopus bibliometric data: citations **832** · documents **67** · h-index **18**

Currently held positions

Department of Inorganic and Analytical Chemistry, Faculty of Chemistry *University of Lodz*

Associate Professor

Electrochemistry@Soft Interfaces Team, Faculty of Chemistry *University of Lodz*

Team leader

Scientific profile and collaborations

Scientific profile: The scientific profile of my group (Electrochemistry@Sotf Interfaces – E@SI) is based on electrochemical bedrocks. We are particularly interested in studying charge transfer processes at a variety of phase boundaries. These cover (i) electrified liquid-liquid interface known as the interface between two immiscible electrolyte solutions; (ii) biomimetic systems defined by lipidic structures; (iii) micro- and nanoscopic electrified systems; (iv) 3D printing for electrochemical application (aspect covering formulation of materials, object designs, and functional printouts); (v) electrochemistry driven material synthesis; (vi) electrochemically assisted deposition reactions; (vii) interfacial polycondensation reactions; (viii) oxygen reduction reaction; (ix) ion transfer processes across polymeric membranes; or (x) single entity electrochemistry. These fundamental aspects find many applications that we translated into scientific publications, patents, and knowledge, which is directly translated into the private sector. Our philosophy is to translate well-understood fundamental knowledge into practical applications. Some of our recent discoveries cover (a) a set of electrochemical sensors for the detection of narcotic substances such as cocaine, heroin, cocaine metabolites, amphetamine, and methamphetamine directly from the street samples; (b) preparation of printable materials that can be used as components of electroanalytical platforms or (c) a number of simple and cheap fabrication protocols allowing for miniaturized electrified systems preparation.

Collaboration: We cooperate with scientists from different scientific disciplines distributed among a few continents. Our partners can be found in France, Czech Republic, Lithuania, and Poland. We are currently setting up the cooperation with scientist from Australia, South Korea and Canada.

Selected publications

2017 ***Decorating soft electrified interfaces: From molecular assemblies to nano-objects*** **[link]**

2018 ***Electrified soft interface as a selective sensor for cocaine detection in street samples*** **[link]**

2022 ***Illicit drugs street samples and their cutting agents. The result of the GC-MS based profiling define the guidelines for sensors development*** **[link]**

Research grants

Principal Investigator: 5 grants: Sonata, PreludiumBis x2, Polonium, MNiSW

Project Coordinator: 2 grants: MSCA IF European Commisssion's, PolonezBis

Co-Investigator: 7 grants: NanoNextNL, NCN

Obtained patents

3 patents granted by Polish Patent Office

2 registered European Trademarks

International research stays

France, LCPME, Université de Lorraine

The Netherlands, Faculty of Chemical Engineering, Delft University of Technology