

## Assoc. Prof. Paweł Ł. Urban



Paweł Urban received his MSc degree in Biology from the University of Warsaw in 2002, and PhD degree in Chemistry from the University of York in 2008. His PhD thesis focused on the development of in-capillary enzyme assays using ultraviolet imaging detection. He also conducted research stays in the University of Alcala and the University of Warsaw. From 2008 to 2010, he was postdoctoral researcher in the Swiss Federal Institute of Technology (ETH Zurich), where he developed microarrays for mass spectrometry, and demonstrated suitability of this technique for single-cell metabolite analyses. In 2011, Prof. Urban was appointed as assistant professor in the Department of Applied Chemistry at the National Chiao Tung University, and in 2015, was promoted to associate professor. Since

2017 he has been leading biochemical analysis research team in the Department of Chemistry at the National Tsing Hua University.

Prof. Urban authored or co-authored about 80 publications in peer-reviewed scientific journals. He also co-authored one monograph: “Time-Resolved Mass Spectrometry: From Concept to Applications” (Wiley). He is editorial board member in 2 journals: *Scientific Reports* (NPG) and *HardwareX* (Elsevier). In 2016, he was guest editor of a theme issue dedicated to quantitative mass spectrometry of *Philosophical Transactions A* (Royal Society). He is member of several academic organizations: Chemical Society Located in Taipei, American Association for Clinical Chemistry, Royal Society of Chemistry, American Society for Mass Spectrometry, Marie Curie Fellows Association, and Marie Curie Alumni Association. He holds the status of Chartered Chemist (RSC) and Chartered Scientist (Science Council, UK). In 2014, he received the Outstanding Young Chemist Award from the Chemical Society Located in Taipei; in 2015, Junior Faculty Research Award in Science from the College of Science, in the NCTU; and in 2017, teaching award from the NCTU.

The Urban’s team research focuses on the development of enabling analytical technologies, their applications, as well as fundamental studies. The research program revolves around the subjects of mass spectrometry, clinical chemistry, metabolomics, autochemistry, and luminescence. In the past six years, Urban’s team developed or further developed several concepts including: cool mist scavenging, plug-volume-modulated dilution, imaging-based microgasometry, fizzy extraction of molecules into gas phase, biochemical timer reaction, 1D, 2D and 3D spectral imaging of chemical reactions, robotics-assisted mass spectrometry assay (RAMSAY), droplet-in-oil fusion for microscale chemical assays, 3D-printed digital microfluidic interface for mass spectrometry, hydrogel micropatch sampling for skin metabolomics, micropatch-arrayed pads (MAPA) for profiling topical drugs on skin surface, mass spectrometric analysis of enzymatic reaction-diffusion waves, and mass spectrometric imaging of single filamentous cells. They also popularized the use of open-source hardware (*e.g.* Arduino, single-board computers) in chemistry. The research in this direction yielded developments in automated control of biochemical reactions, internet-of-things for analytical chemistry, and automation of extractions coupled on-line with mass spectrometry.