

# Analytical Microsystems Research Group



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### HEAD:

Łukasz Tymecki\*, PhD DSc

### GROUP MEMBERS:

Michał Michalec, MSc

PhD students: Mateusz Granica,  
Izabela Lewińska

### RESEARCH PROFILE:

Designing, optimization (miniaturization, maintenance free operation) and validation of analytical systems targeted towards various analytes relevant from clinical point of view and focused on practical use.

### CURRENT RESEARCH ACTIVITIES:

Novel detection schemes, useful in clinical diagnostics. Optical and electrochemical sensors. Micro- and mesofluidic analytical systems. Mechanization and automation of analytical procedures. Lab-on-LED, Lab-on-Paper, Lab-on-Smarthone, Lab-on-Valve, Point-of-Care testing. Monitoring of hemodialysis. Rapid prototyping (3D printing) for analytical laboratory. Development of fit-to-purpose prototypes.

### SELECTED PUBLICATIONS:

1. I. Lewińska, Ł. Tymecki, M. Michalec, An alternative, single-point method for creatinine determination in urine samples with optoelectronic detector. Critical comparison to Jaffé method, *Talanta*. 195 (2019) 865-869.
2. M. Granica, Ł. Tymecki, Analytical aspects of smart (phone) fluorometric measurements, *Talanta*. 197 (2019) 319-325.
3. D.J. Cocovi-Solberg, M. Rosende, M. Michalec, M. Miró, 3D Printing: The Second Dawn of Lab-On-Valve Fluidic Platforms for Automatic (Bio)Chemical Assays, *Analytical Chemistry*. 91 (2019) 1140-1149.
4. M. Michalec, Ł. Tymecki, 3D printed flow-through cuvette insert for UV-Vis spectrophotometric and fluorescence measurements, *Talanta*. 190 (2018) 423-428.
5. M. Granica, M. Fiedoruk-Pogrebniak, R. Koncki, Ł. Tymecki, Flow Injection Analysis in Lab-On-Paper format, *Sensors and Actuators, B. Chemical*. 257 (2018) 16-22.
6. M. Michalec, Ł. Tymecki, Multicommutated systems for analytical control of hemodialysis treatments (Book Chapter), in: *Flow and Capillary Electrophoretic Analysis*. (2018) 237-258.

7. M. Michalec, M. Granica, J. Bzura, R. Koncki, J. Matuszkiewicz-Rowińska, Ł. Tymecki, Optoelectronic detectors and flow analysis systems for determination of dialysate urea nitrogen, *Sensors and Actuators, B: Chemical*. 226 (2016) 563-56.
8. Ł. Tymecki, M. Pokrzywnicka, R. Koncki, Paired emitter detector diode (PEDD)-based photometry – An alternative approach, *Analyst*. 133 (2008) 1501-1504.
9. Ł. Tymecki, E. Zwierkowska, R. Koncki, Screen-printed reference electrodes for potentiometric measurements, *Analytica Chimica Acta*. 526 (2004) 3-11.