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Marius Dagys

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WORK EXPERIENCE

Head of Department / Senior Research Associate

Institute of Biochemistry, Life Sciences Center, Vilnius university [30/09/2011 – Current]

Address: Saulėtekio str. 7, LT-10257 Vilnius (Lithuania) - www.gmc.lt

Research of bioelectrocatalytic systems (biofuel cells, bioconversion systems) and biosensors.

CEO and co-founder

UAB "Bioanalizės sistemos" [30/06/2014 – Current]

Address: Vilnius

Researcher

Department of Health and Society of Malmö university [30/04/2008 – 30/12/2008]

Address: Universitetssjukhuset MAS, Ing 49, 205 06 Malmö (Sweden) - www.mah.se

Biofuel cell research funded by Bioanalytical electrochemistry and bionanotechnology project "BIONEL" - Marie Curie EST Lund university section" (Sweden).

Researcher

Lithuanian Reseach Center, LLC [02/10/2011 – 30/05/2013]

Address: Gedimino pr. 2 / Odminių g. 1, LT-01103 Vilnius (Lithuania)

- **Business or sector:** Professional, scientific and technical activities

Expertise of ongoing scientific projects, application and implementation of project "Search of new and genetically modified oxidoreductases for creation of biofuel cells", funded by Agency for Science, Innovation and Technology, Lithuania

PhD student

Institute of Biochemistry, Vilnius university [30/09/2007 – 26/09/2012]

Address: Mokslininkų str. 12, LT-08662 Vilnius (Lithuania) - www.bchi.vu.lt

Research of biofuel cells consisting of multicopper oxidases adsorbed on nanostructured electrode surfaces.

EDUCATION AND TRAINING

PhD of biochemistry, physical sciences

Institute of Biochemistry, Vilnius university [30/09/2007 – 29/09/2011]

Address: Vilnius (Lithuania)

Field(s) of study: Physical sciences

Defended PhD thesis "Function of multicopper oxidases adsorbed on gold nanoparticles". Scientific supervisor - prof. Juozas Kulys.

Master of biochemistry

Vilnius university [31/08/2005 – 30/05/2007]

Address: Vilnius (Lithuania)

Defended master thesis „Synthesis of modified chitosan redox active polymers and their application in bioelectrocatalytic systems".

LANGUAGE SKILLS

Mother tongue(s): **Lithuanian**

Other language(s):

English	Russian
LISTENING C1 **READING** C1 **WRITING** C1	**LISTENING** B1 **READING** A2 **WRITING** A1
SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1	**SPOKEN PRODUCTION** B2 **SPOKEN INTERACTION** B1

PROJECTS MANAGED DURING LAST 5 YEARS

Creation of biosensor research and engineering competence and technology transfer center (BIOSENSE)

[2020 – Current]

Project funded by European Regional Development Fund according to the supported activity „Research Projects Implemented by World-class Researcher Groups" under Measure No. 01.2.2-CPVAK-703. Budget - 997 000 Eur

Creation of enzymatic electrochemical system for determination of maltose and amylase (AmalSense)

[2021 – Current]

Project funded by Agency for Science, Innovation and Technology under "Development of biotechnology industry in Lithuania" program, applicant - UAB Bioanalizės sistemos.

Biocatalytic systems for conversion of non-starch poly- and oligosaccharides

[2018 – 2022]

Project funded by European Regional Development Fund according to the supported activity „Research Projects Implemented by World-class Researcher Groups" under Measure No. 01.2.2-LMTK-718. Budget - 699 000 Eur, ended successfully.

Development of analyzer for measuring carbamide nitrogen part in industrial fertilizer samples

[2014 – 2016]

Project funded by Agency for Science, Innovation and Technology. Budget - 68 000 Eur, ended successfully.

PROJECTS PARTICIPATED IN DURING LAST 5 YEARS

Creation of technology for bioelectrochemical creatinine sensor

[2021 – Current]

Project funded by Agency for Science, Innovation and Technology under "Development of biotechnology industry in Lithuania" program, applicant - UAB Heksimus, partner - UAB Bioanalizės sistemos.

Creation of technology for electrochemical sensor for nuclease activity detection

[2021 – Current]

Project funded by Agency for Science, Innovation and Technology under "Development of biotechnology industry in Lithuania" program, applicant - UAB Laboratorija 1, partner - UAB Bioanalizės sistemos.

Biosensor platform for fast, cheap and accurate determination of amino acids, suited for patients undergoing renal therapy

[2020 – Current]

Project funded by European Regional Development Fund according to the supported activity „Research Projects Implemented by World-class Researcher Groups" under Measure No. 01.2.2-LMTK-718. Budget - 699 000 Eur.

Supramolecular recognition-based sensors for electro- detection of biomolecules

[2020 – 2022]

Project funded by Research Council of Lithuania under Researcher Group projects framework, project No. S-MIP-20-45. Project ended successfully.

Development of non-invasive method platform for early diagnostics and prognosis of acute pancreatitis

[2018 – 2022]

Project funded by European Regional Development Fund according to the supported activity „Research Projects Implemented by World-class Researcher Groups" under Measure No. 01.2.2-LMTK-718. Budget - 699 000 Eur, final project report under evaluation.

MANAGEMENT AND LEADERSHIP SKILLS

Head of Bioanalysis Department

Since 2019 - elected for managing the Bioanalysis Department of Institute of Biochemistry of Life Sciences center of Vilnius University, consisting of 2 professors-emeritus, 11 research associates, 3 PhD students, 4 technicians, and additional bachelor and master students.

PhD students

- Skomantas SERAPINAS, 2020-10-01 / 2024-09-30, study subject - development of biosensors for measurement of low-concentration analytes
- Martynas KATELYNAS, 2020-10-01 / 2024-09-30, study subject - development of biosensors for remote environmental monitoring

PUBLICATIONS

10 most important publications for the last 5 years (newest -> oldest)

1. Serapinas, S.; Gineitytė, J.; Butkevičius, M.; Danilevičius, R.; **Dagys, M.**; Ratautas, D. Biosensor prototype for rapid detection and quantification of DNase activity. *Biosensors and Bioelectronics* 2022, 213, 114475. IF: 12.545.
2. Ramonas, E.; Butkevičius, M.; Shleev, S.; **Dagys, M.**; Ratautas, D. Mechanistic characterization of an oxygen reduction reaction-driven, fully enzymatic and self-calibrating pH biosensor based on wired bilirubin oxidase. *Sensors and Actuators B: Chemical* 2022, 367, 132054. IF: 9.221.
3. Shafaat, A.; Žalnėravičius, R.; Ratautas, D.; **Dagys, M.**; Meškys, R.; Rutkienė, R.; Gonzalez-Martinez, JF.; Neilands, J.; Bjorklund, S.; Sotres, J.; Ruzgas, T. Glucose-to-Resistor Transduction Integrated into a Radio-Frequency Antenna for Chip-less and Battery-less Wireless Sensing. *ACS Sensors* 2022, 7(4), 1222-1234. IF: 9.618.
4. Tetianec, L.; Bratkvoskaja, I.; Časaitė, V.; Gurevičienė, V.; Razumienė, J.; Stankevičiūtė, J.; Meškys, R.; **Dagys, M.**; Laurynėnas, A. Efficient Bi-enzymatic synthesis of aldonic acids. *Green Chemistry* 2022, 24, 4902-4908. IF: 11.034.

5. Ramonas, E.; Shafaat, A.; **Dagys, M.**; Ruzgas, T.; Ratautas, D. Revising catalytic “acceleration” of enzymes on citrate-capped gold nanoparticles. Journal of Catalysis 2021, 404, 570-578. IF: 8.047.
6. Gružauskaitė, J.; Jasinskaitė, J.; Meškys, R.; Gaidamavičienė, G.; Žalga, A.; Laurynėnas, A.; Tetianec, L.; **Dagys, M.** Gold-coated magnetic nanocatalyst containing wired oxidoreductases for mediatorless catalysis of carbohydrate oxidation by oxygen. *Catalysis Communications* 2020, 135, 105848. IF: 3.626.
7. Gineitytė, J.; Meškys, R.; **Dagys, M.**; Ratautas, D. Highly Efficient Direct Electron Transfer Bioanode Containing Glucose Dehydrogenase Operating in Human Blood. *Journal of Power Sources* 2019, 441, 227163. IF: 8.247.
8. Laurynėnas, A.; Butkevičius, M.; **Dagys, M.**; Shleev, S.; Kulys, J. Consecutive Marcus Electron and Proton Transfer in Heme Peroxidase Compound II-Catalysed Oxidation Revealed by Arrhenius Plots. *Scientific Reports* 2019, 9(1), 1. IF: 3.998.
9. Ramonas, E.; Ratautas, D.; **Dagys, M.**; Meškys, R.; Kulys, J. Highly sensitive amperometric biosensor based on alcohol dehydrogenase for determination of glycerol in human urine. *Talanta* 2019, 200(1), 333-339. IF: 5.339.
10. **Dagys, M.**; Laurynėnas, A.; Ratautas, D.; Kulys, J.; Vidžiūnaitė, R.; Talaikis, M.; Niaura, G.; Marcinkevičienė, L.; Meškys, R.; Shleev, S. Oxygen electroreduction catalysed by laccase wired to gold nanoparticles *via* the trinuclear copper cluster. *Energy & Environmental Science* 2017, 10, 498-502. IF: 30.067.

Other ISI WOS publications

- Bartusevičienė, I.; Vicka, V.; Vickienė, A.; Tetianec, L.; **Dagys, M.**; Ringaitienė, D.; Klimašauskas, A.; Šipylaitė, J. Conceptual model of adding antibiotics to dialysate fluid during renal replacement therapy. *Scientific Reports* 2021, 11, 23836. IF: 4.996.
- Ratautas, D.; **Dagys, M.** Nanocatalysts containing direct electron transfer-capable oxidoreductases: Recent advances and applications. *Catalysts* 2020, 10(1), 9. IF: 4.146.
- Ratautas, D.; Laurynėnas, A.; **Dagys, M.**; Marcinkevičienė, L.; Meškys, R.; Kulys, J. High current, low redox potential mediatorless bioanode based on gold nanoparticles and glucose dehydrogenase from *Ewingella americana*. *Electrochimica Acta* 2016, 199, 254-260. IF: 4.798.
- **Dagys, M.**; Lamberg, P.; Shleev, S.; Niaura, G.; Bachmatova, I.; Marcinkeviciene, L.; Meskys, R.; Kulys, J.; Arnebrant, T.; Ruzgas, T. Comparison of bioelectrocatalysis at *Trichaptum abietinum* and *Trametes hirsuta* lac case modified electrodes, *Electrochimica Acta* 2014, 130, 141-147. IF: 4.504.
- **Dagys, M.**; Haberska, K.; Shleev, S.; Arnebrandt, T.; Kulys, J.; Ruzgas, T. Laccase - gold nanoparticle assisted bioelectrocatalytic reduction of oxygen. *Electrochemistry Communications* 2010, 12(7), 933 – 935. IF: 4.287.
- Haberska, K.; Vaz-Dominguez, C.; De Lacey, A. L.; **Dagys, M.**; Reimann, C. T.; Shleev, S. Direct electron transfer reactions between human ceruloplasmin and electrodes. *Bioelectrochemistry* 2009, 76, (1-2), 34 - 41. IF: 2.652.
- Tetianec, L.; **Dagys, M.**; Kulys, J.; Ziemys, A.; Meskys, R. Study of the reactivity of quinohemoprotein alcohol dehydrogenase with heterocycle-pentacyanoferrate(III) complexes and the electron transfer path calculations. *Central European Journal of Biology* 2007, 2, (4), 502 - 517. IF: 0.71.

INTELLECTUAL PROPERTY

Patent applications (EPO)

- Butkevičius, M.; Gurevičienė, V.; Razumienė, J.; Laurynėnas, A.; **Dagys, M.** α-amylase activity biosensor. EPO application number: EP22197010.6, applicant - UAB "Bioanalizės sistemos", 2022.
- Ratautas, D.; Serapinas, S.; Gineitytė, J.; Butkevičius, M.; Danilevičius, R.; **Dagys, M**. Electrochemical system for the rapid and sensitive detection and quantification of nuclease-like activity exhibiting enzymes. EPO application number: EP22150566.2, applicants - UAB "Bioanalizės sistemos", UAB "Laboratorija 1", 2022.
- Laurynėnas, A.; Tetianec, L.; Bratkovskaja, I.; Časaitė, V.; Stankevičiūtė, J.; Meškys, R.; **Dagys, M.** Process for producing aldonic acids. EPO application number: EP22154819.1, applicant - Vilnius University, 2022.
- Ramonas, E.; Butkevičius, M.; **Dagys, M.**; Ratautas, D. Enzymatic self-calibrating biosensor for continuous pH monitoring. EPO application number: EP21203942.4, applicant - Vilnius University, 2021.

JOB-RELATED SKILLS

Job-related skills

Work experience with equipment: general spectroscopy and electrochemistry, fluorescence spectroscopy, spectroelectrochemistry, SEM, AFM, surface - enhanced Raman scectroscopy and other related laboratory

equipment and methods.
Design and construction of microprocessor-controlled electronic analytical systems.