Dajana Vuckovic

Department of Chemistry and Biochemistry
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EMPLOYMENT HISTORY

Associate Professor, Department of Chemistry and Biochemistry — Jun 2018–present
Concordia University, Montréal, Canada

Director, Centre for Biological Applications of Mass Spectrometry — Jun 2017–present
Concordia University, Montréal, Canada

Scientific Lead, Clinical Analysis Suite, PERFORM Centre — Jul 2015 – present
Concordia University, Montréal, Canada

Assistant Professor, Department of Chemistry and Biochemistry — Dec 2012–May 2018
Concordia University, Montréal, Canada

LC-MS Lab Manager, Pawliszyn Group (simultaneous with Ph.D. studies) — Sep 2006–Apr 2010
Department of Chemistry, University of Waterloo, Waterloo, Canada

Analyst 2, R&D and Validation
SGS Life Sciences, Mississauga, Canada — Jan 2004–Aug 2005

Analyst, Health Sciences
Bodycote Materials Testing Canada Inc., Mississauga, Canada — Jun 2002–Oct 2003

ACADEMIC BACKGROUND

Postdoctoral Fellow (Supervisor: Dr. Andrew Emili)
Centre for Cellular and Biomolecular Research, University of Toronto, Canada — May 2010–Nov 2012

Doctor of Philosophy, Chemistry (direct transfer from M.Sc.)
University of Waterloo, Waterloo, Canada — Apr 2010
Dissertation: Solid-phase microextraction as sample preparation method for metabolomics
Advisor: Janusz Pawliszyn, External examiner: Dr. Milos Novotny

Honours Bachelor of Science, Chemistry Specialist Program (Graduated with Distinction)
University of Toronto, St. George Campus, Toronto, ON, Canada — Jun 2002

HONOURS AND AWARDS SINCE 2010 (21 TOTAL)

- Eastern Analytical Symposium Young Investigator Award, 2020
- Canadian Society for Mass Spectrometry (CSMS) Young Investigator Award, 2019
- CNC-IUPAC Travel Award, Canadian National Committee for the International Union of Pure and Applied Chemistry, 2019
- Dean's Award for Excellence in Scholarship (Junior), Concordia University, 2018
- Young Investigator Travel Award, Mass Spectrometry: Applications to the Clinical Lab (MSACL) 2017 Conference, 2017
- FRQS Chercheur Boursier Junior 1, 2016–2020
- Concordia University Research Chair in Clinical Metabolomics, Biomarkers and Preventative Health (New Scholar), 2016–2021
- Petro-Canada Young Innovator Award - Technology, Industry and the Environment, Concordia University, 2014
- NSERC Postdoctoral Fellowship, Natural Sciences and Engineering Research Council of Canada, 2010–2012
- F.W. Karasek Scholarship Award, Guelph-Waterloo Centre for Graduate Work in Chemistry & Biochemistry, 2010
- Analytical Chemistry Division of the Canadian Society for Chemistry Analytical Chemistry Student Award in

honour of Douglas E. Ryan, 2010

- Johnson & Johnson Young Scientist Scholarship, HTC-11 and HTSP conference, 2010

PEER-REVIEWED PUBLICATIONS SINCE 2010 (43 TOTAL, * TRAINEES)

1. Russo, M.*, Napylov, A.*, Paquet, A.*, **Vuckovic, D.**, Comparison of N-ethyl maleimide and N-(1-phenylethyl) maleimide for derivatization of biological thiols using liquid chromatography-mass spectrometry, *Anal. Bioanal. Chem.* 412, 1639-1652, (2020).
2. Napylov, A*., Reyes Garces, N., Gomez-Rios, G., Monnin C.*, Olkowicz, M., Lendor, S., Bojko, B., Hamani, C., Pawliszyn, J., **Vuckovic, D**., In vivo solid-phase microextraction for sampling of oxylipins in brain of awake, moving rats, *Angew. Chem. Int. Ed.* 59(6), 2392-2398, (2020).
3. Ye, Q., Chourey, S., Reddy, C.N., Wang R., Cossette, C., Gravel, S., Slobodchikova, I.*, **Vuckovic, D.**, Rokach, J., Powell, W.S., Novel highly potent OXE receptor antagonists with prolonged plasma lifetimes that are converted to active metabolites in vivo in monkeys, *British J. Pharmacol.* 177, 388-401, (2020).
4. Sonnenberg, R.*, Naz, S.*, Cougnaud, L.*, **Vuckovic, D.**, Comparison of underivatized silica and zwitterionic sulfobetaine hydrophilic interaction liquid chromatography stationary phases for global metabolomics of human plasma, accepted, *J. Chromatogr. A* 1608, 460419, (2019).
5. Slobodchikova, I.*, Sivakumar, R.*, Md Rahman, S.*, **Vuckovic, D**. Characterization of phase I and glucuronide phase II metabolites of 17 mycotoxins using liquid chromatography – high-resolution mass spectrometry, *Toxins*, 11(8), 433; https://doi.org/10.3390/toxins11080433, (2019).
6. Chourey, S., Ye, Q., Reddy, C.N., Wang, R., Cossette, C., Gravel, S., Slobodchikova, I.*, **Vuckovic, D.**, Rokach, J. & Powell, W.S., Novel highly potent and metabolically resistant OXE receptor antagonists that block the actions of 5-oxo-6,8,11,14-eicosatetraenoic acid, *J. Med. Chem.* 61, 5934–5948 (2018).
7. **Vuckovic, D.** Improving metabolome coverage and data quality: advancing metabolomics and lipidomics for biomarker discovery, *Chem. Comm.* 54, 6728-6749 (2018, **invited feature for Emerging Investigators Issue 2018**).
8. Slobodchikova, I.* & **Vuckovic, D.** Liquid chromatography – high-resolution mass spectrometry method for monitoring of 17 mycotoxins in human plasma for exposure studies, *J. Chromatogr. A* 1548, 51-63 (2018).
9. Reddy, C.N., Alhamza, H., Chourey, S., Ye, Q., Gore, V., Cossette, C., Gravel, S., Slobodchikova, I.*, **Vuckovic, D.**, Rokach, J., Powell, W., Metabolism and pharmacokinetics of a potent N-acylindole antagonist of the OXE receptor for the eosinophil chemoattractant 5-oxo-6,8,11,14-eicosatetraenoic acid (5-oxo-ETE) in rats and monkeys, *Eur. J. Pharm. Sci.* 115, 88-99 (2018).
10. Monnin, C*, Ramrup, P*, Daigle-Young, C* & **Vuckovic D.**, Improving negative ESI-LC-MS lipidomic analysis of human plasma using acetic acid as a mobile phase additive, *Rapid Commun. Mass Spectrom.* 32:201-211 (2018, **top 20 most-downloaded article of 2017-2018**).
11. J.A. Bowden, A. Heckert, C.Z. Ulmer, C.M. Jones, J.P. Koelmel, L. Abdullah, … **D. Vuckovic**, J.M. Weir, R. Welti, M.R. Wenk, C. Wheelock, M. Yuan, X. H. Zhao, & S. Zhou, Harmonizing Lipidomics: NIST Interlaboratory Comparison Exercise for Lipidomics using Standard Reference Material 1950 – Metabolites in Frozen Human Plasma, *J. Lipid Res.* 58, 2275-2288 (2017). (Note: authors are listed in alphabetical order except for those who designed the study.)
12. Chourey, S., Ye, Q., Reddy, C.N, Cossette, C., Gravel, S., Zeller, M., Slobodchikova, I.*, **Vuckovic, D.**, Rokach, J, & Powell, W.S.**,** In vivo α-hydroxylation of a 2-alkylindole antagonist of the OXE receptor for the eosinophil chemoattractant 5-oxo-6,8,11,14-eicosatetraenoic acid in monkeys, *Biochem. Pharm. 1*38, 107-118 (2017).
13. Sitnikov, D.*, Monnin, C.* & **Vuckovic D.,** Systematic Assessment of Seven Solvent and Solid-Phase Extraction Methods for Metabolomics Analysis of Human Plasma by LC-MS, *Sci. Rep.*6, 38885 (2016).
14. Cossette, C., Chourey, S., Ye, Q., Reddy, C.N., Gravel, S., Slobodchikova, I.*, **Vuckovic, D**., Rokach, J., & Powell, W.S., Pharmacokinetics and metabolism of selective OXE receptor antagonists and their effects on 5-oxo-ETE-induced granulocyte activation in monkeys *J. Med. Chem.* 59,10127-10146 (2016).
15. Li, P., Chevallier, P., Ramrup, P.*, Biswas, D., **Vuckovic, D.,** Fortin, M-A., Oh, J.K., Mussel-inspired multidentate block copolymer to stabilize ultrasmall superparamagnetic Fe_3O_4 for magnetic resonance imaging contrast enhancement and excellent colloidal stability, *Chem. Mater.* 27, 7100-7109 (2015).

16. Isserlin, R., Merico, D., Wang, D., **Vuckovic, D.**, Bousette N., Gramolini, A., Bader, G.D. & Emili, A. Systems analysis reveals down-regulation of a network of pro-survival miRNAs drives the apoptotic response in dilated cardiomyopathy. *Mol. BioSystems* 11, 239-251 (2015).
17. **Vuckovic, D.,** Dagley, L.F., Purcell, A.W., & Emili, A., Membrane proteomics by high performance liquid chromatography-tandem mass spectrometry: Analytical approaches and challenges. *Proteomics* 13, 404-423 (2013, **invited review**).
18. **Vuckovic, D.** High-throughput solid-phase microextraction in multi-well plate format. *TrAC Trend Anal. Chem.* 45, 136-153 (2013, **invited review**).
19. Bojko, B., **Vuckovic**, **D.**, Mirnaghi, F., Cudjoe, E., Wasowicz, M., Jerath, A. & Pawliszyn, J. Therapeutic monitoring of tranexamic acid concentration: high-throughput analysis with solid-phase microextraction *Ther. Drug Monit.* 34, 31-37 (2012).
20. Yeung, J., de Lannoy, I., Gien, B., **Vuckovic, D.**, Yang, Y., Bojko, B. & Pawliszyn, J., Semi-automated in vivo solid-phase microextraction sampling and the diffusion-based interface calibration model to determine the pharmacokinetics of methoxyfenoterol and fenoterol in rats *Anal. Chim. Acta* 742, 37-44 (2012).
21. Chan, J.N.Y., **Vuckovic, D.**, Sleno, L., Olsen, J., Pogoutse, O., Havugimana, P., Hewel, J.A., Bajaj, N., Wang, Y., Musteata, M.F., Nislow, C. & Emili, A., Target identification by chromatographic co-elution: monitoring of drug-protein interactions without immobilization or chemical derivatization (2012, JNYC and DV contributed equally, *Mol. Cell. Proteomics.* doi: 10.1074/mcp.M111.016642).
22. Tattoli, I., Sorbara, M.T., **Vuckovic, D.**, Ling, A., Soares, F., Carneiro, L.A.M., Yang, C., Emili, A., Philpott, D.J. & Girardin, S.E., Amino acid starvation induced by invasive bacterial pathogens triggers an innate host defense program. *Cell Host & Microbe* 11, 563-575 (2012, **Top 10 most read article August 2012**).
23. Bojko, B., **Vuckovic, D.** & Pawliszyn, J., Comparison of solid phase microextraction versus spectroscopic techniques for binding studies of carbamazepine. *J. Pharm. Biomed. Anal.* 66, 91-99 (2012).
24. **Vuckovic, D.** Current trends and challenges in sample preparation for global metabolomics using liquid chromatography – mass spectrometry. *Anal. Bioanal. Chem.* 403, 1523-1548 (2012, **invited review, Top 10 article of 2012**).
25. Bojko, B., Cudjoe, E., Gómez-Ríos, G.A., Gorynski, K., Jiang, R., Reyes-Garcés, N., Risticevic, S., Silva, E.A.S., Togunde, P., **Vuckovic, D.** & Pawliszyn, J., Solid-phase microextraction-Quo Vadis? *Anal. Chim. Acta,* **750**, 132-151 (2012, **invited review**).
26. **Vuckovic, D.,** de Lannoy, I., Gien B., Yang Y., Musteata, M.F. & Pawliszyn, J. *In vivo* solid-phase microextraction for single rodent pharmacokinetics studies of carbamazepine and carbamazepine-10,11-epoxide in mice. *J. Chromatogr. A* 1218, 3367-3375 (2011).
27. Ouyang, G., **Vuckovic, D.** & Pawliszyn, J. Nondestructive sampling of living systems using *in vivo* solid-phase microextraction. *Chem. Rev.* 111, 2784-2814 (2011, **invited review**).
28. **Vuckovic, D.** & Pawliszyn, J. Systematic evaluation of solid-phase microextraction coatings for untargeted metabolomic profiling of biological fluids by liquid chromatography-mass spectrometry. *Anal. Chem.* 83, 1944-1954 (2011).
29. Lord, H. L., Zhang, X., Musteata, F. M., **Vuckovic, D.**, & Pawliszyn, J. *In vivo* solid-phase microextraction: protocol for monitoring intravenous concentrations of drugs and metabolites in beagles. *Nat. Protoc.* 6, 896-924 (2011).
30. **Vuckovic, D.**, de Lannoy I., Gien, B., Shirey, B., Sidisky, L., Dutta, S. & Pawliszyn, J. *In vivo* solid-phase microextraction: capturing the elusive portion of metabolome. *Angew. Chem. Int. Ed.* 50, 5344-5348 (2011).
31. **Vuckovic, D.**, Risticevic, S. & Pawliszyn, J., Solid-phase microextraction in metabolomics: new opportunities for direct investigation of biological systems. *Angew. Chem. Int. Ed.* 50, 5618-5628 (2011, **invited mini-review**).
32. Bojko, B., **Vuckovic**, **D.**, Cudjoe, E., Hoque, E., Mirnaghi, F., Wasowicz, M., Jerath, A. & Pawliszyn, J. Determination of tranexamic acid concentration by solid phase microextraction and liquid chromatography-tandem mass spectrometry: first step to *in vivo* analysis. *J. Chromatogr. B* 879, 3781-3787 (2011).
33. **Vuckovic, D.**, Zhang, X., Cudjoe, E., & Pawliszyn, J. Solid-phase microextraction in bioanalysis: new devices and directions. *J. Chromatogr. A* 1217, 4041-4060 (2010, **invited review**).
34. **Vuckovic, D.**, Cudjoe, E., Musteata, F. M. & Pawliszyn, J. Automated solid-phase microextraction and thin-film microextraction for high-throughput bioanalytical applications and ligand-receptor binding studies. *Nat.*

Protoc. **5,** 140-161 (2010).

35. Yeung, J., **Vuckovic, D.** & Pawliszyn, J., Comparison and validation of calibration methods for in-vivo SPME determinations using an artificial vein system *Anal. Chim. Acta* 665, 160-166 (2010).

INVITED PRESENTATIONS SINCE 2017 (33 TOTAL; PRESENTER UNDERLINED, * TRAINEES)

1. A. Napylov*, A. Gupta*, S. Naz*, C. Monnin*, N. Reyes Garces, G. Gomez-Rios, M. Olkowicz, S. Lendor, B. Bojko, C. Hamani, J. Pawliszyn, **D. Vuckovic**, Improving lipid coverage and data quality for untargeted lipidomics and oxylipin profiling, 2019 ETP Tri-conference, Sherbrooke, Canada, August 2019
2. I. Slobodchikova*, C. Monnin*, S. Rahman*, R. Sivakumar*, **D. Vuckovic**, LC-HRMS for biomonitoring of mycotoxins in human plasma, 63rd International Conference on Analytical Sciences and Spectroscopy (63rd ICASS), Montréal, Canada, June 2019
3. A. Napylov*, N. Reyes Garces, M. Olkowicz, S. Lendor, E. Boyaci, G. Gomez-Rios, C. Monnin*, B. Bojko, C. Hamani, J. Pawliszyn, **D. Vuckovic**, Improving accuracy and selectivity of oxylipin analysis, 102nd Canadian Chemistry Conference and Exhibition (CSC), Québec City, Canada, June 2019
4. A. Napylov*, N. Reyes Garces, G. Gomez-Rios, C. Monnin*, M. Olkowicz, S. Lendor, B. Bojko, M. Diwan, C. Hamani, J. Pawliszyn, **D. Vuckovic**, (**invited workshop presentation**) In vivo SPME of eicosanoids in brain, 67th ASMS Conference on Mass Spectrometry and Allied Topics, Atlanta, Georgia, June 2019
5. **D. Vuckovic**, New advances in lipidomics for biomarker discovery and validation (**invited seminar**), Research Institute of the McGill University Health Centre (RI-MUHC), Montréal, Canada, April 23, 2019
6. **D. Vuckovic**, New approaches in LC-MS lipidomics, Department of Chemistry, University of Calgary, Calgary, Canada, March 2019
7. **D. Vuckovic,** M. De Sa Tavares Russo*, Improving accuracy of thiol measurements: Comparison of N-ethyl maleimide and N-(1-phenylethyl) maleimide derivatization in combination with liquid chromatography-mass spectrometry analysis, 10th Meeting of Canadian Oxidative Stress Consortium, Edmonton, Canada, June 2018
8. C. Monnin*, I. Slobodchikova*, P. Ramrup*, C. Daigle-Young*, **D. Vuckovic**, Influence of mobile phase additives on sensitivity in negative ESI: from mycotoxins to lipidomics, CSC, Edmonton, Canada, May 2018
9. **D. Vuckovic**, Increasing metabolite coverage and data quality in untargeted LC-MS metabolomics, Atlantic Basin Conference on Chemistry, Cancun, Mexico, January 2018
10. **D. Vuckovic**, Improving metabolite coverage in untargeted metabolomics (**invited seminar**), Department of Chemistry, Université de Montréal, Montréal, Canada, January 17, 2018
11. **D. Vuckovic**, Improving metabolite coverage in untargeted LC-MS metabolomics, Eastern Analytical Symposium, Plainsboro, NJ, US, November 2017
12. **D. Vuckovic**, Increasing sensitivity and selectivity for LC-MS bioanalysis: from mycotoxin biomonitoring to lipidomics (**invited seminar**), Departmental Seminar, Department of Chemistry, Carleton University, Ottawa, Canada, November 2017
13. **D. Vuckovic,** Multi-mycotoxin LC-MS methods: pushing the limits of sensitivity and selectivity in complex samples (**invited workshop**), Department of Food Science and Agricultural Chemistry, McGill University, Ste Anne De Bellevue, Canada, October 2017
14. D. Sitnikov*, C. Monnin*, **D. Vuckovic,** Improving Metabolite Coverage in LC-MS Untargeted Metabolomics of Human Plasma, CSC, Toronto, Canada, June 2017
15. **D. Vuckovic**, Scientific Frontiers in Clinical Metabolomics, MS-ESE Create Workshop (academic stream) (**invited oral + panel member**), Toronto, Canada, May 27, 2017
16. D. Sitnikov*, C. Monnin*, **D. Vuckovic**, Improving metabolite coverage in metabolomics: influence of sample preparation and mobile phase composition, Toronto Spring Mass Spectrometry Group Meeting, Toronto, Canada, May 2017
17. **D. Vuckovic**, Increasing Metabolite Coverage in Untargeted Metabolomic Profiling of Human Plasma, Pittcon Chicago, IL, US, March 2017

Other invited knowledge dissemination activities

Introduction to Metabolomics Course Instructor at Pittcon 2014 and Pittcon 2020
Solid-Phase Microextraction Course Lead Instructor at Pittcon 2009 and 2010

CURRENT FUNDING

- **NSERC Discovery Grant:** New analytical methods for global and targeted metabolomics (2019–2023, $145,000)
- **FRQNT Equipe Team Grant:** PI: S. Brar (INRS), Biomolécules actives d'intérêt pharmaceutique et alimentaire par fermentation de substrats agro-alimentaires**,** Co-applicants: A. Avalos-Ramirez (Centre National en Électrochimie et en Technologies Environnementales), D. Vuckovic (2018–2020, $200,000)
- **Heart and Stroke Foundation Grants in Aid Program**, PI: C. Gauthier (Physics, Concordia) Quantitative MRI of cerebral vascular, metabolic and microstructural health in cardiovascular disease (2017-2021, $214,500). Co-Applicants: A. Nigam (Montreal Heart Institute); L. Bherer (Université de Montréal); N. Stikov (Montreal Neurological Institute); D. Vuckovic
- **Concordia University Research Chair in Clinical Metabolomics, Biomarkers and Preventative Health (New Scholar)** (2016–2021, $100,000 research + salary stipend)
- **FRQS Chercheur Boursier Junior 1:** Méthodes métabolomiques et lipidomiques reposant sur la spectrométrie de masse pour une approche préventive et personnalisée de la santé (2016–2020, $306,321)

SELECTED PROFESSIONAL SERVICE TO ACADEMIC COMMUNITY (2012–2019)

Editorships and editorial board memberships

- Editor, *Sample Preparation*, 2012–2014
- Editorial Board Member, *Bioanalysis*, 2012–present
- Associate Editor – North America, *Journal of Integrated Omics*, 2012–present
- Guest editor of special issue in *Bioanalytical Techniques in Lipidomics* for *Bioanalysis* journal in March 2018

Peer review - journals

*Analytical Chemistry, Metabolomics, Scientific Reports, Analytica Chimica Acta (***Recognized as Outstanding Reviewer in 2015 (distinction given to top 10 percentile of reviewers),** *TrAC Trends in Analytical Chemistry (***Outstanding Reviewer in 2017***), Journals of Chromatography A and B*, *Journal of Separation Science*, *Bioanalysis*, *Analytical and Bioanalytical Chemistry*, *Metabolites*, *Analyst*, *Journal of Pharmaceutical and Biomedical Analysis*, *Talanta (***Outstanding Reviewer in 2017***), Nature Protocols, Journal of Mass Spectrometry...*

Symposium organization

- Co-organizer with Dr. Ann English (Concordia University) and Dr. Pierre Thibault (Université de Montréal) ACFAS symposium entitled *Métabolomique dans les sciences de la santé et de la vie:* May 12, 2014
- Organizer, *Frontiers in metabolomics: analytical challenges and advances* symposium at ACS Fall 2014 meeting, San Francisco, CA August 12, 2014
- Co-organizer with Dr. Karen Waldron (Université de Montréal), *Sample preparation* symposium at MSB 2016, Niagara-on-the-Lake, Canada, April 2–6, 2016
- Co-organizer with Dr. Jean-Francois Masson (Université de Montréal), *Human health and diagnostics* symposium at CSC 2016, Halifax, Canada, June 5–9, 2016
- Organizer, Metabolomics symposium at Pittcon 2017 conference in Chicago, entitled *Frontiers in Metabolomics: Analytical Challenges and Advances,* March 2017
- Co-organizer with Dr. Demian Ifa (York University), *General Analytical Chemistry* symposium at CSC 2017, Toronto, Canada, May 28–Jun 1, 2017
- Co-organizer with Dr. Paulina de La Mata (University of Alberta), *Metabolomics Applications and Techniques* symposium at CSC 2018, Edmonton, Canada, May 27–31, 2018 and CSC 2019, Quebec City, Canada, June 3-7, 2019
- Member of Scientific Organizing Committee, Metabolomics Association of North America (MANA) 2019 1st Annual Conference, Atlanta, GA, US, November 15-17, 2019

Oversight/advisory committees

- Committee Member of the Scientific Oversight Committee for Metabolomics Core Facility at Goodman Cancer Centre, McGill University, 2018 - present

Consortium memberships

- Member of the Metabolomics Quality Assurance and Quality Control Consortium (mQACC), sponsored by U.S. National Institutes of Health and National Cancer Institute, 2019 - present