Mensur Dlakic – Curriculum Vitae

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EDUCATION AND TRAINING

1987-1991	B.Sc. (Molecular Biology), Belgrade University, Belgrade
1993-1997	Ph.D. (Biochemistry), University of Nevada, Reno
1998-2003	Postdoc (Biochemistry & Bioinformatics), University of Michigan, Ann Arbor
2003	Postdoc (Genetics & Cell Biology), University of Edinburgh, Edinburgh

POSITIONS AND EMPLOYMENT

1991-1992	Research Fellow, Belgrade University, Belgrade
1993-1997	Graduate Research Assistant, Department of Biochemistry, University of Nevada, Reno
1998-1999	Postdoctoral Research Associate, HHMI, University of Michigan, Ann Arbor
2000-2003	Special Fellow of the Leukemia & Lymphoma Society, Department of Biological Chemistry,
	University of Michigan, Ann Arbor
2003	Senior Research Fellow, Institute of Cell and Molecular Biology, University of Edinburgh
2004-2010	Assistant Professor, Department of Microbiology, MSU, Bozeman
2011-present	Associate Professor, Department of Microbiology, MSU, Bozeman
2005-present	Member, Thermal Biology Institute, MSU, Bozeman
2006-present	Faculty, Molecular Biosciences Program, MSU, Bozeman
2007-2013	Faculty, IGERT, MSU, Bozeman
2008-2013	Advisory Board Member, IGERT, MSU, Bozeman
2009-2013	Advisory Board Member, Molecular Biosciences Program, MSU, Bozeman

ACADEMIC HONORS

1994-1998	Supplementary Grant from the Open Society Institute, New York
1995	Graduate Student Association Award for Excellence in Scientific Writing
1996	Graduate Student Association Award for Academic Achievement in Biomedical Sciences
1999	Postdoctoral Fellowship, University of Michigan. Sponsored by Rackham Interdisciplinary
	Institute
1999-2000	Postdoctoral Fellowship, University of Michigan. Sponsored by AACR-Sydney Kimmel
	Foundation for Cancer Research
2000-2003	Special Fellowship, University of Michigan. Sponsored by Leukemia & Lymphoma Society

SCIENTIFIC ACTIVITIES

1997- Reviewer for Biochemistry, Bioinformatics, Biophysical Journal, BMC Bioinformatics, BMC Structural Biology, FEBS Journal, Frontiers Journals, Genome Research, Journal of Biological Chemistry, Journal of Molecular Biology, Microbial Pathogenesis, Nucleic Acids Research, PNAS, Proteins, Protein Science, RNA

2006-	Ad Hoc NIH Reviewer
2007-	Ad Hoc NSF Reviewer
2009	Mail reviewer for NIH Recovery Act Grants
2021-	Ad Hoc Medical Research Council Reviewer (UK)
2011-	Frontiers in Genetics, section Computational Biology, Associate Editor
2013-	Biology Direct, Editorial Board (Structural and Molecular Biology)
2014-2015	Frontiers in Cellular & Infection Microbiology, Guest Associate Editor
2020-	Frontiers in Bioinformatics, section Protein Bioinformatics, Associate Editor

MOST RECENT PEER-REVIEWED PUBLICATIONS (LAST ~10 YEARS, A TOTAL OF 52):

- 37. Gress, JC, Robertson HM, Weaver DK, <u>Dlakic M</u>, Wanner KW (2013) Odorant Receptors of a Primitive Hymenopteran Pest, the Wheat Stem Sawfly. *Insect Mol. Biol.* 22: 659-667.
- Shenker BJ, Walker LP, Zekavat A, <u>Dlakic M</u>, Boesze-Battaglia K (2014) Blockade of the PI-3K signaling pathway by the Aggregatibacter actinomycetemcomitans cytolethal distending toxin induces macrophages to synthesize and secrete pro-inflammatory cytokines. *Cell Microbiol.* 16: 1391-1404.
- Boesze-Battaglia K, Walker LP, Zekavat A, <u>Dlakic M</u>, Scuron MD, Nygren P, Shenker BJ (2015) The Aggregatibacter actinomycetemcomitans Cytolethal Distending Toxin Active Subunit CdtB Contains a Cholesterol Recognition Sequence Required for Toxin Binding and Subunit Internalization. Infect. Immun. 83: 4042-4055.
- 40. Kleven MD, <u>Dlakic M</u>, Lawrence CM (2015) Characterization of a Single b-type Heme, FAD, and Metal Binding Sites in the Transmembrane Domain of Six-transmembrane Epithelial Antigen of the Prostate (STEAP) Family Proteins. *J. Biol. Chem.* 290: 22558-22569.
- Boesze-Battaglia K, Walker LP, Zekavat A, <u>Dlakic M</u>, Scuron MD, Nygren P, Shenker BJ (2015) The Aggregatibacter actinomycetemcomitans Cytolethal Distending Toxin Active Subunit CdtB Contains a Cholesterol Recognition Sequence Required for Toxin Binding and Subunit Internalization. *Infect. Immun.* 83: 4042-55.
- 42. Shenker BJ, Boesze-Battaglia K, Scuron MD, Walker LP, Zekavat A, <u>Dlakic M</u> (2016) The toxicity of the Aggregatibacter actinomycetemcomitans cytolethal distending toxin correlates with its phosphatidylinositol-3,4,5-triphosphate phosphatase activity. *Cell Microbiol.* 18: 223-43.
- 43. Boesze-Battaglia K, Alexander D, <u>Dlakic M</u>, Shenker BJ (2016) A Journey of Cytolethal Distending Toxins through Cell Membranes. *Front. Cell Infect. Microbiol.* 6: 81.
- 44. Scuron MD, Boesze-Battaglia K, <u>Dlakic M</u>, Shenker BJ (2017) The Cytolethal Distending Toxin Contributes to Microbial Virulence and Disease Pathogenesis by Acting As a Tri-Perditious Toxin. *Front. Cell Infect. Microbiol.* 6: 168.
- Jay ZJ, Beam JP, <u>Dlakic M</u>, Rusch DB, Kozubal MA, Inskeep WP (2018) *Marsarchaeota* are an aerobic archaeal lineage abundant in geothermal iron oxide microbial mats. *Nature Microbiol.* 3: 732-740.
- McKay LJ, <u>Dlakic M</u>, Fields MW, Delmont TO, Eren AM, Beam JP, Klingelsmith KB, Rusch DB, Inskeep WP (2019) Co-occurring genomic capacity for anaerobic methane and dissimilatory sulfur metabolisms discovered in the *Korarchaeota*. *Nature Microbiol*. 4: 614-622.
- 47. Mushegian A, Sorokina I, Eroshkin A, <u>Dlakic M</u>, (2020) An Ancient Evolutionary Connection Between Ribonuclease A and EndoU Families. *RNA* 7: 803-813.

- 48. Altae-Tran, H, Kannan, S, Demircioglu, FE, Oshiro, R, Nety, SP, McKay, LJ, <u>Dlakic, M</u>, Inskeep, WP, Makarova, KS, Macrae, RK, Koonin, EV and Zhang, F (2021) The widespread IS200/IS605 transposon family encodes diverse programmable RNA-guided endonucleases. *Science* 374: 57-65.
- McKay, LJ, Nigro, OD, <u>Dlakic, M</u>, Luttrell, KM, Rusch, DB, Fields, MW and Inskeep, WP (2022) Sulfur cycling and host-virus interactions in Aquificales-dominated biofilms from Yellowstone's hottest ecosystems. *ISME J.* 16: 842-855.
- Williamson, KS, <u>Dlakic, M</u>, Akiyama, T, Franklin, MJ (2023) The Pseudomonas aeruginosa RpoH (σ³²) Regulon and Its Role in Essential Cellular Functions, Starvation Survival, and Antibiotic Tolerance. *Int. J. Mol. Sci.* 12: 1513.
- 51. Meslé, MM, Gray, CR, <u>Dlakic, M</u>, DuBois, JL (2023) *Bacteroides thetaiotaomicron*, a Model Gastrointestinal Tract Species, Prefers Heme as an Iron Source, Yields Protoporphyrin IX as a Product, and Acts as a Heme Reservoir. *Microbiol Spectr.* 11: 4815-22.
- 52. <u>Dlakic, M</u> (2023) Discovering unknown associations between prokaryotic receptors and their ligands. *Proc. Natl Acad. Sci. USA*, **In press**.

BOOK CHAPTERS, REVIEWS AND INVITED PUBLICATIONS

- Harvey SC, <u>Dlakic M</u>, Griffith J, Harrington RE, Park K., Sprous D, Zacharias W (1996) What is The Basis of Sequence-Directed Curvature in DNAs Containing A Tracts? *In* Biological Structure and Dynamics Vol. 2 (Sarma, R. H. & Sarma, M. H., Eds., Adenine Press), 295-302.
- <u>Dlakic M</u>, Han W, Lindsay SM, Harrington RE (1998) DNA Kinking as Imaged with a New High-Resolution AFM. *In* Structure, Motion, Interaction and Expression of Biological Macromolecules (Sarma, R. H. & Sarma, M. H., Eds., Adenine Press), 167-175.
- 3. Dlakic M, Kerppola TK (2001) DNA structure changes coupled to protein binding. *In Encyclopedia of Life Sciences*, A0003009 (Macmillan Publishers Ltd; <u>http://www.els.net</u>).
- 4. <u>Dlakic M</u>, Ussery DW, Brunak S. (2005) DNA bendability and nucleosomal positioning in transcriptional regulation. *In* DNA conformation and transcription (Ohyama, T. Ed., Landes Biosciences), 189-202.
- 5. <u>Dlakic M</u> (2005) The ribosomal subunit assembly line. *Genome Biol.* 6: 234-238.

Please click <u>here</u> for a complete list of publications.

Current grant support:

NSF-1950770Inskeep (PI)\$286,030.0005/01/20 - 04/30/24OPUS: Integration of Phylogenomic and Metabolic Analyses to Understand the Biodiversity of Deeply Rooted
Microbial LineagesThis proposal will synthesize, explore and illuminate numerous functional attributes in microorganisms that

have been directly influenced by environmental forces.

Role: co-PI (PI Bill Inskeep)

NIH- R21AI154171Franklin (PI)\$396,000.0004/01/21 - 03/31/24Role of Ribosome Hibernation in the Tolerance of P. aeruginosa Biofilms to AntibioticsIn this proposal we will use the fluerescent reporter systems to identify and sort active from dormant bacteria

In this proposal we will use the fluorescent reporter systems to identify and sort active from dormant bacteria over the course of biofilm development, and identify additional dormancy factors that contribute to the antibiotic tolerance.

Role: co-PI (PI Michael Franklin)

TEACHING

BIOL 102 Molecular & Cellular Biology, Fall 2005-09
BIOB 160 Principles of Living Systems, Fall 2010-12; Spring 2014; Fall 2014-2023
MB 400 Undergraduate Seminar, Spring 2006; Fall 2009
BIOM 455 Research Methods in Microbiology, Spring 2005-09; Spring 2011, 2013, 2015, 2019
BIOM 494 Undergraduate Seminar, Fall 2010, Spring-Fall 2011, 2012, 2018-23; Fall 2013-2017
MB 500 Graduate Seminar, Fall 2004
MB 544 Advanced Bioinformatics, Spring 2008-12, Spring 2014, 2016, 2018, 2020-2023
BIOM 491 Trends in Microbiology, Spring 2013-15 (delivered fully online)

Guest Lecturer:

MB 110CS Introduction to Biotechnology, Fall 2008-11 DGED 610 Geobiological Systems Science, Fall 2008-11

MENTORING AND ADVISING

Graduate Students:

Anupam Goel, 2005-2006, graduated from Chemistry at MSU Joella Geary, 2006-2008, graduated Cathy Castle, 2006-2008, graduated Tatsuya Akiyama, 2013, graduated Tyson Vervoort, 2013, graduated from Chemistry at MSU Jacob Robison, 2014-2015, graduated from Chemistry at MSU Russell Spaan, 2017, MS student at MSU

Undergraduate Students: Kaitlin Basham, 2007-2009, PhD U of Utah Kristen Olerup, 2011, graduated Erika Lacy, 2011-2012, MS at MSU Katrina Jackson, 2012-2013, now at NIH Andrew Burchak, 2013, graduated Eaon Hanebury, 2014, graduated Britney Gibbs, 2015-2016, graduated Murat Buyukyoruk, 2015-2016, now PhD student at MSU Taylor Herzog, 2017-2018, graduated Claire Zuetell, 2020-2022, graduated, now MS student at MSU Katrina Rowland, 2022-2022, sophomore at MSU Heidi Hansch, 2023-, junior at MSU

TRAINING

- DNA, RNA, and protein isolation; PCR, RT-PCR; DNA sequencing and synthesis of standard and modified oligos; Southern, Northern and Western blotting
- Subcloning of natural and synthetic DNA fragments (cloned >100 genes from various species)
- In vitro and in vivo protein expression and purification; Site-directed mutagenesis
- In vitro assays of DNA-protein binding; DNA and RNA binding site selection in vitro (SELEX)
- Analysis of protein-DNA interactions using fluorescence resonance energy transfer (FRET)

- Enzymatic and chemical methods of DNA cleavage (DNase I, hydroxyl-radicals, dimethyl sulphate, potassium permanganate); Footprinting protein-DNA complexes
- Protein-mediated DNA circularization and phasing analysis studies of protein-induced DNA bending
- Mammalian cell culture; Fluorescent imaging of proteins and protein complexes; BiFC
- rRNA processing; Yeast genetics
- Imaging of DNA and protein-DNA complexes with Scanning Tunnel and Atomic Force Microscopes
- Large-scale protein and DNA production and purification; Crystallization trials
- Probabilistic models (Hidden Markov Models) of protein families; Automatic machine learning techniques; Secondary structure prediction of proteins
- Iterative profile searches, fold recognition and comparative modeling of proteins
- Genomic search for protein binding sites; Comparative genomics at the level of DNA and proteins
- Computer modeling of DNA structure and macromolecular graphics
- Background in all aspects of computer applications; Administrator for small Unix and Linux systems