

Michael J. Federle, Ph.D.

University of Illinois at Chicago
Center for Pharmaceutical Biotechnology
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EDUCATION

Ph.D., Microbiology and Molecular Genetics September, 1997 – March, 2002
Emory University, Atlanta, GA
Thesis: Uncovering the *Streptococcus pyogenes* CovRS global regulator of virulence: describing a regulon and an unusual mechanism for repression.
Advisor: June R. Scott, Ph.D.

B.S., Genetics September, 1990 – May, 1994
University of Wisconsin-Madison

RESEARCH EXPERIENCE

Assistant Professor May, 2008 - Present
University of Illinois at Chicago
Center for Pharmaceutical Biotechnology
Dept. of Medicinal Chemistry and Pharmacognosy
College of Pharmacy

Postdoctoral Research Fellow and Research Associate May, 2002 – May, 2008
Princeton University/Howard Hughes Medical Institute
Department of Molecular Biology
Advisor: Bonnie Bassler, Ph.D.

Research Specialist II May, 1995 – Sept., 1997
Emory University, Atlanta, GA
Department of Microbiology and Immunology
Supervisor: June R. Scott, Ph.D.

Associate Research Specialist May, 1994 – May, 1995
University of Wisconsin-Madison
Department of Genetics
Supervisor: Frederick Blattner, Ph.D.

PUBLICATIONS

- Chang, J.C., B. LaSarre, J.C. Jimenez, C. Aggarwal, and **M.J. Federle**. Two Group A Streptococcal Peptide Pheromones Act Through Opposing Rgg Regulators to Control Biofilm Development. *PLoS Pathog.* 7(8): e1002190. doi:10.1371/journal.ppat.1002190.
- LaSarre, B. and **M.J. Federle**. 2011. Regulation and Consequence of Serine Catabolism in *Streptococcus pyogenes*. *Journal of Bacteriology*. 193(8): 2002-2012.
- Mashburn-Warren, L., D.A. Morrison, and **M.J. Federle**. 2010. A novel double-tryptophan peptide pheromone controls competence in *Streptococcus* spp. via an Rgg regulator. *Mol Microbiol*, 78(3):589-606. PMID: 20969646. **This article was featured in a MicroCommentary in same issue.**

- **Federle, Michael J.** 2009. Autoinducer-2 Based Chemical Communication in Bacteria: Complexities of Interspecies Signaling. In ***Bacterial Sensing and Signaling***, Editors Raymond Schuch and Mattias Collin. Karger Publishing. 16:18-32.
- Neiditch*, M.B., **M.J. Federle***, A.J. Pompeani, R.C. Kelly, D.L. Swem, P.D. Jeffrey, B.L. Bassler, and F.M. Hughson. 2006. Autoinducer-2-induced asymmetry regulates LuxPQ quorum Sensing signal transduction. ***Cell***. 126(6):1095-108. *Authors contributed equally to work.
- Neiditch, M.B., **M.J. Federle**, S.T. Miller, B.L. Bassler, F.M. Hughson. 2005. Regulation of LuxPQ receptor activity by the quorum sensing signal autoinducer-2. ***Molecular Cell***. 18(5):507-18.
- Semmelhack, M.F., S.R. Campagna, **M.J. Federle**, and B.L. Bassler. 2005. An Expeditious Synthesis of DPD and Boron Binding Studies. ***Organic Letters***. 7(4):569-72.
- Semmelhack, M.F., S.R. Campagna, C. Hwa, **M.J. Federle**, and B.L. Bassler. 2004. Boron binding with the quorum sensing signal AI-2 and analogues. ***Organic Letters***. 6(15):2635-7.
- **Federle, M.J.** and B.L. Bassler. 2003. Interspecies communication in bacteria. ***Journal of Clinical Investigation***. 112(9):1291-1299.
- **Federle, M. J.** and J.R. Scott. 2002. Identification of binding sites for the group A streptococcal global regulator CovR. ***Molecular Microbiology***. 43(5), 1161-72.
- Graham, M.R., L.M. Smoot, C.A. Migliaccio, K. Virtaneva, D.E. Sturdevant, S.T. Porcella, **M. J. Federle**, G.J. Adams, J.R. Scott, and J.M. Musser. 2002. Virulence control in group A Streptococcus by a two-component gene regulatory system: global expression profiling and in vivo infection modeling. ***Proc. Natl. Acad. Sci. USA***. 99(21):13855-13860.
- Benfang, L., F.R. Deleo, N.P. Hoe, M.R. Graham, S.M. Mackie, R.L. Cole, M. Liu, H.R. Hill, D. E. Low, **M. J. Federle**, J.R. Scott, and J.M. Musser. 2001. Evasion of human innate and acquired immunity by a bacterial homologue of CD11b that inhibits opsonophagocytosis. ***Nature Medicine***. 7(12):1298-1305.
- **Federle, M.J.**, K.S. McIver, and J.R. Scott. 1999. A response regulator that represses the transcription of several virulence operons in the group A *Streptococcus*. ***Journal of Bacteriology***. 181:3649-3657.
- Eichenbaum, Z., **M.J. Federle**, D. Marra, W.M. DeVos, O.P. Kuipers, M. Kleerebezem, and J. R. Scott. 1998. Use of the lactococcal *nisA* promoter to regulate gene expression in gram-positive bacteria: comparison of induction level and promoter strength. ***Applied and Environmental Microbiology***. 64: 2763-2769.

FUNDING AND AWARDS

"Mechanistic Dissection of Pheromone-Dependent Regulation of Group A Streptococcal Virulence" **NIH R01 AI091779** (PI).

"AI-2-Dependent Quorum Sensing in the Gram-Positive Bacterium *Streptococcus pyogenes*" **NIH Pathway to Independence (PI) Award (K99/R00). K99 GM080539, R00 GM080539**

"Peptide Quorum Sensing in the Gram-Positive Bacterium *Streptococcus pyogenes*" **UIC College of Pharmacy Hans Vahlteich Award**. Sept. 16, 2008-Sept. 15, 2009.

Ruth L. Kirschstein National Research Service Awards (NRSA). Grant #5F32GM068371

AI-2 Mediated Quorum Sensing in *Vibrio harveyi*.
April, 2003 – March, 2006

NIH Training Grant on Molecular Mechanisms of Bacterial Pathogenesis
Sept., 1999 – May, 2002

Northland Orthopedic Merit Scholarship
Sept., 1990 – May, 1994

PATENTS

Expeditious Synthesis of DPD. United States Patent #7652172

PRESENTATIONS

- Platform Speaker, Molecular Genetics of Bacteria and Phages, Madison, WI. Aug 2-7, 2011.
- Platform Speaker, 6th International Conference on Gram-positive Microorganisms, Montecatini Terme, Italy. June 21, 2011
- Platform Speaker, American Society of Microbiology General Meeting, New Orleans. Session: Bacterial Sensors and Sensing Mechanisms. May 22, 2011
- Invited Speaker, University of Indiana, School of Medicine-Northwest. Host Taeok Bae. April 8, 2011
- Invited speaker, University of Illinois, College of Medicine at Rockford, Dept. of Biomedical Sciences. Host Ramaswamy Kalyanasundaram. March 14, 2011
- Invited speaker, Loyola University, Dept. of Microbiology and Immunology. Host Edward Campbell. March 3, 2011
- Invited speaker, University of Illinois-Urbana-Champaign, Dept. of Microbiology. Host James Slaugh. Feb. 17, 2011
- Poster Presentation. International Conference for Gram-Positive Pathogens. Omaha, NE. Oct. 10-13, 2010.
- Invited Speaker, University of Michigan, Dept. of Molecular, Cellular, & Developmental Biology, Host Blaise Bowles. September 17, 2010
- Invited Speaker, Neurogastroenterology and Motility Joint International Meeting, Boston, MA. August 28, 2010
- Platform Speaker, Wind River Conference on Prokaryotic Biology, Estes Park, CO. June 2-5, 2010
- Invited speaker, University of Iowa, Dept. of Microbiology and Immunology. Host Alexander Horswill
- Invited speaker, Illinois State University, Dept. of Biological Sciences. Host Wade Nichols
- Invited speaker, Northwestern University, Dept. of Microbiology and Molecular Genetics; Host Hank Seifert.
- Invited speaker, 16th Annual Midwest Microbial Pathogenesis Conference. Purdue University. Oct. 9-11, 2009
- Invited speaker, Michigan State University, Dept. of Microbiology and Molecular Genetics. Host Christopher Waters. Sept. 8, 2009
- Invited speaker, Frontiers of GI Research Conference, University of Illinois at Chicago. Host Gail Hecht. April 22, 2009
- Invited speaker, Rush University Medical Center, Dept. of Microbiology and Immunology. Host Greg Spear. March 20, 2009
- Invited speaker, University of Illinois at Chicago, Dept. of Biopharmaceutical Sciences. Host Seungpyo Hong. March 4, 2009
- Invited speaker, North Central College, Naperville, IL. Host Jeffrey Jankowski. February 16, 2009
- Invited speaker, University of Chicago, Dept. of Surgery. Host John Alverdy. February 10, 2009
- Invited speaker, Joint Metastasis Research Society-AACR Conference on Metastasis, Vancouver, Canada. New Paradigms Session. Host Carrie Rinker-Schaefer. August 3-7, 2008
- Poster, ASM Conference on Cell-Cell Communication in Bacteria. October, 2008.

- Poster, Gordon Conference on Microbial Adhesion and Signal Transduction. July 2007
- Speaker, National Conference of Gram-Positive Pathogens. Omaha, NE. October, 2006.
- Invited speaker. Microbe Project Interagency Working Group's (WPIWG) Microbial Communications Workshop. Washington, DC. September 15, 2006.
- Poster, ASM Conference on Cell-Cell Communication in Bacteria. July, 2004.
- Poster, 6th Annual ASM Streptococcal Genetics Meeting. April, 2002.
- Poster, Cold Spring Harbor Laboratory Meeting: Microbial Pathogenesis and Host Response. October, 2001.
- Poster, FASEB Conference, Microbial Pathogenesis: Mechanisms of Infectious Disease. August, 2000.
- Poster, Cold Spring Harbor Laboratory Meeting: Microbial Pathogenesis and Host Response. September, 1999.

TEACHING EXPERIENCE

Lectures

MIM322 Medical Microbiology. UIC College of Dentistry.

MIM425 Medical Microbiology. UIC College of Medicine.

MIM560 Advanced Topics in Microbiology. UIC Dept. of Microbiology and Immunology.

MIM594 Grant Writing. UIC Dept. of Microbiology and Immunology.

PMPR355 Seminar in Pharmacy Research. UIC Dept. of Pharmacy Practice.

PMPG511 Advanced Pharmacognosy. UIC Dept. of Medicinal Chemistry and Pharmacognosy.

GCLS 502 Molecular Biology.

PMMP 412/MDCH 412 Pharmaceutical Applications of Genomics and Bioinformatics.

PHAR333: Mechanisms of Drug Action I

PHAR408: Mechanisms of Drug Action III

Service

Ad Hoc Reviewer for

- *Journal of Bacteriology*
- *Molecular Microbiology*
- *Infection and Immunity*
- *FEMS Microbiology Reviews*
- *Chemical Reviews*
- *Virulence*
- *Antonie van Leeuwenhoek*
- *Environmental Microbiology/Environmental Microbiology Reviews*
- *Microbiology*
- *PLoS Pathogens*