

Monica Chander, Ph.D.

Associate Professor

**Department of Biology
Bryn Mawr College**

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EDUCATION **Ph.D. University of Connecticut, Farmington, CT 2000**
Biomedical Sciences with a concentration in Molecular Biology and
Biochemistry
B.A. Mount Holyoke College, South Hadley, MA 1993
Cum laude with high honors in Biochemistry

PROFESSIONAL EXPERIENCE **Associate Professor** (September 2013 – present)
Bryn Mawr College, Department of Biology, Bryn Mawr, PA.

Department Chair (June 2015 – December 2018)
Bryn Mawr College, Department of Biology, Bryn Mawr, PA.

Assistant Professor (July 2007 – August 2013)
Bryn Mawr College, Department of Biology, Bryn Mawr, PA.

Visiting Assistant Professor (January – May 2006)
Mount Holyoke College, Program in Biochemistry, S. Hadley, MA.

Research Associate (Sept. 2004 – Dec. 2005; June 2006 – June 2007)
Mount Holyoke College, Program in Biochemistry, S. Hadley, MA.
Advisor: Dr. Lilian Hsu
Research focus: Mechanism of abortive initiation and promoter escape by
Escherichia coli RNA Polymerase.

Research Fellow (September 2000-August 2004)
Harvard School of Public Health, Department of Genetics and Complex
Diseases, Boston, MA.
Advisor: Dr. Bruce Dimple
Research focus: Oxidative stress response in *Escherichia coli*: molecular
details underlying the regulation and mechanism of action of the redox-active
[2Fe-2S]-containing SoxR transcription factor.

Postdoctoral Fellow (February – July 2000).
University of Connecticut Health Center, Department of Biochemistry,
Farmington, CT.
Advisor: Dr. Peter Setlow
Research focus: Regulation of dormancy and heat resistance in *Bacillus
subtilis* spores.

Graduate Student (August 1993-February 2000)

University of Connecticut Health Center, Department of Biochemistry,
Farmington, CT.

Advisor: Dr. Peter Setlow

Thesis: Regulation of *Bacillus stearothermophilus* phosphoglycerate mutase
by pH and Mn²⁺.

Undergraduate Research (September 1992 – May 1993)

Mount Holyoke College, Department of Biology, South Hadley, MA.

Advisor: Dr. Marilyn Pryor

Thesis: The effect of thyroid blocks on beta-adrenergic receptor levels in
brown adipose tissue (BAT) of cold-exposed *Mus musculus*.

Chemistry intern (Summer 1992)

Mount Holyoke College, Department of Chemistry, South Hadley, MA.

Advisor: Dr. Mary Campbell

Developed new experiments for general and inorganic college laboratory
classes.

GRANTS
HONORS
AWARDS

National Institutes of Health AREA grant 2R15GM093366-02A1

September 2014 – May 2019; \$285,500

Project title: Adaptation of *Streptomyces coelicolor* to endogenous antibiotics
mediated by a redox-sensing transcription factor.

Faculty Research Fund, Bryn Mawr College Mar. 2014-Aug. 2015; \$4000

National Institutes of Health AREA grant 1R15GM093366-01

April 2010 – August 2013; \$202,767

Project title: Regulation of *Streptomyces* differentiation and antibiotic
production by SoxR

Edward G. Henderson Memorial Prize (2000)

Outstanding Ph.D. thesis research in Biomedical Sciences

University of Connecticut Health Center

Cum Laude with High Honors in Biochemistry (1993)

Mount Holyoke College

Louisa Stevenson Prize (1992)

Excellence in Chemistry, Mount Holyoke College

Sarah Williston Scholar (1991)

Top 15 percent of class, Mount Holyoke College

Bernice MacLean Award (1990)

Excellence in Biology, Mount Holyoke College

PUBLICATIONS * indicates undergraduate co-author; # indicates corresponding author

Chander, M, Lee, A.* , Vallery, T.* , Thandar, M.* , Jiang, Y.* , Hsu, L.# **2015**. Mechanisms of very long abortive transcript (VLAT) release during promoter escape. *Biochemistry* 54(50): 7393-408.

Naseer, N*, Shapiro, Joshua A., **Chander, M#**. **2014**. RNA-Seq analysis reveals a six-gene SoxR regulon in *Streptomyces coelicolor*. *PLOS One* 9(8):e106181.

Sheplock, R.* , Recinos, D.A., Mackow, N.* , Dietrich, L.E.P.# , and **Chander, M#**. **2013**. Species-specific residues calibrate SoxR sensitivity to redox-active molecules. *Mol. Microbiol.* 87: 368-381.

Dela Cruz, R.* , Gao, Y.* , Penumetcha, S.* , Sheplock, R.* , Weng, K.* , and **Chander, M#**. **2010**. Expression of the *Streptomyces coelicolor* SoxR regulon is intimately linked with actinorhodin production. *J. Bacteriol.* 192: 6428-6438.

Chander, M., Austin, K. M.* , Aye-Han, N.-N.* , Sircar, P.* , and Hsu, L. M# . **2007**. An alternate mechanism of abortive release marked by the formation of very long abortive transcripts. *Biochemistry* 46: 12687-12699.

Chander, M., and Demple, B# . **2004**. Functional analysis of SoxR residues affecting transduction of oxidative stress signals into gene expression. *J. Biol. Chem.* 279: 41603-10.

Chander, M., Raducha-Grace*, L., and Demple, B# . **2003**. Transcription-defective *soxR* mutants of *Escherichia coli*: Isolation and *in vivo* characterization. *J. Bacteriol.* 185: 2441-50.

Tovar-Rojo, F., **Chander, M.**, Setlow, B., and Setlow, P# . **2002**. The products of the *spoVA* operon are involved in dipicolinic acid uptake into developing spores of *Bacillus subtilis*. *J. Bacteriol.* 184: 584-7.

Jedrzejewski, M.J.# , **Chander, M.**, Setlow, P., and Krishnasamy, G. **2000**. Mechanism of catalysis of the cofactor independent phosphoglycerate mutase from *Bacillus stearothermophilus*: crystal structure of the complex with 2-phosphoglycerate. *J. Biol. Chem.* 275: 23146-53.

Jedrzejewski, M.J.# , **Chander, M.**, Setlow, P., and Krishnasamy, G. **2000**. Structure and mechanism of action of a novel phosphoglycerate mutase from *Bacillus stearothermophilus*. *EMBO J.* 19: 1419-31.

Chander, M., Setlow, P., Lamani, E., and Jedrzejewski, M.J# . **1999**. Structural studies on a 2,3-diphosphoglycerate independent phosphoglycerate mutase from *Bacillus stearothermophilus*. *J. Struct. Biol.* 126: 156-65.

Chander, M., Setlow, B., and Setlow, P[#]. **1998**. The enzymatic activity of phosphoglycerate mutase from gram-positive endospore-forming bacteria requires Mn²⁺ and is pH sensitive. *Can. J. Microbiol.* 44: 759-67.

Loshon, C.A., Beary, K.E.*, **Chander, M.**, and Setlow, P[#]. **1994**. Cloning and sequencing of the *sspF* (originally 0.3 kb) genes from *Bacillus cereus* and *Bacillus megaterium*. *Gene*.150: 203-4.

ABSTRACTS
POSTERS
& INVITED
LECTURES

* indicates undergraduate co-author

Chander, M., Huang, A.*, Bae, K.*, and Sharma, M.* (2019) Abstract and poster

Does SoxR play solely a protective role in *Streptomyces coelicolor*?
20th International Conference on Bacilli and Gram-Positive Bacteria,
Washington D.C.

Chander, M. (2018) Invited talk

Potential role of the redox-sensor SoxR in protecting *Streptomyces coelicolor*
from endogenously-produced antibiotics
Department of Microbiology, University of Pennsylvania, PA

Chander, M. (2015) Invited talk

Potential role of the redox-sensor SoxR in protecting *Streptomyces coelicolor*
from endogenously-produced antibiotics
Department of Chemistry and Biochemistry, University of Delaware, DE

Chander, M. (2013) Invited talk

Multiple functions for SoxR: alerting the cell to oxidative stress and more
Biology Department, Saint Joseph's University, PA

Chander, M. (2010) Invited talk

Redox sensing by SoxR: alerting the cell to oxidative stress (and more?)
Biology Department, Hofstra University, NY

Chander, M., Dela Cruz, R.*, Gao, Y.*, and Penumetcha, S.* (2010) Abstract and poster

Expression of the *Streptomyces coelicolor* SoxR regulon parallels
actinorhodin production
Gordon Research Conference on Microbial Stress Responses, S. Hadley, MA

Chander, M. (2009) Invited talk

Redox sensing by SoxR: alerting the cell to oxidative stress (and more?)
Chemistry Department, Bryn Mawr College, PA

Chander, M., Dela Cruz, R*., Gao, Y.*, Penumetcha, S.*, and Weng, K*.
(2009) Abstract and poster

Analyzing the role of SoxR in *Streptomyces coelicolor*
American Society for Microbiology, General Meeting, Philadelphia, PA

Chander, M. and Hsu, L.M. (2006) Abstract and poster
Deducing the mechanisms of formation of very long abortive transcripts
during transcription initiation
Molecular Genetics of Bacteria and Phages, Cold Spring Harbor, NY

Chander, M. and Hsu, L.M. (2005) Abstract and poster
Probing the origin of very long abortive transcripts (16-19 nucleotides) during
transcription initiation
FASEB Summer Research Conferences, Saxton Rivers, VT

Chander, M. and Demple, B. (2004) Abstract and poster
Functional analysis of SoxR residues affecting transduction of oxidative stress
signals into gene expression
Gordon Research Conference on Microbial Stress Responses, S. Hadley, MA

Chander, M., Murray, C., and Demple, B. (2003) Abstract and poster
Probing the signal transduction mechanism of SoxR
Boston Bacterial Meeting, Boston, MA

Chander, M. and Demple, B. (2003) Abstract and lecture
Probing the redox signal transduction mechanism of SoxR
Wind River Conference on Prokaryotic Biology, Estes Park, CO

Chander, M. and Setlow, P. (1997) Abstract and lecture
Regulation of phosphoglycerate mutase activity from endospore-forming
bacteria by Mn^{2+} and pH
New England Spore Conference, Cambridge, MA

Chander, M. and Setlow, P. (1996) Abstract and poster
Characterization of the DPG-independent phosphoglycerate mutase from
Bacillus subtilis
Biotechnology Symposium, Storrs, CT

EXTRAMURAL
PROFESSIONAL
ACTIVITIES

Ad-hoc scientific reviewer for peer-reviewed journals:

- *Archives of Microbiology*
- *Cellular and Molecular Biochemistry*
- *Molecular Microbiology*
- *Plos Genetics*
- *Scientific Reports*

July 2023: Attended 16th Annual Regional Microbiology Educators Student
Research Symposium, Saint Joseph's University

June 2023: Attended New York *Bacillus* Interest Group Annual Meeting, New
York University, NY

June 2023: Attended Gordon Research Conference on Bacterial Cell Biology
and Development, Manchester, NH

June 2021: Attended New York *Bacillus* Interest Group Annual Meeting, New York University, NY (Virtual)

July 2020: Supposed to attend 2020 Gordon Research Conference on Microbial Stress Responses, S. Hadley, MA (cancelled due to Covid-19)

June 2019: Attended Regional Microbiology Educators' Network 16th Annual Teaching Conference, Saint Joseph's University, PA

July 2017: Attended 14th Annual Regional Microbiology Educators Student Research Symposium, Saint Joseph's University

July 2016: Discussion leader at 2016 Gordon Research Conference on Microbial Stress Responses, S. Hadley, MA

July 2014: Attended 11th Annual Regional Microbiology Educators Student Research Symposium, Penn State Berks, Reading, PA

May 2014: Attended American Society for Microbiology, General Meeting, Boston, MA

July 2013: Attended 10th Annual Regional Microbiology Educators Student Research Symposium, Swarthmore College

June 2013: Attended Regional Microbiology Educators' Network 10th Annual Teaching Conference, Swarthmore, PA

July 2012: Scientific reviewer for National Institutes of Health Special Initiatives Study Section

July 2012: Attended 9th Annual Regional Microbiology Educators Student Research Symposium, Swarthmore College

March 2012: Scientific reviewer for National Institutes of Health Special Initiatives Study Section

December 2011: Attended the 16th International Symposium on the Biology of Actinomycetes (ISBA XVI) – Puerto Vallarta, Mexico

June 2011: Attended Regional Microbiology Educators' Network 8th Annual Teaching Conference, Swarthmore, PA

June 2011: Attended New York *Bacillus* Interest Group Annual Meeting – New York University, NY

March 2011: Scientific reviewer for American Society for Microbiology – Undergraduate Research Fellowships

March 2010: Scientific reviewer for National Science Foundation, Division of

Cellular and Molecular Biosciences

June 2009: Attended Regional Microbiology Educators' Network 6th Annual Teaching Conference, Swarthmore, PA

July 2008: Attended Gordon Research conference on Microbial Stress Responses, S. Hadley, MA

June 2008: Attended Regional Microbiology Educators' Network 5th Annual Teaching Conference, Swarthmore, PA

July 2006: Attended Gordon Research conference on Microbial Stress Responses, S. Hadley, MA

May 2002: Attended American Society for Microbiology General Meeting, Salt Lake City, UT

June 1996: Attended International Spores Conference, Madison, WI

PROFESSIONAL
AFFILIATIONS

American Society for Microbiology

TEACHING
EXPERIENCE

Bryn Mawr College
Associate Professor Fall 2013-present
Assistant Professor Fall 2007 - 2013

BIO 101: Introductory Biology
BIO 110: Biological Explorations
BIO 255: Microbiology (lecture and lab)
BIO 375: Integrated Biochemistry and Molecular Biology I (lecture and lab)
BIO 376: Integrated Biochemistry and Molecular Biology II (lecture and lab)
BIO 391: Senior Seminar in Biochemistry
BIO 399: Senior Seminar in Laboratory Investigations
BIO 400: Supervised Research (Biology)
BIO 403: Supervised Research (Biology)
CHEM 399: Supervised Research (Chemistry)

Mount Holyoke College Visiting Assistant Professor Spring semester 2006
Taught an upper level Biochemistry course on "Nucleic Acids Biochemistry and Molecular Biology"; served on five thesis committees; supervised undergraduate students in the laboratory.

Mount Holyoke College Guest Lecturer Fall semester 2005
Lectured on cellular metabolism, thermodynamics and bioenergetics in an upper-level biochemistry class on "Protein Biochemistry and Cellular Metabolism"

University of Connecticut Medical School Facilitator Fall semester 1997
Co-taught a Comprehensive Medical Problem Solving class to first year medical students; evaluated and graded students.

Mount Holyoke College Fall 1990 – Spring 1993
Teaching assistant in undergraduate introductory and advanced Organic Chemistry laboratories

RESEARCH STUDENTS SUPERVISED AT BRYN MAWR

Holly Stewart, '08
Nicki Zelenski, '08
Katherine Weng '09
Rica Dela Cruz '10
Yang Gao, '10
Sahitya Penumetcha '10
Natalie Mackow '12
Rebecca Sheplock '12
Jillian Galloway '13
Jessica Watkins '13
Nawar Naseer '14
Kaeun Bae '15
Fiona Gambanga '15
Han Wang, '15
Alice Bell '16
Shayoni Nag '16
Wenzhi Song '17
Hope Walsh '17
Ketki Chinoy '18
Mariam Haider '18
Malini Sharma '18
Anran Huang '19
Mercette Ohlwiler HC'19
Genesis Perez-Melara '19
Emma Nikols '21
Emma Yoder '21
Lana Hwang '23
Anna Miller '23
Tillie Ripin ,23

EXTRAMURAL POSTERS BY UNDERGRADUATE RESEARCH STUDENTS

Mariam Haider* and Monica Chander (July 2017)
Identification of the physiological activator of SoxR in *Streptomyces coelicolor*
13th Annual Regional Microbiology Educators Student Research Symposium,
Saint Joseph's University

Anran Huang* and Monica Chander (July 2017)
Investigating the protective function of SoxR in *Streptomyces coelicolor*
13th Annual Regional Microbiology Educators Student Research Symposium,
Saint Joseph's University

Malini Sharma* and Monica Chander (July 2017)

Determining the function of EcaB, a SoxR regulated monooxygenase in *Streptomyces coelicolor*
13th Annual Regional Microbiology Educators Student Research Symposium,
Saint Joseph's University

Alice Bell* and Monica Chander (April 2016)

Activation of SoxR in *Streptomyces coelicolor*: The *actVI-orf2* mutant
Thomas Jefferson University Chapter of Sigma Xi Student Research Day

Wenzhi Song* and Monica Chander (April 2016)

Identification of the SoxR activator in *Streptomyces coelicolor* utilizing null mutants of *actVA-orf5* and *actVA-orf6* in the actinorhodin biosynthetic pathway
Thomas Jefferson University Chapter of Sigma Xi Student Research Day

Kaeun Bae* and Monica Chander (October 2014)

Understanding how *Streptomyces coelicolor* avoids destruction by endogenously-produced antibiotics
17th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences, University of Maryland, Baltimore County

Nawar Naseer* and Monica Chander (November 2013)

Identification of SoxR-dependent genes in *S. coelicolor* using RNA-Seq
Temple University School of Medicine

Nawar Naseer* and Monica Chander (July 2013)

Identification of SoxR-dependent genes in *S. coelicolor* using RNA-Seq
10th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Han Wang* and Monica Chander (July 2013)

Function of a SoxR-regulated ABC transporter and monooxygenase enzyme in *S. coelicolor*
10th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Jillian Galloway* and Monica Chander (July 2011)

Roses are red, Violets are blue, *Streptomyces* makes these colors too!
(Using Microarrays to Determine Additional SoxR Targets in *Streptomyces coelicolor*)
8th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Rebecca Sheplock* and Monica Chander (July 2011)

SoxR Response to Exogenous Redox-Cycling Drugs in *Streptomyces Coelicolor*
8th Annual Regional Microbiology Educators Student Research Symposium,

Swarthmore College

Jessica Watkins* and Monica Chander (July 2011)

Pseudomonas aeruginosa SoxR sensitivity to redox-cycling agents
8th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Rica Dela Cruz* and Monica Chander (July 2009)

Identification of the SoxR regulon in *Streptomyces coelicolor*
6th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Sahitya Penumetcha* and Monica Chander (July 2009)

Phenotypic characterization of a *soxR* null *Streptomyces coelicolor* mutant
6th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Yang Gao* and Monica Chander (July 2008)

Understanding the function of SoxR in *Streptomyces coelicolor* by
mutational analysis
5th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

Katherine Weng* and Monica Chander (July 2008)

Analyzing the regulation of *Streptomyces coelicolor* SoxR by actinorhodin
5th Annual Regional Microbiology Educators Student Research Symposium,
Swarthmore College

GRADUATE
STUDENT
SUPERVISORY
ROLES

Chair of Ph.D. supervising committee for Douglas Gisewhite
(Bryn Mawr College Chemistry Department/Sharon Burgmeyer)

Chair of Ph.D. supervising committee for Benjamin Williams
(Bryn Mawr College Chemistry Department/Sharon Burgmeyer)

Chair of Ph.D. supervising committee for Patricia Flaherty-Fishcette
(BMC School of Social Work and Social Research/Janet Shapiro)

Outside reader of Ph.D. thesis for David Recinos (Columbia University, NY)

COMMITTEES
SERVICE
OUTREACH

Fall 2022: Member of Biology Search Committee for Neurobiologist

Fall 2022: Member of Biology Search Committee for Physiologist

Fall 2022-Fall 2023: STEMLA Mentor

Fall 2020: Member of Biology Search Committee for Genomicist

Summer 2020: Ad hoc policy group (Covid-19)

Fall 2018: Chair of Biology Search Committee for Immunologist

2018-2020: Committee on International Students Experience

2018-2021: Curriculum Committee

Spring 2017: Chair of Search Committee for Interim Instructor for Immunology and Introductory Biology Labs

Fall 2016: Member of Search Committee for Microbiologist at Haverford College

Spring 2016: Chair of Biology Search Committee for Interim instructor for Biostatistics course

Spring 2016: Ad Hoc Review Committee for Maja Seselj (Anthropology Dept.)

Fall 2015: Chair of Biology Search Committee for Interim Introductory Biology lab instructor

Fall 2015: Chair of Biology Search Committee for Interim Molecular Biology instructor

Sept 2015 – 2020: Grand Marshal

June 2015 – December 2018: Chair of Biology Department

Spring 2015: Member of Biology Search Committee for Interim Geneticist and Physiologist

September 2014-2017: Faculty representative to the Administrative Board of the Academic Honor System

2014-2015: Pilot advisor for five first year students

May 2014 – May 2015: Assistant grand marshal

Fall 2013: Member of Biology Search Committee for Computational Ecologist

Commencement 2013: Faculty marshal

Spring 2013: Member of Biology Search Committee for Introductory Biology Instructor (CNTT)

Fall 2012: Member of Biology Search Committee for Genomicist

Fall 2012: Member of Chemistry Search Committee for Biochemist

September 2009-2012: Council on Undergraduate Academic Standing

January 2012: Invited speaker at Career Roundtable Discussion for Ph.D. candidates sponsored by Eastern Pennsylvania Association for the American Society for Microbiology, Drexel University, PA

Fall 2011: Member of Biology Search Committee for Ecologist

Summer 2011: Member of Biology Search Committee for Interim Genomicist

April 2011: Panelist at HHMI-sponsored College Careers Symposium, Haverford College, PA

August 2009: First year student advising

Fall 2008: Member of Biology Search Committee for Computational Ecologist

August 2008: First year student advising

July 2008: Moderated Ethics in Science for BMC Summer Science Research Program

Fall 2007: Member of Biology Search Committee for Evolutionary Developmental Biologist