



Curriculum vitae for Michael S. Cohen, PhD

Department of Physiology and Pharmacology
Program in Chemical Biology
Oregon Health & Science University
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Academic Training

University of California, San Francisco

PhD Chemistry and Chemical Biology, 2006

Doctoral Thesis title: Rational Design of Selective, Irreversible Kinase Inhibitors: A Structural Bioinformatics Approach

Doctoral Thesis Advisor: Jack Taunton

University of California, Irvine

BS Chemistry, 2000, *cum laude*, Phi Beta Kappa

Honors Thesis Title: Semisynthetic Myoglobins as Models for Hemeprotein Catalysis

Honors Thesis Advisor: Patrick J. Farmer

Research Appointments and Employment Record

2016-present, Associate Professor, Department of Physiology and Pharmacology, Program in Chemical Biology, Oregon Health & Science University, Portland, OR.

2011 (Nov.)-2016, Assistant Professor, Department of Physiology and Pharmacology, Program in Chemical Biology, Oregon Health & Science University, Portland, OR.

Affiliations

Member of the Program in Chemical Biology

Member of the Neuroscience Graduate Program

Member of the Graduate Program in Molecular and Cellular Biosciences

2006-2011, Life Sciences Research Foundation Postdoctoral Fellow, Weill Cornell Medical College, Cornell University, New York, NY.

2000-2006, Graduate Student, University of California, San Francisco, CA.

1998 (June to August), Undergraduate Research Fellow, University of California, San Francisco, CA.

Honors

Richard T. Jones New Investigator Award, Medical Research Foundation (2016)

Pew Biomedical Scholar (2015)

Whitehall Foundation Award (2013-2016)

Life Sciences Research Foundation Postdoctoral Fellow, Weill Cornell Medical College (2007-2011)

Phi Beta Kappa Graduate Scholarship (2005)

Achievement Rewards for College Scientists Fellowship (2001-2002)

Chancellor's award for Excellence in Undergraduate Research (2000)

Departmental Chemistry Honors, University of California, Irvine (2000)

Arnold and Mable Beckman Foundation Undergraduate Scholarship (1999-2000)

Publications

From OHSU (Independent Investigator)

36. **Cohen, M.S.** and Chang, P. "Insights into the biogenesis, function, and regulation of ADP-ribosylation," *Nature Chemical Biology*, in press (2018).
35. Kirby, I.T., Morgan, R.K., and **Cohen, M.S.** "A simple, sensitive, and generalizable plate assay for screening PARP inhibitors," *Methods in Molecular Biology*, in press (2018).
34. Morgan, R.K, and **Cohen, M.S.** "Detecting protein ADP-ribosylation using a clickable aminoxy probe," *Methods in Molecular Biology*, **1601**, 71 (2017).
33. **Cohen, M.S.** "Axon Degeneration: Too Much NMN is Actually Bad," *Current Biology*, **27**, R310 (2017).
32. Thorsell, A.G., Ekblad, T. Karlberg, T., Low, M., Pinto, A.F., Tresaugues, L., Moche, M., **Cohen, M.S.**, and Schuler, H. "Structural Basis for Potency and Promiscuity in Poly(ADP-ribose) Polymerase (PARP) and Tankyrase Inhibitors," *Journal of Medicinal Chemistry*, **60**, 1262 (2017).
31. Cambronne, X.A.*, Stewart, M.L. Kim, D.H., Jones-Brunette, A., Morgan, R.K., Farrens, D.L., **Cohen, M.S.***, Goodman, R.H. "Biosensor reveals multiple sources for mitochondrial NAD⁺," *Science*, **352**, 1474 (2016).
*corresponding authors

Featured in:

- Perspectives: *Science*, **352**, 1396 (2017)
- Research Highlights: *Nature Methods*, **13**, 610 (2017)

30. Barrett, R.M., Liu, H.W., Jin, H., Goodman, R.H., and **Cohen, M.S.** "Cell-specific Profiling of Nascent Proteomes Using Orthogonal Enzyme-mediated Puromycin Incorporation," *ACS Chemical Biology*, **11**, 1532 (2016).
29. Huang, J., Wang, K., Vermehren-Schmaedick, A., Adelman, J., **Cohen, M.S.** "PARP6 is a regulator of Hippocampal Dendritic Morphogenesis," *Scientific Reports*, **6**, 18512 (2016).
28. Carter-O'Connell, I.O., Jin H., Morgan, R.K., David, L.L., and **Cohen, M.S.** "Identifying Family-member Specific Targets of Mono-ARTDs Using a Chemical Genetic Approach," *Cell Reports*, **14**, 621(2016).
27. Morgan, R.K., Carter-O'Connell, I.O., and **Cohen, M.S.** "Selective inhibition of PARP10 using a chemical genetics strategy," *Bioorganic Medicinal Chemistry Letters*, **25**, 4770 (2015).
26. Morgan, R.K. and **Cohen, M.S.** "A Clickable Aminoxy Probe for Monitoring Cellular ADP-ribosylation," *ACS Chemical Biology*, **10**, 1778 (2015).
25. Carter-O'Connell, I.O. and **Cohen, M.S.** "Identifying Direct Protein Targets of Engineered Poly-ADP-ribose Polymerases (PARPs) Using Modified Nicotinamide Adenine Dinucleotide Reporters," *Current Protocols in Chemical Biology*, (2015).
24. Carter-O'Connell I.O, Jin H., Morgan R.K., David L.L., **Cohen M.S.*** "Engineering the substrate specificity of ADP-ribosyltransferases for identifying direct protein targets," *Journal of the American Chemical Society* **136**, 5201. (2014).

Featured in:

- F1000 prime
- Chemistry and Engineering News* "concentrates."

Pre-OHSU

23. Colak D., Zaninovic N., **Cohen M.S.**, Rosenwaks Z., Yang W.Y., Gerhardt J., Disney M.D., **Jaffrey S.R.** "Promoter-bound trinucleotide repeat mRNA drives epigenetic silencing in fragile X syndrome," *Science* **343**, 1002 (2014).
22. Curanovic, D., **Cohen, M.S.**, Slagle, C.E., Singh, I., Leslie, C.S., and Jaffrey, S.R. "Transcriptome-wide profiling of stimulus-induced polyadenylation in living cells using a poly(A) trap," *Nature Chemical Biology* **9**, 671(2013).

21. Serafimova, I.M., Pufall, M.A., Krishnan, S., Duda, K., **Cohen, M.S.**, Maglathlin, R.L., McFarland, J.M., Miller, R.M., Frodin, M., and Taunton, J. "Reversible targeting of noncatalytic cysteines with chemically tuned electrophiles," *Nature Chemical Biology* **8**, 471 (2012).
20. **Cohen, M.S.**, Ghosh, A., and Jaffrey, S.R. "Chemical Genetic-Mediated Spatial Regulation of Protein Expression in Neurons Reveals an Axonal Function for Wld^S," *Chemistry and Biology*, **19**, 179 (2012).
19. **Cohen, M.S.**, Bas Orth, C., Kim, H.J., Jeon, N.L., and Jaffrey, S.R. "Neurotrophin-mediated dendrite to nucleus signaling revealed by microfluidic compartmentalization of dendrites," *PNAS*, **108**, 11246 (2011).
18. Kinter D.B., Chen X., Currie J., Chanana V., Ferrazzano, P., Baba, A., Matsuda, T., **Cohen, M.S.**, Orlowski J., Chiu, S.Y., Taunton, J., Sun, D. "Excessive Na⁺/H⁺ exchange in disruption of dendritic Na⁺ and Ca²⁺ homeostasis and mitochondrial dysfunction following in vitro ischemia," *Journal of Biological Chemistry*, **285**, 35155 (2010).
17. Lee, S., Shuman, J.D., Guszczynski, T., Sakchaisri, K., Sebastian, T., Copeland, T.D., Miller, M., **Cohen, M.S.**, Taunton, J., Smart R.C., Xiao Z., Yu L.R., Veenstra, T.D., Johnson, P.F. "RSK-mediated phosphorylation in the C/EBP{beta} leucine zipper regulates DNA binding, dimerization, and growth arrest activity," *Mol. Cell Biol.*, **30**, 2621 (2010).
16. Doehn, U., Hauge, C., Frank, S.R., Jensen, C.J., Duda K., Nielsen J.V., **Cohen M.S.**, Johansen J.V., Winther, B.R., Lund, L.R., Winther, O., Taunton, J., Hansen, S.H., Frödin M. "RSK is a principal effector of the RAS-ERK pathway for eliciting a coordinate promotile/invasive gene program and phenotype in epithelial cells," *Molecular Cell*, **35**, 511 (2009).
15. Chaturvedi, D., **Cohen, M.S.**, Taunton, J., Patel, T.B. "The PKARI{alpha} Subunit of Protein Kinase A Modulates the Activation of p90RSK1 and Its Function," *Journal of Biological Chemistry*, **284**, 23670 (2009).
14. Chaturvedi, D., Gao, X., **Cohen, M.S.**, Taunton, J., Patel, T.B. "Rapamycin induces transactivation of the EGFR and increases cell survival," *Oncogene*, **28**, 1187 (2009).
13. Dehan, E., Bassermann, F., Guardavaccaro, D., Vasiliver-Shamis, G., **Cohen, M.S.**, Lowes, K.N., Dustin, M., Huang, D.C., Taunton, J., Pagano, M. "betaTrCP-and Rsk1/2-mediated degradation of BimEL inhibits apoptosis," *Molecular Cell*, **33**, 109 (2009).
12. Visintin, C, Tomson, B.N., Rahal, R., Paulson, J., **Cohen, M.S.**, Taunton, J., Amon, A., Visintin, R. "APC/C-Cdh1-mediated degradation of the Polo kinase Cdc5 promotes the return of Cdc14 into the nucleolus," *Genes and Development*, **22**, 79 (2008).
11. Snead, J.L., Sullivan, M.J., Lowery, D.M., **Cohen, M.S.**, Randle, D.H., Taunton, J., Yaffe, M.B., Morgan, D.O., Shokat, K.M. "A coupled chemical genetic and bioinformatics approach to Polo-like kinase pathway exploration," *Current Biology*, **14**, 1261 (2007).
10. Kang, S., Dong, S., Tinglei, G., **Cohen, M.S.**, Lonial, S., Khoury, H.J., Cohen, P., Fabbro, D., Gilliland, D.G., Taunton, J., Polakiewicz, Chen, J. "FGFR3 activates RSK2 to mediate hematopoietic transformation through both tyrosine phosphorylation of RSK2 and activation of the MEK/ERK pathway," *Cancer Cell*, **12**, 201 (2007).
9. **Cohen, M.S.**, Hadjivassiliou, H., and Taunton, J. "A Clickable inhibitor reveals Context-dependent RSK autoactivation," *Nature Chemical Biology*, **3**, 156 (2007).
- Featured in:
- Cover story
 - News and Views: *Nature Chemical Biology*, **3**, 138 (2007)
8. Roux, P.P., Shahbazian, D., Vu, H., Holz, M.K., **Cohen, M.S.**, Taunton, J., Sonenberg, N., Blenis, J. "RAS/ERK signaling promotes site-specific ribosomal protein S6 phosphorylation via RSK and stimulates cap-dependent translation," *Journal of Biological Chemistry*, **282**, 14056 (2007).
7. Hetzer, C., Bisgrove, D., **Cohen, M.S.**, Pedal, A., Kaehlcke, K., Speyerer, A., Bartscherer, K., Taunton, J., Ott, M. "Recruitment and Activation of RSK2 by HIV-1 Tat," *PLoS ONE*, **2**, e151 (2007).

6. Cuello, F., Snabaitis, A.K., **Cohen, M.S.**, Taunton, J., Avkiran, M. "Evidence for direct regulation of myocardial NHE1 phosphorylation and activity by RSK: effects of the novel and specific RSK inhibitor fmk on responses to α -1-adrenergic stimulation," *Molecular Pharmacology*, **71**, 799 (2007).
5. Shahbazian, D., Roux, P.P., Mieulet, V., **Cohen, M.S.**, Raught, B., Taunton, J., Hershey, J.W.B., Blenis, J., Pende, M., and Sonenberg, N. "The mTOR/PI3K and MAPK pathways converge on eIF4B to control its phosphorylation and activity," *EMBO Journal*, **25**, 2781 (2006).
4. **Cohen, M.S.**, Zhang, C., Shokat, K.M., and Taunton, J. "Structural bioinformatics-based design of selective, irreversible kinase inhibitors," *Science*, **308**, 1318 (2005).

Featured in:

- Perspectives: *Science*, **308**, 1266 (2005)
- Science Concentrates: *C&E News*, **83**, 32 (2005)
- Highlights: *Nature Biotechnology*, **23**, 831 (2005)

3. Immoos, C.E., Di Bilio, A.J., **Cohen, M.S.**, Van der Veer, W., Gray, H.B., and Farmer, P.J. "Electron-transfer chemistry of Ru-linker-(heme)-modified myoglobin: rapid intraprotein reduction of a photogenerated porphyrin cation radical," *Inorganic Chemistry*, **43**, 3593 (2004).
2. Koo, L.S., Immoos, C.E., **Cohen, M.S.**, Farmer, P.J., and Ortiz de Montellano, P.R. "Enhanced electron transfer and lauric acid hydroxylation by site-directed mutagenesis of CYP119," *Journal of the American Chemical Society*, **124**, 5684 (2002).
1. Immoos, C.E., Bhaskar, B., Cohen, M.S., Barrows, T., Farmer, P.J., and Poulos, T.L. "Mesopone cytochrome c peroxidase: functional model of heme oxygenated oxidases," *Journal of Inorganic Biochemistry*, **91**, 635 (2002).

US Patents/Applications

Cohen, M.S., Carter-O'Connell, I., Morgan, R., and Jin, H. "Compounds and methods used in assessing mono-parp activity," U.S. Patent application 15/356,040 (2017).

Goodman, R.H., **Cohen, M.S.**, Cambronne, X.A., Stewart, M. "Biosensors that detect NAD⁺," U.S. Patent application 14/948,161 (2016).

Cohen, M.S., Barrett, R., Jin, H. "Cell specific labeling of newly synthesized proteins," U.S. Patent application 14/978,700 (2016).

Taunton, J., **Cohen, M.S.**, Shokat, K.M., and Zhang, C. "Selective serine/threonine kinase inhibitors," U.S. Patent 7,687,506 Mar. 30 (2010).

Invited talks

Sanford Burnham Prebys Institute (San Diego, CA, January 2018)
 OHSU Chemical Biology and Physiology conference (Portland, OR, December 2017)
 Stanford Research Institute (Menlo Park, CA, November 2017)
 University of Southern California, Department of Chemistry (Los Angeles, CA, November 2017)
 Cal Poly San Luis Obispo, Department of Chemistry (San Luis Obispo, CA, November 2017)
 FASEB meeting, "NAD metabolism and signaling" (New Orleans, LA, July 2017)
 St. Jude Children's Research Hospital, Chemical Biology and Therapeutics (Memphis, TN, May 2017)
 HHMI Janelia conference, "Chemical Tools for Complex Biological Systems" (Asburn, VA, April 2017)
 Oregon State University, Department of Biochemistry (Corvallis, OR, February 2017)
 Purdue University, Department of Chemistry (Purdue, IN, December 2016)
 Ribon Therapeutics (Lexington, MA, December 2016)
 Whitman College, Department of Chemistry (Walla Walla, WA, October 2016)
 Gordon Research Conference, Bioorganic Chemistry (Proctor Academy, NH, June 2016)
 Johns Hopkins University, Department of Biochemistry and Molecular Biology (Baltimore, MD, November 2015)
 Karolinska Institute, Physiological Chemistry (Stockholm, Sweden, August 2015)

FASEB meeting, "NAD metabolism and signaling" (Timmendorfer Strand, Germany, August 2015)
Beckman Young Investigator Finalist seminar (Irvine, CA, June 2014)
Cold Spring Harbor Laboratory Meeting, "PARP Family and Friends: Gene Regulation and Beyond" (Cold Spring Harbor, NY, April 2014)
OHSU Institute of Environmental Health, seminar series (Portland, OR, December 2014)
University of Washington, Department of Biological Structure symposium series (Seattle, WA, June 2013)
Princeton University, Department of Chemistry, special seminar series (Princeton, NJ, January 2011)

Membership in Professional Societies

American Chemical Society, 2000-present
Society for Neuroscience, 2011-present
Phi Lambda Upsilon Chemistry Honors Society, 2000-present

Granting Agency Review Work

National Science Foundation, *ad hoc*
National Institutes of Health, SBCA study section, *ad hoc*

Editorial and Ad Hoc Review Activities

Review activities: *Nature Chemical Biology*, *Current Biology*, *PNAS*, *Cell Chemical Biology*, *Journal of the American Chemical Society*, *Journal of Medicinal Chemistry*, *ACS Chemical Biology*, *Biochemistry*, and *Molecular Pharmacology*

Scientific Advisory Board: Chemical Probes

Other activities

Co-organizer of the "Chemical Biology and Physiology" conference, OHSU (Portland, OR, December 2017).

Trainees to date

Graduate Students:

Current:

Ilsa Kirby, BA (Reed College)
Kelsie Rodriguez, BS (California State University, Monterey Bay)

Former:

Rory Morgan, PhD

Thesis: "Development of Chemical Tools for Investigating the Functional Roles of the Poly (ADP-ribose) Polymerase (PARP) Family"

Current position: Postdoctoral fellow, Vollum Institute

Postdocs:

Current:

Anke Vermehren-Schmaedick, PhD (Tufts University)
Sunil Sundalam, PhD (Portland State University)

Former:

Ian Carter-O'Connell, PhD (Harvard University)

Current position: Assistant Professor, Santa Clara University

Raashi Sreenivasan, PhD (University of Wisconsin, Madison)

Current position: Postdoctoral fellow, Stanford University (Herschlag lab)

Jeff Huang, PhD (Rosalind Franklin University)

Current position: Research Scientist, Children's Hospital of Orange County

Technicians:

Current:

Moriah Arnold, BA (Carleton college)

Former:

Madison Levinson, BA (Lewis and Clark University)

Current position: Applying to graduate school

Undergraduate students:

Current:

Jasmin Bovy (Portland State University)

Former:

Madeleine Breshears (Bard College)

Current position: Undergraduate student, Bard College

Reid Kinser, BS (Oregon State University)

Current position: Graduate student, UCSF

Clara Herrera, BA (Reed College)

Current position: Graduate student, UCSF

A. Zachary Candelaria (University of New Mexico)

Current position: Undergraduate student, McNair Scholar, University of New Mexico

High school students:

Former:

Timothy Welsh

Current position: Undergraduate student, University of Washington, Seattle (just accepted to Berkeley Chemistry program)

Hiya Banerjee

Current position: Undergraduate student, Tufts University