

MOLLY B. SCHMID, Ph.D.

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Dr. Schmid spent over ten years in the biotechnology industry in scientific and leadership positions, and also has had a significant academic career in both science and management. Currently, she is engaged in a variety of roles that aim to improve and expand the entrepreneurial ecosystem in Southern California, especially for technology-based startups.

BUILDING SOCIAL STARTUP ECOSYSTEM

Startup Consultant – *helping tech-based startups make plans, find funding*

- Small Business Development Center, Pasadena City College **2022-present**
Business Consultant, SBIR funding specialist
- Small Business Development Center, UCI Beall Applied Innovation **2012-2022**
Business Consultant, SBIR funding specialist
- UCI Beall Applied Innovation **2019-present**
SBIR/STTR Consultant for UC Irvine startup companies

Innovate Claremont Leadership Group

Town/Gown grassroots organization to make Claremont a good home for entrepreneurs **2018-present**

Tech Coast Angels, Inland Empire

Member **2008 -present**
Biomedical/Life Sciences Prescreening group, Orange County network **2020-present**
Board of Governors **2021-2023**

ACADEMIC

USC Marshall School of Business, Lloyd Greif Center for Entrepreneurial Studies **2015-2019, 2023**
Adjunct Professor of Entrepreneurship
Course BAE-561 (MBA level) – Life Science Entrepreneurship
(elective, not given 2020-2022)

Alfred Mann Institute of Bioengineering at USC **2015-2022**
Entrepreneur-in-Residence

UCLA Anderson School of Management **2015-2022**
Faculty Advisor, Global Access Program (GAP)

Keck Graduate Institute of Applied Life Sciences **2005–2012**
Professor and Entrepreneur-in-Residence (2006–2012)
Interim Director of Research (2006 – 2008)
Joe and Vi Jacobs Visiting Professor (2005 – 2006)

- Teaching: Drug Discovery & Development; Applied Entrepreneurship; Advanced Drug Discovery; Phase I Drug Development
- Faculty Advisor, Team Master's projects: Applied Biosystems; Beckman-Coulter; Theravance; Life Technologies

Princeton University, Department of Molecular Biology **1986–1993**
Assistant Professor

- \$2M research funding from NIH, NSF, ACS, Searle/Chicago Community Trust
- Consultant – Bristol-Myers Squibb, Pfizer, Microcide Pharmaceuticals

INDUSTRY**ieCrowd, Riverside CA****2014-2015***Vice President, Life & Health Technologies*

Olfactor Laboratories, Inc. – novel technology based on insect olfaction to discover new mosquito and other insect control products. Coached staff to transform the discovery technology into commercialization-ready product development. Created target product profiles, product development timelines.

Affinium Pharmaceuticals, Inc., Toronto, Canada**2001–2004**

High throughput protein structure determination used “early and often” for structure-guided small molecule drug discovery

Senior Vice President, Preclinical Programs

- Partnerships – PFE, 3 year, \$15M
- \$3MM GSK Ventures preclinical asset acquisition
- Grant - NIH, U01AI057291, \$5,859,879
- Lead technical exec for corporate/venture financing

Genencor International, Inc., Palo Alto, California**2000–2001**

Industrial enzymes discovery & development

Senior Director, Functional Genomics & Bioinformatics

- ~50FTE genomics and informatics staff in US and NL

Microcide Pharmaceuticals, Inc., Mountain View, California**1994–2000**

Discovery/early development company that used genomic technologies to discover novel small molecule anti-infectives

*Vice President, Research Alliances & Senior Biologist (1999-2000)**Director of Discovery Biology & High Throughput Screening (1995-1998)**Associate Director of Biology (1994-1995)*

- Growth 6FTE to 160FTE, 1994-1997
- Partnerships - PFE– 5 year, \$20M; JNJ– 3 year, \$15M, IND/Phase I; Daiichi– 4 year, \$15M
- IPO (NASDAQ: MCDE), 1996, \$35M

EDUCATION

Research Fellow, University of Oregon (Dr. Peter von Hippel, Advisor)

1982–1986

Ph.D., Biology, University of Utah (Dr. John Roth, Advisor)

1981

B.S., Biology, SUNY Albany (Dr. David Shub, Advisor)

1976

ACADEMIC & PROFESSIONAL HONORS

Fellow, American Institute of Medical and Biomedical Engineers

2016

Fellow, American Academy of Microbiology

1998

Searle Scholar Award, The Chicago Community Trust

1986–1989

Damon Runyon/Walter Winchell Postdoctoral Fellowship

1982–1984

PROFESSIONAL SERVICE (selected, since 2005)

2000-2023 Peer reviewer, NIH – SBIR, NIAID, NHLBI

2007-9 Board of Directors, C3-Jian, Inc.

2005-7 National Academy of Sciences panel “Metagenomics: Challenges and Functional Applications”

CONTRIBUTIONS TO SCIENCE

1. Discovery and characterization of the genetic target of fluoroquinolone antibiotics (Topoisomerase IV)
 - Schmid, M.B. (1990). A locus affecting nucleoid segregation in *S. typhimurium*. *J. Bacteriol.* 172, 5416-5420.
 - Luttinger, A.L., Springer, A.L., Schmid, M.B. (1991). A cluster of genes that affects nucleoid segregation in *S. typhimurium*. *New Biol.*, 3, 687-697.
 - Adams, D.E., Shekhtman, E.M., Zechiedrich, E.L., Schmid, M.B., Cozzarelli, N.R. (1992) The role of topoisomerase IV in partitioning bacterial replicons and the structure of catenated intermediates in DNA replication. *Cell* 71, 277-288.
 - Schmid, M.B., Sawitzke, J.A. (1993) Multiple bacterial topoisomerases: specialization or redundancy? *BioEssays* 15, 445-449.
 - Springer, A. L., M. B. Schmid (1993) Molecular characterization of the *S. typhimurium parE* gene. *Nucl. Acids Res.* 21, 1805-1809.
 - Gari, E. Figueroa-Bossi, N. Blanc-Potard, A.B., Spirito, F, Schmid, M.B., Bossi, L. (1996) A class of gyrase mutants of *Salmonella typhimurium* show quinolone-like lethality and require Rec functions for viability. *Molec. Microb.* 21, 111-122.
 - Khodursky A.B., Peter B.J., Schmid M.B., DeRisi J., Botstein D., Brown P.O., Cozzarelli N.R. (2000) Analysis of topoisomerase function in bacterial replication fork movement: use of DNA microarrays. *Proc. Natl. Acad. Sci. USA* 97: 9419-9424.

2. Creation of genetic strategies for identifying new antibiotic targets
 - Schmid, M.B., Kapur, N., Isaacson, D.R., Lindroos, P. and Sharpe, C. (1989). Genetic analysis of temperature sensitive lethal mutants of *Salmonella typhimurium*. *Genetics* 123, 625-633.
 - Gupta, S.D., Gan, K., Schmid, M.B., Wu, H.C. (1993) Characterization of a temperature-sensitive mutant of *Salmonella typhimurium* defective in apolipoprotein N-acyltransferase. *J. Biol. Chem.* 268, 16551-16556.
 - Gan, K., Gupta, S.D., Sankaran, K., Schmid, M.B., Wu, H.C. (1993) Isolation and characterization of a temperature sensitive mutant of *S. typhimurium* defective in prolipoprotein modification. *J. Biol. Chem.* 268, 16544-16550.
 - Dombrosky, P.M., Schmid, M.B., Young, K.D. (1994) Sequence divergence of the *murB* and *rrfI* genes from *Escherichia coli* and *Salmonella typhimurium*. *Arch. Microbiol.* 161:501-507.
 - Bostian, K.A., Schmid, M.B. (1997) New antibacterial targets and new approaches for drug discovery. *In: Antibacterial Therapy: Achievements, Problems and Future Perspectives*. Eds. Busse, W.-D., Zeiler, H., -J., Labischinski, H. Springer Verlag, Berlin.
 - Schmid, M.B. (1998) Novel approaches to the discovery of antimicrobial agents. *Curr. Op. Chem. Biol.* 2: 529-534.
 - Martin, P.K., Li, T., Sun, D., Biek, D.P., Schmid, M.B. (1999) Role in cell permeability of an essential two-component system in *Staphylococcus aureus*. *J. Bacteriol.* 181: 3666-3673.
 - Schmid, M.B. (2001) New targets and strategies for identification of novel classes of antibiotics. *In: Antibiotic Resistance and Antibiotic Development*. Eds. D. Hughes, D. Andersson. Harwood Academic Publishers: London pp. 197-208.
 - Schmid, M.B. (2001) Microbial genomics – new targets, new drugs. *Expert Opin. Ther. Targets.* 5: 465-475.
 - Schmid, MB. (2001) Use of genomics for enzyme-based drug discovery. *In: Enzyme Technologies for Pharmaceutical and Biotechnical Applications*. Eds. H. Kirst, W.-K. Yeh, M. Zmiejewski. Marcel-Dekker Publishers (NY) pp. 515-536.
 - Kaczmarek FS, Zaniewski RP, Gootz TD, Danley DE, Mansour MN, Griffor M, Kamath AV, Cronan M, Mueller J, Sun D, Martin PK, Benton B, McDowell L, Biek D, Schmid MB. (2001) Cloning and functional characterization of an NAD(+)-dependent DNA ligase from *Staphylococcus aureus*. *J Bacteriol.* 183:3016-24.

- Martin PK, Bao Y, Boyer E, Winterberg KM, McDowell L, Schmid MB, Buysse JM. (2002) Novel locus required for expression of high-level macrolide-lincosamide-streptogramin B resistance in *Staphylococcus aureus*. *J Bacteriol.* 184:5810-3.
 - Benton B.M, Zhang JP, Bond S, Pope C, Christian T, Lee L, Winterberg KM, Schmid MB, Buysse JM. (2004) Large-scale identification of new genes required for full virulence of *Staphylococcus aureus*. *J. Bacteriol.* 186: 8478-89.
 - Schmid, MB. (2006) Do targets limit antibiotic discovery? *Nature Biotech.* 24: 419-20.
 - Schmid, MB. (2013) Conditional lethality. *In: In: S Maloy, K Hughes, editors. Brenner's Encyclopedia of Genetics*, 2nd edition, Academic Press, San Diego. Chapter 315.
 - US PATENT 5,962,249 Sized-based marker identification technology. Benton, B.; Bostian, K.; Schmid, M.B.; Sun, D.; Buysse J.M. (1999)
 - US PATENTS 6,037,123; US 6,187,541; US 6,228,588; US 6,630,303; US 6,638,718 Methods of screening for compounds active on *Staphylococcus aureus* target genes. Benton, B.; Lee, V.; Malouin, F.; Martin, P.; Schmid, M.; Sun, D-X. (2000-2003)
 - US PATENT 6,514,746 *Staphylococcus aureus* histidine protein kinase essential genes. Benton, B.; Malouin, F.; Martin, P.; Schmid, M.; Sun, D-X. (2003)
3. Discovery of applications of structural genomics for new antibiotic discovery
- Schmid MB. (2002) Structural proteomics: the potential of high-throughput structure determination. *Trends in Microbiol.* 10: S27-31.
 - Berman, J, Burks, C, Hui, R, Schmid, MB. (2004) Structural proteomics - a new driving force in drug discovery. *Innovations in Pharmaceutical Technology* 4: 44-54.
 - Schmid MB. (2004) Seeing is believing: the impact of structural genomics on antimicrobial discovery. *Nature Microbiol. Reviews* 2:739-746.
 - Kimber MS, Martin F, Lu Y, Houston, S, Vedadi, M, Dharamsi, A, Fiebig KM, Schmid M, Rock CO. (2004) The Structure of (3*R*)-Hydroxyacyl–Acyl Carrier Protein Dehydratase (FabZ) from *Pseudomonas aeruginosa*. *J. Biol. Chem.* 279: 52593-52602.
 - Schmid, MB. (2006) Crystallizing new approaches for antibiotic drug discovery. *Biochem. Pharmacol.* *Biochem Pharmacol.* 71: 1048-56.
4. Characterization of small molecule inhibitor of Staphylococcal & Francisella enoyl-acyl carrier protein reductase – AFN-1252
- Kaplan, N, Albert, M, Awrey, D, Bardouniotis, E, Berman, J, Clarke, T, Dorsey, M, Hafkin, B, Ramnauth, J, Romanov, V, Schmid, MB, Thalakada, R, Yethon, J, Pauls, HW (2012) AFN-1252 – Mode of action, in vitro activity and in vivo efficacy of a selective anti-staphylococcal FabI inhibitor. *Antimicrob. Agents & Chemother.* 56: 5865-74.
 - US PATENT 7,601,526 Purified FabI polypeptides from Francisella tularensis Berman, J. M.; Schmid, M.B.; Awrey, D. E.; Clarke, T.; Beattie, B.; Dorsey, M. (2009)
 - US PATENT 7,879,872 Compositions comprising multiple bioactive agents, and methods of using the same Berman; J.M.; Schmid, M.B.; Mendlein, J.D.; Kaplan; N. (2011)
5. Discovery of functional consequences of chromosome rearrangements in bacteria
- Schmid, M.B., and Roth, J. R. (1980). Circularization of transduced fragments: A mechanism for adding segments to the bacterial chromosome. *Genetics* 94, 15-29.
 - Ciampi, M.S., Schmid, M.B., and Roth, J.R. (1982). The transposon Tn10 provides a promoter for transcription of adjacent sequences. *Proc. Natl. Acad. Sci. USA* 79, 6016-20.
 - Schmid, M.B., and Roth, J.R. (1983). Internal promoters of the histidine operon in *Salmonella typhimurium*. *J. Bacteriol.* 153, 1114-19.
 - Schmid, M.B., and Roth, J.R. (1983). Genetic methods for analysis and manipulation of inversion mutations. *Genetics* 105, 517-537.
 - Schmid, M.B., and Roth, J.R. (1983). Selection and endpoint distribution of bacterial inversion

- mutations. *Genetics* 105, 539-557.
- Schmid, M.B., and Roth, J.R. (1987). Gene location affects expression level in *Salmonella typhimurium*. *J. Bacteriol.* 169, 2872-75.
 - Schmid, M.B. (1988). Structure and function of the bacterial chromosome. *Trends in Biochem.* 13, 131-135.
6. Life Science and Technology Entrepreneurship
- Liu, H., Schmid, MB. (2009) Maturation of the biotechnology industry changes job opportunities for scientists. *J Commer Biotechnol.* 15: 199–214.
 - Schmid, MB, Darroch, J. (2009) Managing Fail Early Fail Fast Decisions in New Product Development. Product Development and Management Association 2009 International Research Forum, Anaheim CA.
 - Schmid, MB (2009) Inventor's Guide. 21pp. *Unpublished manuscript.*
 - Schmid, MB (2011) Mixing Business and Chemistry: Should I Consider a Professional Master's Degree? *The Distillate* (monthly ACS e-newsletter), May 2011.
<http://archive.constantcontact.com/fs019/1102375859602/archive/1105233810800.html>
 - Schmid, MB (2011) Transitioning From Industry to An Academic Career. *The Distillate* (monthly ACS e-newsletter).
<http://archive.constantcontact.com/fs019/1102375859602/archive/1106712509913.html>
 - Kondragunta U., Schmid, MB. (2011) Impact of Tech Coast Angels on Regional Economies - Phase I Analysis. *Unpublished manuscript*
 - Schmid, MB. (2011) Out of Balance: Supply & Demand for New Life Scientists in the US. (7 pp). *Unpublished manuscript.*
 - Schmid, MB. (2011) Life Science Entrepreneurship: Introduction to the Biotechnology Industry. (4pp). *Unpublished manuscript.*
 - Schmid, MB. (2013) Life Science Entrepreneurship: Inventor's Guide (9pp). *Unpublished manuscript.*
 - Schmid, MB. (2021) SBIR and STTR Awards in Orange County CA, 2016-2019. (33pp). *Unpublished report.*
 - Schmid MB. (2021) Women's Participation in SBIR/STTR Programs at UCI Beall Applied Innovation. (5pp). *Unpublished report.*
7. Media
- *Biotech: The High Stakes Table of Entrepreneurship* (forbes.com), 2012, Lori Kozlowski – interview with Molly Schmid on experiences in biotech.
 - *Repelling Mosquitoes With A Natural Sticky Patch | Here & Now* (wbur.org), 2014, interview with Molly Schmid on ieCrowd mosquito repellent technology.
 - “*Finding Funding*”, 2020 - <https://youtu.be/K47852P7Wyl> M. Schmid, University Lab Partners, Lunch and Learn workshop
 - “*Mining Federal Databases for Funding Opportunities*”, 2021, <https://youtu.be/sxigFJmIWLQ> M. Schmid, University Lab Partners, Lunch and Learn workshop
 - “*Valuing Your Early Stage Biotech Company*”, 2021, <https://youtu.be/dREYFSNrhoY> M. Schmid, University Lab Partners, Lunch and Learn workshop