

JOSEPH C. CHEN

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Education

- 1995 - 2001 **Harvard University**, Cambridge, MA.
Ph.D., Program in Biological and Biomedical Sciences, Division of Medical Sciences. Thesis advisor: Jon Beckwith, Dept. of Microbiology and Molecular Genetics, Harvard Medical School. Dissertation: The role of an essential membrane protein (FtsQ) in *Escherichia coli* cell division. **National Science Foundation Pre-doctoral Fellow.**
- 1991 - 1995 **Harvey Mudd College**, Claremont, CA.
Bachelor of Science in Biology (Honors). Graduated with High Distinction. Overall GPA: 3.95/4.00. Letters of Commendation received: general chemistry, mechanics, linear algebra, and the Freshman Division. Awards: **Barry M. Goldwater Scholarship, William K. Purves Prize in Biology, W. A. Brandenburger Prize, and Dean's List.**
- 1994 **Cambridge University**, Jesus College, Cambridge, U.K.
Pomona College Study Abroad Program. Course work included immunology, cell biology, English literature, European literature, and archaeology.

Professional Experience

- 2013 - present **Associate Professor, Dept. of Biology, San Francisco State University**, San Francisco, CA.
Research: bacterial factors that contribute to competitive advantage during infection of host plants by the nitrogen-fixing endosymbiont *Sinorhizobium meliloti*
- 2014 - 2015 **Visiting Faculty, Joint BioEnergy Institute**, Emeryville, CA.
Research: genome editing of *Escherichia coli* strains to improve production of desired compounds, regulated gene expression in diverse bacteria using synthetically designed promoters, application of CRISPR/Cas9.
- 2006 - 2013 **Assistant Professor, Dept. of Biology, San Francisco State University**, San Francisco, CA.
Research: cell polarity and subcellular architecture in the nitrogen-fixing bacterium *Sinorhizobium meliloti*; lactose metabolism in the freshwater bacterium *Caulobacter crescentus*; twin-arginine translocation in *Caulobacter*.
- 2002 - 2006 **Post-doctoral Fellow, Stanford University**, Stanford, CA.
Advisor: Lucy Shapiro, Dept. of Developmental Biology, School of Medicine. Topic: Regulated proteolysis in *Caulobacter* asymmetric cell division and polar differentiation. **Ruth L. Kirschstein National Research Service Award (National Institutes of Health).**
- 2001 **Intern, AstraZeneca Pharmaceuticals**, Waltham, MA.
Developed assays to confirm the mode of action of antifungal compounds in the candidate drug pipeline. Established tools for studying mechanisms of resistance in *Candida* species.
- 1996 **Teaching Fellow, Biological Sciences 10, Harvard University**, Cambridge, MA.
Organized and presented introductory molecular biology course material. Conducted review sessions. Graded homework and examinations.

- 1994 - 1995 **Research Assistant, Dept. of Biology, Harvey Mudd College**, Claremont, CA.
Generated mutant alleles of *merP*, which encodes a carrier protein involved in bacterial resistance to mercury. Research led to senior thesis: "Isolating mutant forms of MerP, a mercury-binding periplasmic protein." Supervised by Professor Nancy V. Hamlett.
- 1994 **Research Assistant, Dept. of Pathology, Cambridge University**, Cambridge, U.K.
Sequenced and analyzed three species of developmentally expressed tubulin cDNA clones from the protozoan parasite *Leishmania major*. Supervised by Dr. James W. Ajioka.
- 1993 **Research Intern, Dept. of Radiation Oncology, University of Pennsylvania**, Philadelphia, PA.
Isolated nuclei from mammalian cell cultures to examine thiol levels and structural integrity of the organelle as consequences of variations in the extraction procedure. Supervised by Dr. Cameron J. Koch. Sponsored by the Biomedical Graduate Studies Program.

Honors and Awards

- 2014 **Annual Biomedical Research Conference for Minority Students (ABRCMS) Judges' Travel Subsidy**. Received subsidy for conference registration and housing to participate as a judge for oral and poster presentations by students. ABRCMS is the largest professional conference for biomedical and behavior students in the country.
- 2008 **American Society for Microbiology (ASM) General Meeting Minority Travel Grant**
Grants are awarded to increase the participation of underrepresented minority (URM) groups in the ASM General Meeting. Received \$1500 to cover meeting-related expenses.
- 2007 **Faculty Affirmative Action Award**, San Francisco State University.
Internal award (3 weighted teaching units, WTU) to encourage participation of individuals traditionally underrepresented in their fields of study. Proposed to mentor minority undergraduates in research projects.
- 2007 **Vice President's Assigned Time Award**, San Francisco State University.
Internal award (3 WTU) in support of research, scholarship, and creative activity.
- 2003 - 2005 **Ruth L. Kirschstein National Research Service Award**, National Institute of General Medical Sciences (NIGMS), National Institutes of Health (NIH), Bethesda, MD. Competitive funding for post-doctoral research.
- 1995 - 1998 **NSF Pre-doctoral Fellowship**, National Science Foundation, Arlington, VA.
Competitive scholarship that provides three years of financial support for graduate study.
- 1994 - 1995 **Barry M. Goldwater Scholar**, Barry Goldwater Scholarship and Excellence in Education Foundation, Springfield, VA. The purpose of the Foundation, established by Congress in 1986, is to provide a continuing source of highly qualified scientists, mathematicians, and engineers by awarding scholarships to college students who intend to pursue careers in these fields.

Trainees

Master's Students: 25 total, of which 12 self-identify as underrepresented minorities; 2 current students included

Undergraduates: 29 total, of which 12 self-identify as underrepresented minorities; 2 current students included

Other: 17 total, including high school, foreign exchange, summer, and post-baccalaureate students

Research Funding

MRI: 1626611

NSF

Status: Active (1/1/2017 - 12/31/2019)

\$472,818 (total costs)

NSF Major Research Instrumentation (MRI): Acquisition of an Atomic Force Microscope to Enhance Research and Student Research Training in Engineering, Biochemistry, Biology and Physics departments at SF State Univ.

Role: Co-principal investigator.

SC3 GM096943

NIH/NIGMS

Status: Active (8/1/2016 - 7/31/2020)

\$448,500 (total direct + indirect costs)

NIH Support of Competitive Research (SCORE) Research Continuance (SC3) Award: Regulation of polar adhesion during *Sinorhizobium meliloti* infection. Role: principal investigator.

SC3 GM096943

NIH/NIGMS

Status: Completed (8/1/2012 - 7/30/2016)

\$457,140 (total direct + indirect costs)

NIH Support of Competitive Research (SCORE) Research Continuance (SC3) Award: Regulatory network of a conserved polar factor in *Sinorhizobium meliloti*. Role: principal investigator.

Entrepreneurial Joint Venture Grant

CSUPERB

Status: Completed (7/1/2014 - 11/30/2015)

\$22,319 (total costs)

Streamlining gene deletions in bacteria, in collaboration with the Joint BioEnergy Institute in Emeryville, CA. Role: principal investigator.

ORSP FOA 2010-01

SFSU ORSP

Status: Completed (7/1/2010 - 6/30/2011)

\$15,000 (total costs)

Facilitating Research and Creative Activity: Novel optical manipulation of biological samples. Role: co-principal investigator.

SC2 GM082318

NIH/NIGMS

Status: Completed (6/1/2008 - 4/30/2012)

\$344,969 (total direct + indirect costs)

NIH Minority Biomedical Research Support SCORE grant: Regulated assembly of subcellular structures in alpha-proteobacteria. Role: principal investigator.

SC2 GM082318-S1

NIH/NIGMS

Status: Completed (9/1/2010 - 4/30/2012)

\$34,664 (total direct + indirect costs)

NIH SCORE ARRA Administrative Supplement: Regulated assembly of subcellular structures in alpha-proteobacteria. Role: principal investigator.

Research Publications

Since joining SFSU

Peer-reviewed research articles

1. Ruegg, T.L., J.H. Pereira, **J.C. Chen**, A. DeGiovanni, P. Novichkov, V.K. Mutalik, G.P. Tomaleri, S. Singer, N.J. Hillson, B.A. Simmons, P. Adams, M.P. Thelens. 2018. Jungle Express is a versatile repressor for tight transcriptional control. *Nat Comm*. In Press.
2. Owens, M.T., G. Trujillo, S.B. Seidel, C.D. Harrison, K.M. Farrar, H.P. Benton, J.R. Blair, K.E. Boyer, J.L. Breckler, L.W. Burrus, D.T. Byrd, N. Caporale, E.J. Carpenter, Y.-H.M. Chan, **J.C. Chen**, L. Chen, L.H. Chen, D.S. Chu, W.P. Cochlan, R.J. Crook, K.D. Crow, J.R. de la Torre, W.F. Denetclaw, L.M. Dowdy, D. Franklin, M. Fuse, M.A. Goldman, B. Govindan, M. Green, H.E. Harris, Z.-H. He, S.B. Ingalls, P. Ingmire, A.R.B. Johnson, J.D. Knight, G. LeBuhn, T.L. Light, C. Low, L. Lund, L.M. Márquez-Magaña, V.C. Miller-Sims, C.A. Moffatt, H. Murdock, G.L. Nusse, V.T. Parker, S.G. Pasion, R. Patterson, P.S. Pennings, J.C. Ramirez, R.M.

- Ramirez, B. Riggs, R.V. Rohlf, J.M. Romeo, B.S. Rothman, S.W. Roy, T. Russo-Tait, R.N.M. Sehgal, K.A. Simonin, G.S. Spicer, J.H. Stillman, A. Sweig, L.C. Tempe, V.T. Vredenburg, S.L. Weinstein, A.G. Zink, L.A. Kelley, C.R. Domingo, K.D. Tanner. 2018. Collectively Improving Our Teaching: Attempting Biology Department-wide Professional Development in Scientific Teaching. *CBE: Life Sci Educ.* 17(1):ar2. PubMed PMID: 29326102; PubMed Central PMCID: PMC6007775.
3. Bezryadina, A., D. Preece, **J.C. Chen**, Z. Chen. 2016. Optical disassembly of cellular clusters by tunable “tug-of-war” tweezers. *Light Sci Appl.* 5, e16158. doi:10.1038/lsa.2016.158. PubMed PMID: 27818838; PubMed Central PMCID: PMC5091843.
 4. Samadi, A., C. Zhang, **J. Chen**, S.N.S. Reihani, and Z. Chen. 2015. Evaluating the toxic effect of an antimicrobial agent on single bacterial cells with optical tweezers. *Biomed Opt Express.* 6(1):112-7. doi: 10.1364/BOE.6.000112. PubMed PMID: 25657879; PubMed Central PMCID: PMC4317123.
 5. Mostafavi, M.**, J.C. Lewis**, T. Saini*, J.A. Bustamante*, I.T. Gao*, T.T. Tran*, S.N. King**, Z. Huang, and **J.C. Chen**. 2014. Analysis of a taurine-dependent promoter in *Sinorhizobium meliloti* that offers tight modulation of gene expression. *BMC Microbiol.* 14(1):295. PubMed PMID: 25420869; PubMed Central PMCID: PMC4254191. (** indicates Master’s student, while * indicates undergraduate, at SFSU.)
 6. Fields, A.T.*, C.S. Navarrete*, A.Z. Zare*, Z. Huang, M. Mostafavi*, J.C. Lewis*, Y. Rezaeihighighi*, B.J. Brezler*, S. Ray, A.L. Rizzacasa, M.J. Barnett, S.R. Long, E.J. Chen, and **J.C. Chen**. 2012. The conserved polarity factor PodJ1 impacts multiple cell envelope-associated functions in *Sinorhizobium meliloti*. *Mol Microbiol.* 84(5):892-920. PubMed PMID: 22553970; PubMed Central PMCID: PMC3359409. (* indicates Master’s student at SFSU.)
 7. Zhang, P., D. Hernandez*, D. Cannan*, Y. Hu, S. Fardad, S. Huang, **J.C. Chen**, D.N. Christodoulides, and Z. Chen. 2012. Trapping and rotating microparticles and bacteria with moiré-based optical propelling beams. *Biomed Opt Express.* 3(8): 1891-1897. PubMed PMID: 22876352; PubMed Central PMCID: PMC3409707. (* indicates student at SFSU.)
 8. Curtis, P.D., E.M. Quardokus, M.L. Lawler, X. Guo, D. Klein, **J.C. Chen**, R.J. Arnold, and Y.V. Brun. 2012. The scaffolding and signalling functions of a localization factor impact polar development. *Mol Microbiol.* 84(4):712-735. PubMed PMID: 22512778; PubMed Central PMCID: PMC3345042.
 9. Arellano, B.H.*, J.D. Ortiz*, J. Manzano*, and **J.C. Chen**. 2010. Identification of a dehydrogenase required for lactose metabolism in *Caulobacter crescentus*. *Appl Environ Microbiol.* 76(9): 3004-3014. PubMed PMID: 20190087; PubMed Central PMCID: PMC2863468. (* indicates undergraduate student at SFSU.)

Invited guest commentary or paper

1. Lamstein, J.**, A. Bezryadina, D. Preece, **J.C. Chen**, Z. Chen. 2017. Optical tug-of-war tweezers: shaping light for dynamic control of bacterial cells. *Chin Opt Lett.* 15(3): 030010. (** indicates Master’s student at SFSU.)
2. **Chen, J.C.** and C. Stephens. 2007. Bacterial cell cycle: completing the circuit. *Curr Biol.* 17(6): R203-6.

Prior to appointment at SFSU (peer-reviewed research articles)

1. **Chen, J.C.**, A.K. Hottes, H.H. McAdams, P.T. McGrath, P.H. Viollier, and L. Shapiro. 2006. Cytokinesis signals truncation of the PodJ polarity factor by a cell cycle-regulated protease. *EMBO J.* 25(2): 377-86.
2. Judd, E.M., L.R. Comolli, **J.C. Chen**, K.H. Downing, W.E. Moerner, and H.H. McAdams. 2005. Distinct constrictive processes, separated in time and space, divide *Caulobacter* inner and outer membranes. *J Bacteriol.* 187(20): 6874-82.
3. **Chen, J.C.**, P.H. Viollier, and L. Shapiro. 2005. A membrane metalloprotease participates in the sequential degradation of a *Caulobacter* polarity determinant. *Mol Microbiol.* 55(4): 1085-103.

4. **Chen, J.C.**, M. Minev*, and J. Beckwith. 2002. Analysis of *ftsQ* mutant alleles in *Escherichia coli*: complementation, septal localization, and recruitment of downstream cell division proteins. *J Bacteriol.* 184(3): 695-705.
5. **Chen, J.C.**, and J. Beckwith. 2001. FtsQ, FtsL and FtsI require FtsK but not FtsN for co-localization with FtsZ during *Escherichia coli* cell division. *Mol Microbiol.* 42(2): 395-413.
6. Boyd, D., D.S. Weiss, **J.C. Chen**, and J. Beckwith. 2000. Towards single-copy gene expression systems making gene cloning physiologically relevant: lambda InCh, a simple *Escherichia coli* plasmid-chromosome shuttle system. *J Bacteriol.* 182(3): 842-7.
7. **Chen, J.C.**, D.S. Weiss, J.-M. Ghigo, and J. Beckwith. 1999. Septal localization of FtsQ, an essential cell division protein in *Escherichia coli*. *J Bacteriol.* 181(2): 521-30.
8. Weiss, D.S., **J.C. Chen**, J.-M. Ghigo, D. Boyd, and J. Beckwith. 1999. Localization of FtsI (PBP3) to the septal ring requires its membrane anchor, the Z ring, FtsA, FtsQ, and FtsL. *J Bacteriol.* 181(2): 508-20.
9. Ghigo, J.-M., D.S. Weiss, **J.C. Chen**, J.C. Yarrow, and J. Beckwith. 1999. Localization of FtsL to the *Escherichia coli* septal ring. *Mol Microbiol.* 31(2): 725-37.
10. Coulson, R.M., V. Connor, **J.C. Chen**, and J.W. Ajioka. 1996. Differential expression of *Leishmani major* beta-tubulin genes during the acquisition of promastigote infectivity. *Mol Biochem Parasitol.* 82(2): 227-36.

Select Service Activities

A. Service at SFSU

- 2015 - present **Member, National Science Foundation REU Selection Committee**, Department of Biology
Review student applications for Research Experiences for Undergraduates (REU) summer program.
- 2015 - present **Safe Zone Ally**, SFSU
Faculty, staff, and administrators who received training to promote greater awareness of issues affecting students of all genders and sexual identities.
- 2014 - present **Member, Instructionally Related Activities (IRA) Advisory Board**, SFSU
Review applications for university IRA funds and recommend allocation of awards.
- 2012 **Member, Scholarship Committee**, Department of Biology
Reviewed scholarship applications and selected award recipients.
- 2011 - present **Mentor, NIH Bridges to the Baccalaureate Program and NSF REU Program**, Dept. of Biology
Hosted program participant in the lab during the summer. Trained the student in molecular biology and bacterial genetics protocols.

B. Other Service Activities

- 2015 - 2018 **California State University Program for Education and Research in Biotechnology (CSUPERB)** grant reviewer.
- 2016 - 2017 **Microbial Genetics and Genomics Meeting**, Asilomar Conference Grounds, CA.
Help organize the meeting by compiling list of attendees and presentation titles. Provide information for attendees and answer questions by electronic mail.
- 2011 - present **Northern California American Society for Microbiology** volunteer
Help organize the fall and spring local meetings, each attended by over 100 people.

- 2009 - 2011 **Secretary, Northern California American Society for Microbiology (NCASM)**
NCASM serves over 200 members in the region. The responsibilities of the Secretary are as follows. Keep track of members' list using the NCASM computer database with MS Access. Manage registration for Spring and Fall Meetings: receive registration materials (forms, checks, PayPal) and log information into database. Collect payments for registration fees and forward them to the Treasurer. Recruit volunteers for the meetings to process pre-registration and on-site registration. Receive member dues (paper form, ASM online renewal, PayPal), log information into the database, and forward membership payments to the Treasurer. In addition, elected officers are required to be available for preparing and giving reports on their office at the business meeting held during the spring general meeting. Officers are required to participate in NCASM Board meetings held 2-3 times per year. The term of the elected office is two years.
- 2008 - 2009 **Northern California American Society for Microbiology** Program Planning Committee
Organized a session for the semi-annual meetings of the local ASM branch.