

JAMES KENNETH CHEN

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EDUCATION

Harvard College , Cambridge, MA	1987 – 1991
A. B. degree in Chemistry, <i>Summa cum laude</i> Research Advisor: George M. Whitesides	
Harvard University , Cambridge, MA	1991 – 1998
Ph.D. degree in Chemistry and Chemical Biology Research Advisor: Stuart L. Schreiber	
Marine Biological Laboratory , Woods Hole, MA	Summer 1998
<i>Embryology: Concepts and Techniques in Modern Developmental Biology</i>	
Johns Hopkins School of Medicine , Baltimore, MD	1999 – 2003
Postdoctoral Fellow, Department of Molecular Biology and Genetics Research Advisor: Philip A. Beachy	

PROFESSIONAL EXPERIENCE

Assistant Professor , Departments of Molecular Pharmacology and (by courtesy) Chemistry, Stanford University, Stanford, CA	2003 – 2006
Assistant Professor , Departments of Chemical and Systems Biology and (by courtesy) Chemistry, Stanford University, Stanford, CA	2006 – 2010
Associate Professor , Departments of Chemical and Systems Biology and (by courtesy) Chemistry, Stanford University, Stanford, CA	2010 – 2016
Associate Professor , Department of Developmental Biology, Stanford University Stanford, CA	2012 – 2016
Professor , Departments of Developmental Biology and (by courtesy) Chemistry, Stanford University, Stanford, CA	2016 – present
Professor and Chair , Department of Chemical and Systems Biology, Stanford University, Stanford, CA	2016 – present

HONORS AND AWARDS

Harvard University Certification of Distinction in Teaching	1991
National Science Foundation Predoctoral Fellowship	1991 – 1994
American Chemical Society Organic Chemistry Predoctoral Fellowship	1994 – 1995
Damon Runyon-Walter Winchell Postdoctoral Fellowship	1999 – 2002
American Cancer Society Postdoctoral Fellowship	2002 – 2003
W. Barry Wood, Jr. Research Award, Johns Hopkins School of Medicine	2003
Kimmel Scholar Award, Sidney Kimmel Foundation for Cancer Research	2004 – 2006
Basil O'Connor Starter Scholar Research Award, March of Dimes Foundation	2005 – 2007
Terman Fellow, Stanford University	2005 – 2008
Astellas USA Foundation Award	2005
Faculty Fellow, Stanford School of Medicine	2006
Brain Tumor Society/Rachel Molly Markoff Research Chair	2006 – 2008
American Cancer Society Research Scholar Award	2008 – 2011
NIH Director's Pioneer Award	2008 – 2013

Nature SciCafe Award for Outstanding Research Achievement	2009
Alex's Lemonade Stand Foundation Innovation Award	2013 – 2015
Transformative Innovation in Basic Bioscience Award, Stanford University	2013
NSF INSPIRE Award	2013 – 2017

PROFESSIONAL SERVICE AND MEMBERSHIPS (STANFORD UNIVERSITY)

Institute Memberships

Associate Member , Stanford Institute for Stem Cell Biology and Regenerative Medicine	2003 – present
Member , Bio-X, Stanford University	2003 – present
Member , Stanford Cancer Institute	2005 – present
Associate Member , Stanford Digestive Disease Center	2009 – 2012
Fellow , Stanford ChEM-H Institute	2013 – present
Member , Child Health Research Institute	2013 – present
Member , Stanford Neurosciences Institute	2017 – present

Graduate Education and Training

Member , Quantitative Chemical Biology Program Steering Committee, Stanford School of Medicine	2004 – 2009
Member , Medical Scientist Training Program Admissions Committee, Stanford School of Medicine	2004 – present
Member , Advisory Committee for the Scholarly Concentrations Program in the Molecular Basis of Medicine, Stanford School of Medicine	2006 – present
Director , Advisory Committee for the Scholarly Concentrations Program in the Molecular Basis of Medicine, Stanford School of Medicine	2011 – present
Faculty Mentor , Stanford Clinical and Translational Networking Program	2010
Departmental Representative , Stanford Biosciences Committee on Graduate Admissions and Policy	2012 – 2014
Advisor , Stanford Biosciences Grant Writing Academy	2014

Administrative Activities

Faculty Director , High-Throughput Bioscience Center, Stanford University, Stanford, CA	2003 – present
Member , Stanford School of Medicine Faculty Diversity Committee	2004 – 2005
Departmental Representative , Stanford School of Medicine Faculty Senate	2005 – 2006
	2009 – 2016
Steering Committee Member , Stanford School of Medicine Faculty Senate	2012 – 2016
Executive Committee Member , Stanford School of Medicine Faculty Senate	2014 – 2016
Alternate Member , Stanford Administrative Panel on Laboratory Animal Care	2012 – 2014
Co-Organizer , Stanford Chemical Biology Symposium	2012 – 2014
Executive Committee Member , Stanford ChEM-H Institute	2013 – present
Member, Radiation Oncology Faculty Search Committee , Stanford School of Medicine	2013
Chair, Junior Faculty Search Committee , Stanford ChEM-H Institute	2013
Co-Chair, Junior Faculty Search Committee , Stanford ChEM-H Institute	2015
Member, Pediatric Chair Search Committee , Stanford School of Medicine	2015

PROFESSIONAL SERVICE AND MEMBERSHIPS (NATIONAL AND INTERNATIONAL)

Society Memberships

Member , American Chemical Society	1989 – present
Member , Society for Developmental Biology	2009 – present

Member , International Zebrafish Society	2016 – present
<u>Editorial Board Memberships</u>	
Editorial Board Member , <i>Zebrafish</i>	2008 – present
Editorial Board Member , <i>Cell Chemical Biology</i>	2009 – present
<u>Industrial Activities</u>	
Consultant , Infinity Pharmaceuticals	2004
Consultant , Fate Therapeutics	2008 – 2011
Scientific Advisor Board Member , Vibliome Therapeutics	2017 – present
<u>Peer-Review Activities</u>	
Reviewer , NIH Study Section (Innovative Technologies for the Molecular Analysis of Cancer)	2005 – 2006
Reviewer , Wellcome Trust/DBT India Alliance Early Career Fellowships	2009
Reviewer , NIH Special Emphasis Panel (ZRG1 BDA-A 52R: hESC Challenge Grant)	2009
Reviewer , NIH Study Section (PAR-08-138: Zebrafish Screens)	2010
Reviewer , NIH Study Section (PAR-08-139: Tools for Zebrafish Research)	2010
Member , NIH Development-1 Study Section (DEV1)	2010 – 2012
Reviewer , ChemThem Chemical Biology	2011
Reviewer , NSF CAREER Award	2011, 2013 – 2015
Reviewer , NIH Study Section (PAR-11-221 and PAR-13-305: Collaborative Interdisciplinary Team Science in NIDDK Research Areas)	2013 – 2014
Reviewer , American Institute for Cancer Research	2013
Reviewer , NIH Special Emphasis Panel (PA-11-184: T32 NRSA Institutional Research Training Grants and PA-14-044: K01 Mentored Research Scientist Development Award)	2015
Reviewer , NIH Synthetic and Biology Chemistry B Study Section (SBCB)	2015
Reviewer , NIH Special Emphasis Panel (ZRG1 BCMB-A 51R: NIH Transformative Research Awards)	2018
Manuscript Reviewer , <i>Accounts of Chemical Research</i> , <i>ACS Chemical Biology</i> , <i>ACS Medicinal Chemistry Letters</i> , <i>Angewandte Chemie</i> , <i>Bioorganic Medicinal Chemistry</i> , <i>Bioorganic Medicinal Chemistry Letters</i> , <i>Chem</i> , <i>Chemical Science</i> , <i>Clinical Cancer Research</i> , <i>Cancer Research</i> , <i>Cell</i> , <i>Cell Chemical Biology</i> , <i>Chembiochem</i> , <i>Chemical Reviews</i> , <i>Development</i> , <i>Developmental Biology</i> , <i>Disease Models and Mechanisms</i> , <i>eLife</i> , <i>Journal of the American Chemical Society</i> , <i>Journal of Cell Science</i> , <i>Journal of Medicinal Chemistry</i> , <i>Journal of Organic Chemistry</i> , <i>Molecular Cancer Research</i> , <i>Nature</i> , <i>Nature Chemical Biology</i> , <i>Nature Communications</i> , <i>Nature Structural and Molecular Biology</i> , <i>PLoS Biology</i> , <i>PLoS Genetics</i> , <i>PLoS ONE</i> , <i>Proceedings of the National Academy of Sciences U. S. A.</i> , <i>Science</i> , <i>Science Translational Medicine</i>	
<u>Other Professional Service</u>	
Discussion Leader , Bioorganic Gordon Research Conference	2007
Workshop Co-Chair , 8 th International Conference on Zebrafish Development and Genetics	2008
Research Committee Member , American Heart Association, Western States Affiliate	2012 – 2016
Co-Instructor , Introduction to Chemical Biology Short Course, University of São Paulo, São Paulo, Brazil	2012, 2014, 2015
Co-Editor , Molecular imaging section in <i>Current Opinion in Chemical Biology</i>	2013
Panelist , NIH Workshop (From Tank to Bedside: Zebrafish and Translational Research)	2013
Panelist , Chemical Biology Workshop, 7 th Strategic Conference of Zebrafish Investigators	2017
Co-Organizer , 2017 Society for Development Biology West Coast Meeting	2017

PUBLICATIONS (PEER-REVIEWED)

1. Chu, Y.-H., **Chen, J. K.**, and Whitesides, G. M. (1993) Affinity electrophoresis in multisectional polyacrylamide slab gels is a useful and convenient technique for measuring binding constants of aryl sulfonamides to bovine carbonic anhydrase B. *Anal. Chem.* 65: 1314-1322.
2. **Chen, J. K.**, Lane, W. S., Brauer, A. W., Tanaka, A., and Schreiber, S. L. (1993) Biased combinatorial libraries: novel ligands for the SH3 domain of phosphatidylinositol 3-kinase. *J. Am. Chem. Soc.* 115: 12591-12592.
3. Yu, H., **Chen, J. K.**, Feng, S., Dalgarno, D., Brauer, A. W., and Schreiber, S. L. (1994) Structural basis for the binding of proline-rich peptides to SH3 domains. *Cell* 76: 933-945.
4. Gomez, F. A., **Chen, J. K.**, Tanaka, A., Schreiber, S. L., and Whitesides, G. M. (1994) Affinity capillary electrophoresis: insights into the binding of SH3 domains by peptides derived from an SH3-binding protein. *J. Org. Chem.* 59: 2885-2886.
5. **Chen, J. K.** and Schreiber, S. L. (1994) SH3 domain-mediated dimerization of an N-terminal fragment of the phosphatidylinositol 3-kinase p85 subunit. *Bioorg. Med. Chem. Lett.* 4: 1755-1760.
6. Feng, S., **Chen, J. K.**, Yu, H., Simon, J. A., and Schreiber, S. L. (1994) Two binding orientations for peptides to the Src SH3 domain: development of a general model for SH3-ligand interactions. *Science* 266: 1241-1247.
7. Combs, A. P., Kapoor, T. M., Feng, S., **Chen, J. K.**, Daude-Snow, L. F., Schreiber, S. L. (1996) Protein structure-based design of combinatorial libraries: discovery of non-peptide binding elements to the Src SH3 domain. *J. Am. Chem. Soc.* 118: 287-288.
8. Liang, J., **Chen, J. K.**, Schreiber, S. L., and Clardy, J. (1996) Crystal structure of PI3K SH3 domain at 2.0 Å resolution. *J. Mol. Biol.* 257: 632-643.
9. **Chen, J. K.**, Lane, W. S., and Schreiber, S. L. (1999) The identification of myriocin-binding proteins. *Chem. Biol.* 6: 221-235.
10. Taipale, J., **Chen, J. K.**, Cooper, M. K., Wang, B., Mann, R. K., Milenkovic, L., Scott, M. P., and Beachy, P. A. (2000) The effects of oncogenic mutations in Smoothed and Patched can be reversed by cyclopamine. *Nature* 406: 1005-1009.
11. Berman, D. M., Karhadkar, S. S., Hallahan, A. R. Pritchard, J. I., Eberhart, C. G., Watkins, D. N., **Chen, J. K.**, Cooper, M. K., Taipale, J., Olson, J. M., and Beachy, P. A. (2002) Medulloblastoma growth inhibition by Hedgehog pathway blockade. *Science* 297: 1559-1561.
12. **Chen, J. K.**, Taipale, J., Cooper, M. K., and Beachy, P. A. (2002) Inhibition of Hedgehog signaling by direct binding of cyclopamine to Smoothed. *Genes Dev.* 16: 2743-2748.
13. **Chen, J. K.**, Taipale, J., Young, K. E., Maiti, T., and Beachy, P. A. (2002) Small molecule modulation of Smoothed activity. *Proc. Natl. Acad. Sci. U. S. A.* 99: 14071-14076.
14. Chen, W., Ren, X., Nelson, C. D., Barak, L. S., **Chen, J. K.**, Beachy, P. A., de Sauvage, F., and Lefkowitz, R. J. (2004) Activity-dependent internalization of Smoothed mediated by beta-Arrestin 2 and GRK2. *Science* 306: 2257-2260.
15. Sinha, S. and **Chen, J. K.** (2006) Purmorphamine activates the Hedgehog pathway by targeting Smoothed. *Nat. Chem. Biol.* 2: 29-30.
16. Meloni, A. R., Fralish, G. B., Kelly, P., Salahpour, A., **Chen, J. K.**, Wechsler-Reya, R. J., Lefkowitz, R. J. and Caron, M. G. (2006) Smoothed signal transduction is promoted by G-protein coupled receptor kinase 2. *Mol. Cell. Biol.* 26: 7550-7560.
17. Esengil, H., Chang, V., Mich, J. K., and **Chen, J. K.** (2007) Small-molecule regulation of zebrafish gene expression. *Nat. Chem. Biol.* 3: 154-155.
18. Shestopalov, I. A., Sinha, S., and **Chen, J. K.** (2007) Light-controlled gene silencing in zebrafish embryos. *Nat. Chem. Biol.* 3: 650-651.
19. Esengil, H. and **Chen, J. K.** (2008) Gene regulation technologies for zebrafish. *Mol. BioSystems* 4: 300-308.
20. Shestopalov, I. A. and **Chen, J. K.** (2008) Chemical technologies for probing embryonic development. *Chem. Soc. Rev.* 37: 1294-1307.

21. Low, W.-C., Wang, C., Pan, Y., Huang, X.-Y., **Chen, J. K.**, and Wang, B. (2008) The decoupling of Smoothed from G-alpha-i proteins has little effect on Gli3 protein processing and Hedgehog-regulated chick neural tube patterning. *Dev. Biol.* 321: 188-196.
22. Stanton, B. Z., Peng, L. F., Maloof, N., Nakai, K., Wang, X., Herlihy, K. M., Duffner, J. L., Taveras, K. M., Hyman, J. M., Lee, S. W., Koehler, A. N., **Chen, J. K.**, Fox, J. L., Mandinova, A., and Schreiber, S. L. (2009) A small molecule that binds Hedgehog and blocks its signaling in human cells. *Nat. Chem. Biol.* 5: 154-156.
23. Cupido, T., Rack, P. G., Firestone, A. J., Hyman, J. M., Han, K., Sinha, S., Ocasio, C. A., and **Chen, J. K.** (2009) The imidazopyridine derivative JK184 reveals dual roles for microtubules in Hedgehog signaling. *Angew. Chem. Int. Ed.* 48: 2321-2324.
24. Mich, J.K., Blaser, H., Thomas, N. A., Firestone, A. J., Yelon, D., Raz, E., and **Chen, J. K.** (2009) Germ cell migration in zebrafish is cyclopamine-sensitive but Smoothed-independent. *Dev. Biol.* 328:342-354.
25. Yang, H., Xiang, J., Wang, N., Zhao, Y., Hyman, J., Jiang, J., **Chen, J. K.**, Yang, Z., and Lin, S. (2009) Converse conformational control of Smoothed activity by structurally related small molecules. *J. Biol. Chem.* 284: 20876-20884.
26. Hyman, J. M., Firestone, A. J., Heine, V. M., Zhao, Y., Ocasio, C. A., Han, K., Sun, M., Rack, P. G., Sinha, S., Wu, J. J., Solow-Cordero, D. E., Jiang, J., Rowitch, D. H., and **Chen, J. K.** (2009) Small-molecule inhibitors reveal multiple strategies for Hedgehog pathway blockade. *Proc. Natl. Acad. Sci. U. S. A.* 106: 14132-14137.
27. Ouyang, X., Shestopalov, I. A., Sinha, S., Zheng, G., Pitt, C. L. W., Li, W.-H., Olson, A. J., and **Chen, J. K.** (2009) Versatile synthesis and rational design of caged morpholinos. *J. Am. Chem. Soc.* 131: 13255-13269.
28. Firestone, A. J. and **Chen, J. K.** (2010) Controlling destiny through chemistry: Small-molecule regulators of cell fate. *ACS Chem. Biol.* 5: 15-34.
29. Shestopalov, I. A. and **Chen, J. K.** (2010) Oligonucleotide-based tools for studying zebrafish development. *Zebrafish* 7: 31-40.
30. Ouyang, X. and **Chen, J. K.** (2010) Synthetic strategies for studying embryonic development. *Chem. Biol.* 17: 590-606.
31. Clanton, J.A., Shestopalov, I., **Chen, J. K.**, and Gamse, J. T. (2011) Lineage labeling of zebrafish cells with laser uncageable fluorescein dextran. *J. Vis. Exp.* doi: 10.3791/2672
32. Sakata, T. and **Chen, J. K.** (2011) Chemical 'Jekyll and Hyde's: Small-molecule inhibitors of developmental signaling pathways. *Chem. Soc. Rev.* 40: 4318-4331.
33. Park, K.-S., Martelotto, L. G., Peifer, M., Sos, M. L., Karnezis, A. N., Mahjoub, M. R., Bernard, K., Conklin, J., Szczepny, A., Yuan, J., Guo, R., Opsina, B., Falzon, J., Bennett, S., Brown, T. J., Markovic, A., Devereux, W. L., Ocasio, C. A., **Chen, J. K.**, Stearns, T., Thomas, R. K., Dorsch, M., Buonamici, S., Watkins, D. N., Peacock, C. D., and Sage, J. (2011) A crucial requirement for Hedgehog signalling in small cell lung cancer. *Nature Med.* 17: 1504-1508.
34. Heine, V. M., Griveau, A., Chapin, C., Ballard, P. L., **Chen, J. K.**, and Rowitch, D. H. (2011) Small-molecule Smoothed agonist prevents glucocorticoid-induced neonatal cerebellar injury. *Science Transl. Med.* 3: 105ra104.
35. Hillman, R. T., Feng, B. Y., Ni, J., Woo, W.-M., Milenkovic, L., Hayden Gephart, M. G., Teruel, M. N., Oro, A. E., **Chen, J. K.**, and Scott, M. P. (2011) Neuropilins are positive regulators of Hedgehog signal transduction. *Genes Dev.* 25: 2333-2346.
36. Mich, J.K. and **Chen, J.K.** (2011) Hedgehog and retinoic acid signalling cooperate to promote motoneurogenesis in zebrafish. *Development* 138: 5113-5119.
37. England, S., Batista. M. F., Mich, J. K., **Chen, J. K.**, and Lewis, K. E. (2011) Roles of Hedgehog pathway components and retinoic acid signalling in specifying zebrafish ventral spinal cord neurons. *Development* 138: 5121-5134.
38. Shestopalov, I. A., Pitt, C. L. W., and **Chen, J. K.** (2012) Spatiotemporal resolution of the Ntla transcriptome in axial mesoderm development. *Nat. Chem. Biol.* 8: 270-276.

39. Kuo, A. J., Song, J., Cheung, P., Ishibe-Murakami, S., Yamazoe, S., **Chen, J. K.**, Patel, D. J., and Gozani, O. (2012) ORC1 BAH domain links H4K20me2 to DNA replication licensing and Meier-Gorlin syndrome. *Nature* 484: 115-119.
40. Firestone, A. J., Weinger, J. S., Maldonado, M., Barlan, K., Langston, L. D., O'Donnell, M. D., Gelfand, V. I., Kapoor, T. M.*, and **Chen, J. K.*** (2012) Small-molecule inhibitors of the AAA+ ATPase motor cytoplasmic dynein. *Nature* 484: 125-129.
41. Yamazoe, S., Shestopalov, I. A., Provost, E., Leach, S. D., and **Chen, J. K.** (2012) Cyclic caged morpholinos: Conformationally gated probes of embryonic gene function. *Angew. Chem. Int. Ed.* 51: 6908-6911.
42. Cho, Y. S., Jung, H. J., Soek S. H., Payumo, A. Y., **Chen, J. K.**, and Kwon, H. J. (2013) Functional inhibition of UQCRB suppresses angiogenesis in zebrafish. *Biochem. Biophys. Res. Comm.* 433: 396-400.
43. Liu, X., Kapoor, T. M., **Chen, J. K.**, Huse, M. (2013) Diacylglycerol promotes centrosome polarization in T cells via reciprocal localization of dynein and myosin II. *Proc. Natl. Acad. Sci. U. S. A.* 110: 11976-11981.
44. Yi, J., Wu, X., Chung, A. H., **Chen, J. K.**, Kapoor, T. M., and Hammer, J. A. (2013) Centrosome repositioning in T cells is biphasic and driven by microtubule end-on capture-shrinkage. *J. Cell. Biol.* 202: 779-92.
45. Moore, J. C., Sheppard, S., Shestopalov, I. A., Yamazoe, S., **Chen, J. K.**, and Lawson, N. (2013) Post-translational mechanisms contribute to Etv2 repression during vascular development. *Dev. Biol.* 384: 128-140.
46. Bonger, K. M., Rakhit, R., Payumo, A. Y., **Chen, J. K.**, and Wandless, T. J. (2014) A general method for regulating protein stability with light. *ACS Chem. Biol.* 9: 111-115.
47. Sikirzhitski, V., Magidson, V., Steinman, J, He, J., LeBerre, M., Tikhonenko, I., Ault, J. G., McEwen, B. F., **Chen, J. K.**, Sui, H., Piel, M., Kapoor, T. M., and Khodjakov, A. (2014) Direct kinetochore-spindle pole connections are not required for chromosome segregation. *J. Cell Biol.* 206: 231-243.
48. Mich, J. K., Payumo, A. Y., Rack, P. G., and **Chen, J. K.** (2014) In vivo imaging of Hedgehog pathway activation with a nuclear fluorescent reporter. *PLoS One* 9:e103661.
49. Lee, J. J., Perera, R. M., Wang, H., Wu, D.-C., Liu, X. S., Han, S., Fitamant, J., Jones, P. D., Ghanta, K. S., Kawano, S., Nagle, J. M., Deshpande, V., Boucher, Y., Kato, T., Chen, J. K., Willmann, J. K., Bardeesy, N., and Beachy, P. A. (2014) Stromal response to Hedgehog signaling restrains pancreatic cancer progression. *Proc. Natl. Acad. Sci. U. S. A.* 111: E3091-E3100.
50. Rack, P. G., Ni, J., Payumo, A. Y., Nguyen, V., Crapster, J. A., Novestadt, V., Kool, M., Jones, D. T. W., Mich, J. K., Firestone, A. J., Pfister, S. M., Cho, Y.-J., and **Chen, J. K.** (2014) Arhgap36-dependent activation of Gli transcription factors. *Proc. Natl. Acad. Sci. U. S. A.* 111: 11061-11066.
51. Yamazoe, S., Liu, Q., McQuade, L. E., Deiters, A.*, and **Chen, J. K.*** (2014) Sequential gene silencing using wavelength-selective caged morpholinos. *Angew. Chem. Int. Ed.* 53: 10114-10118.
52. Yamazoe, S., McQuade, L. E., and **Chen, J. K.** (2014) Nitroreductase-activated caged morpholino oligonucleotides for in vivo gene silencing. *ACS Chem. Biol.* 9: 1985-1990.
53. Payumo, A. Y., Walker, W. J., McQuade, L. E., Yamazoe, S., and **Chen, J. K.** (2015) Optochemical dissection of T-box gene-dependent medial floor plate development. *ACS Chem. Biol.* 10: 1466-75.
54. See, S. K., Hoogendoorn, S., Chung, A. H., Ye, F., Steinman, J. B., Sakata-Kato, T., Miller, R. M., Cupido, T., Zalyte, R., Carter, A. P., Nachury, M. V., Kapoor, T. M., and **Chen, J. K.** (2016) Cytoplasmic dynein antagonists with improved potency and isoform selectivity. *ACS Chem. Biol.* 11: 53-60.
55. **Chen, J. K.** (2016) I only have eye for ewe: the discovery of cyclopamine and development of Hedgehog pathway-targeting drugs. *Nat. Prod. Rep.* 33: 595-601.
56. Payumo, A. Y., McQuade, L. E., Walker, W. J., Yamazoe, S., and **Chen, J. K.** (2016) Tbx16 regulates *hox* gene activation in mesodermal progenitor cells. *Nat. Chem. Biol.* 12: 694-701.
57. Schmitt, A. M., Garcia, J. T., Hung, T., Flynn, R. A., Shen, Y., Qu, K., Payumo, A. Y., Peres-da-Silva, A., Kenzelmann Broz, D., Baum, R., Guo, S., **Chen, J. K.**, Attardi, L. D., and Chang, H. Y.

- (2016) An inducible long noncoding RNA amplifies DNA damage signaling. *Nat. Genet.* 48: 1370-1376.
58. Lee, J., Rothenberg, M., Seeley, E. S., Zimdahl, B., Kawano, S., Lu, W. J., Shin, K., Sakata-Kato, T., **Chen, J. K.**, Diehn, M., Clarke, M., and Beachy, P. A. (2016) Control of inflammation by stromal Hedgehog pathway activation restrains colitis. *Proc. Natl. Acad. Sci. U. S. A.* 113: E7545-E7553.
59. Ouyang, X., Panetta, N. J., Talbott, M. D., Payumo, A. Y., Halluin, C., Longaker, M. T., and **Chen, J. K.** (2017) Hyaluronic acid synthesis is required for zebrafish tail fin regeneration. *PLoS ONE* 12: e0171898.
60. Wong, W. T., Tian, X., Matrone, G., Tomoiaga, S. A., Au, K. F., Meng, S., Yamazoe, S., Chen, K., Burns, D. M., **Chen, J. K.**, Blau, H. M., and Cooke, J. P. (2017) Discovery of novel determinants of endothelial lineage using chimeric heterokaryons. *eLife* 6: e323588.
61. Kowalik, L. and **Chen, J. K.** (2017) Illuminating developmental biology through photochemistry. *Nat. Chem. Biol.* 13: 587-598.
62. Steinman, J. B., Santarossa, C. C., Miller, R. M., Yu, L. S., Serpinskaya, A. S., Furukawa, H., Morimoto S., Tanaka, Y., Nishitani, M., Asano, M., Zalyte, R., Ondrus, A. E., Johnson, A. G., Fan Y., Nachury M. V., Fukase, Y., Aso, K., Foley, M. A., Gelfand, V. I., **Chen, J. K.**, Carter, A. P. and Kapoor, T. M. (2017) Chemical structure-guided design of dynapyrazoles, cell-permeable dynein inhibitors with a unique mode of action. *eLife* 6:e25174.
63. Crapster, J. A., Hudgins L., **Chen, J. K.**, and Gomez-Ospina, N. (2017) A novel missense variant of the GLI3 zinc finger domain in a family with digital anomalies. *Am. J. Med. Genet. A.* 173: 3221-3225.
64. Cho, U., Riordan, D. P., Ciepla, P., Kocherlakota, K. S., **Chen, J. K.***, and Harbury, P. B.* (2018) Ultrasensitive optical imaging with lanthanide lumiphores. *Nat. Chem. Biol.* 14: 15-21.
65. Breslow, D. K.*, Hoogendoorn, S., Kopp, A. R., Morgens, D. W., Vu, B. K., Han, K., Li, A., Hess, G. T., Bassik, M C., **Chen, J. K.***, and Nachury, M. V.* (2018) A CRISPR-based screen for Hedgehog signaling provides insights into ciliary function and ciliopathies. *Nat. Genet.*, Epub ahead of print (preprint available at *bioRxiv* 10.1101/156059).
66. Gutzman, J. H., Graeden, E., Brachmann, I., Yamazoe, S., **Chen, J. K.**, and Sive, H. (2018) Basal constriction during midbrain-hindbrain boundary morphogenesis is mediated by Wnt5b and Focal Adhesion Kinase. Submitted (preprint available at *bioRxiv* 10.1101/251132).

PUBLICATIONS (NON-PEER-REVIEWED)

67. Prime, K. L., Chu, Y.-H., Schmid, W., Seto, C. T., **Chen, J. K.**, Spaltenstein, A., Zerkowski, J., and Whitesides, G. M. (1992) Molecular recognition in gels, monolayers, and solids. In "Macromolecular Assemblies in Polymeric Systems" (P. Stroeve and A. C. Balazs, Eds). ACS Symposium Series 493. American Chemical Society, Washington, DC, pp. 228-239.
68. **Chen, J. K.** and Schreiber, S. L. (1995) Combinatorial synthesis and multidimensional NMR: an approach to understanding protein-ligand interactions. *Angew. Chem. Int. Ed. Engl.* 34: 953-969.
69. **Chen, J.K.** (2008) Fish 'n clicks. *Nat. Chem. Biol.* 4: 391-392.
70. **Chen, J.K.** and Hurlstone, A. F. (2008) Targeted and conditional gene expression workshop, 8th International Conference on Zebrafish Development and Genetics. *Zebrafish* 5: 193-195.
71. Firestone, A. J. and **Chen, J. K.** (2011) Small-molecule inhibitors of the Hedgehog pathway. In "Hedgehog signaling activation in human cancer and its clinical applications" (J. Xie, Ed.) Springer, New York, NY, pp. 163-186.
72. Shestopalov, I. A. and **Chen, J. K.** (2011) Spatiotemporal control of embryonic gene expression using caged morpholinos. In "The Zebrafish: Genetics, Genomics, and Informatics, 3rd Edition" (H. W. Detrich, M. Westerfield, and L. I. Zon, Eds.) Methods in Cell Biology Series, Elsevier Academic Press, San Diego, CA, pp. 151-172.
73. **Chen, J. K.** and Kikuchi, K. (2013) Emerging technologies in molecular imaging: new windows into biology. *Curr. Opin. Chem. Biol.* 17: 635-636.

74. **Chen, J. K.**, Du Bois, J., Glenn, J., Herschlag, D., and Khosla, C. (2013). The Stanford Institute for Chemical Biology. *ACS Chem. Biol.* 8: 1860-1861.
75. Mruk, K. and **Chen, J. K.** (2015) Thinking big with small molecules. *J. Cell Biol.* 209: 7-9.

INVITED LECTURES

1. Symposium on Drug Discovery through Chemical Genomics, Reverse Proteomics Research Institute (Tokyo, Japan). September 30, 2003.
2. Exploratory Research Laboratories, Fujisawa Pharmaceuticals Co., Ltd. (Tsukuba City, Japan). October 1, 2003.
3. Developmental Biology Seminar Series, Center for Developmental Biology, RIKEN (Kobe, Japan). October 3, 2003.
4. Organic Chemistry Seminar, Department of Chemistry, Stanford University (Stanford, CA). October 15, 2003.
5. Cardiovascular Research Center Seminar Series, Massachusetts General Hospital (Charlestown, MA). November 25, 2003.
6. Beyond Genome 2005 Conference: Future of Medicine (San Francisco, CA). June 16, 2005.
7. 1st Annual Strategic Conference of Zebrafish Investigators (Mount Desert Island Biological Laboratory, Salisbury Cove, ME), September 17, 2005.
8. Pacifichem 2005 Congress (Honolulu, HI). December 16, 2005.
9. Discovery on Target 2006 Conference: Chemogenomics (Boston, MA). October 24, 2006.
10. 2nd Annual Strategic Conference of Zebrafish Investigators (Asilomar, CA). February 3, 2007.
11. China-USA Early Career Workshop on Chemical Biology (Shanghai, China). May 22, 2007.
12. Bio-organic Gordon Conference (Andover, NH). June 11, 2007.
13. Chemistry and Biochemistry Seminar Series, Department of Chemistry and Biochemistry, University of Delaware (Newark, DE). February 13, 2008.
14. Biochemistry and Molecular Biology Seminar Series, Department of Biochemistry and Molecular Biology, Mayo Clinic (Rochester, MN). March 4, 2008.
15. Medicinal Chemistry Seminar Series, Department of Medicinal Chemistry, University of Michigan (Ann Arbor, MI). March 13, 2008.
16. Pharmacology and Molecular Sciences Seminar Series, Department of Pharmacology and Molecular Sciences, Johns Hopkins University School of Medicine (Baltimore, MD). March 19, 2008.
17. Hedgehog Signaling in Development and Disease, Stanford School of Medicine (Stanford, CA). June 22, 2008.
18. 8th International Conference on Zebrafish Development and Genetics, University of Wisconsin-Madison (Madison, WI). June 26, 2008.
19. Neuroscience Consortium Cutting Edge Seminar, National Institute on Drug Abuse, National Institutes of Health (Bethesda, MD). August 14, 2008.
20. "Chemical probes of embryonic signaling and patterning." Department of Biology Seminar Series, Department of Biology, Indiana University (Bloomington, IN). October 2, 2008.
21. Technogeek Seminar Series, Division of Translational Research, University of Texas-Southwestern Medical Center (Dallas, TX). November 4, 2008.
22. 2008 RIKEN Conference on Chemical Biology (Narita, Japan). November 13, 2008.
23. Gene Inactivation Workshop, 3rd Annual Strategic Conference of Zebrafish Investigators (Asilomar, CA). January 27, 2009.
24. Chemical Biology Seminar Series, Department of Chemistry, University of Illinois at Urbana-Champaign (Urbana, IL). February 5, 2009.
25. MCDB Seminar Series, Department of Molecular, Cell, and Developmental Biology, University of California-Los Angeles (Los Angeles, CA). February 26, 2009.
26. Lectures in the Chemical Sciences, Organic Chemistry Seminar, Department of Chemistry and Chemical Biology, Harvard University (Cambridge, MA). March 10, 2009.

27. Biophysics/Chemistry and Chemical Biology Seminar Series, University of California-San Francisco (San Francisco, CA). March 20, 2009.
28. 237th American Chemical Society National Meeting (Salt Lake City, UT). March 25, 2009.
29. MCDB Seminar Series, Department of Molecular, Cellular, and Developmental Biology, Yale University (New Haven, CT). April 8, 2009.
30. 100th Annual American Association for Cancer Research Meeting (Denver, CO). April 18, 2009.
31. San Francisco Nature SciCafe, Gladstone Institute, University of California-San Francisco (San Francisco, CA). April 24, 2009.
32. Chemical Biology Seminar Series, Rockefeller University (New York City, NY). May 6, 2009.
33. Genentech (South San Francisco, CA). June 16, 2009.
34. Exelixis (South San Francisco, CA). June 26, 2009.
35. 6th European Zebrafish Genetics and Development Meeting (Rome, Italy). July 17, 2009.
36. Pfizer (La Jolla, CA). July 29, 2009.
37. 10th International Conference on Systems Biology, Stanford University (Stanford, CA). September 1, 2009.
38. Center for Biosciences Seminar, Karolinska Institutet (Stockholm, Sweden). October 6, 2009.
39. Genes and Development Seminar Series, National Institute for Medical Research-Mill Hill (London, United Kingdom). October 8, 2009.
40. Molecular Biology and Biochemistry Seminar Series, University of California-Irvine (Irvine, CA). February 26, 2010.
41. 239th American Chemical Society National Meeting (San Francisco, CA). March 22, 2010.
42. 9th International Conference on Zebrafish Development and Genetics, University of Wisconsin-Madison (Madison, WI). June 17, 2010.
43. 2nd Biennial 'Chemical Insights into Biological Processes' Symposium, Molecular Discovery Program/National Cancer Institute, Hood College (Frederick, MD). August 10, 2010.
44. 2010 YBRI International Symposium, Yonsei University (Seoul, South Korea). October 20, 2010.
45. Organic Seminar Series, University of Colorado-Boulder (Boulder, CO). October 25, 2010.
46. Biochemistry and Molecular Biophysics Seminar Series, Columbia University Medical Center (New York City, NY). November 18, 2010.
47. New Frontiers of Functional Nucleic Acids: Chemistry, Biology, and Applications, Pacificchem 2010 (Honolulu, HI). December 19, 2010.
48. Technology Blast Session, 4th Annual Strategic Conference of Zebrafish Investigators (Asilomar, CA). January 30, 2011.
49. Organic Seminar Series, Colorado State University (Fort Collins, CO). February 21, 2011.
50. ACS Chemical Biology Lecture: Symposium in honor of Stuart L. Schreiber, 241st American Chemical Society National Meeting (Anaheim, CA). March 29, 2011.
51. Biochemistry Colloquium. University of Wisconsin-Madison (Madison, WI). April 11, 2011.
52. Gladstone Institute of Cardiovascular Disease/Cardiovascular Research Institute Seminar Series, University of California-San Francisco (San Francisco, CA). April 18, 2011.
53. Biochemistry and Molecular Pharmacology Seminar Series, University of Massachusetts-Worcester (Worcester, MA). May 4, 2011.
54. 14th Yale Chemical Biology Symposium. Yale University (New Haven, CT). May 13, 2011.
55. Gradient Sensing and Cell Migration Gordon Conference. (Les Diablerets, Switzerland). June 9, 2011.
56. Development and Aging Seminar Series, Burnham Medical Research Institute (La Jolla, CA). July 14, 2011.
57. A New Wave of Chemical Genomics Symposium, Kinki University (Osaka, Japan). September 24, 2011.
58. 11th iCeMS International Symposium: Chemical Control of Cells, Kyoto University (Kyoto, Japan). December 6, 2011.
59. Addressing the Challenges of Drug Discovery—Novel Targets, New Chemical Space, and Emerging Approaches. Keystone Symposium (Tahoe City, CA). March 20, 2012.

60. American Association for Cancer Research Special Conference on Chemical Systems Biology (Boston, MA). June 30, 2012.
61. EMBO Workshop on Single Cell Physiology. École Normale Supérieure (Paris, France). July 25, 2012.
62. Vanderbilt Institute of Chemical Biology Annual Student Symposium, Vanderbilt University (Nashville, TN). August 9, 2012.
63. Cell Biology Seminar Series, University of Georgia (Athens, GA). October 16, 2012.
64. Chemistry Seminar Series, North Carolina State University (Raleigh, NC). November 2, 2012.
65. Brazilian Biosciences National Laboratory (Campinas, Brazil). November 26, 2012.
66. Department of Biochemistry, University of São Paulo (São Paulo, Brazil). November 30, 2012.
67. Chemical Biology Seminar Series, Princeton University (Princeton, NJ). March 20, 2013.
68. Cutting Symposium: SPARK at Stanford, Stanford University (Stanford, CA). March 27, 2013.
69. Chemistry Colloquium Series, Brown University (Providence, RI). April 25, 2013.
70. Institute of Chemical Sciences and Engineering, École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland). July 15, 2013.
71. Scripps-Florida (Jupiter, FL). November 7, 2013.
72. Pharmacology Seminar Series, University of Texas-Southwestern Medical Center (Dallas, TX). December 13, 2013.
73. Medulloblastoma in the Mountains 2 (St. Moritz, Switzerland). January 14, 2014.
74. Society for Laboratory Automation and Screening 2014 Conference (San Diego, CA). January 21, 2014.
75. Sanford-Burnham Medical Research Institute (La Jolla, CA). March 17, 2014.
76. Pharmaceutical Sciences and Pharmacogenomics Seminar Series, University of California-San Francisco (San Francisco, CA). April 8, 2014.
77. Brazilian Biosciences National Laboratory (Campinas, Brazil). May 22, 2014.
78. Federal University of Rio Grande do Norte (Natal, Brazil). May 23, 2014.
79. Hedgehog 2014 Meeting (Ann Arbor, MI). August 6, 2014.
80. Department of Biochemistry, University of São Paulo (São Paulo, Brazil). October 9, 2014.
81. Institute for Biophysical Dynamics Interdisciplinary Research Seminar Series, University of Chicago (Chicago, IL). November 4, 2014.
82. 6th Strategic Conference of Zebrafish Investigators (Asilomar Conference Center, Pacific Grove, CA), January 19, 2015.
83. Medulloblastoma in the Mountains 3 (Lake Tahoe, CA). February 9, 2015.
84. Society for Developmental Biology West Coast Meeting (Fish Camp, CA). March 25, 2015.
85. 9th European Zebrafish Meeting (Oslo, Norway). June 30, 2015.
86. 2nd Zebrafish for Personalized/Precision Medicine Conference (Toronto, Canada). September 25, 2015.
87. Introduction to Chemical Biology Workshop, University of São Paulo (São Paulo, Brazil). October 2, 2015.
88. In Vivo Chemical Strategies for Functional and Translational Studies of Biological Networks and Pathways, Pacificchem 2015 (Honolulu, HI). December 19, 2015.
89. Medulloblastoma in the Mountains 4 (Waterville Valley, NH). January 25, 2016.
90. Academic Drug Discovery 2016 (Cambridge, UK). March 22, 2016.
91. Chemistry Colloquia, University of Pittsburgh (Pittsburgh, PA). September 29, 2016.
92. Medulloblastoma in the Mountains 5 (Steamboat Springs, CO). January 24, 2017.
93. Chemical Tools for Complex Biological Systems, HHMI/Janelia (Ashburn, VA). April 25, 2017.
94. Developmental and Cell Biology Seminar Series, University of California-Irvine (Irvine, CA). November 9, 2017.
95. Molecular and Cell Biology Seminar Series, University of California-Merced (Merced, CA). December 5, 2017.
96. Medulloblastoma in the Mountains 6 (Pra Loup, France). January 23, 2018.
97. Organic Chemistry Seminar Series, Caltech (Pasadena, CA). February 21, 2018.

98. Organic Chemistry Seminar Series, University of Washington (Seattle, WA). March 29, 2018.

PATENTS

1. Beachy, P. A., **Chen, J. K.**, and Taipale, A. J. N. Regulators of the Hedgehog pathway, compositions and uses related thereto. U.S. Patent 7,098,196. August 29, 2006.
2. Beachy, P. A., **Chen, J. K.**, and Taipale, A. J. N. Regulators of the Hedgehog pathway, compositions and uses related thereto. U.S. Patent 7,476,661. January 13, 2009.
3. Beachy, P. A., **Chen, J. K.**, and Taipale, A. J. N. Modulators of the Hedgehog signaling pathway, compositions and uses related thereto. U.S. Patent 7,655,674. February 2, 2010.
4. **Chen, J. K.**, Kato, T. S. and Ondrus, A. E. Imidazo bicyclic iminium compounds as antitumor agents. U.S. Patent 9,611,276. April 4, 2017.

TEACHING

Cancer Biology 280

Journal club

Fall 2003
Spring 2011
Fall 2015

Chemical and Systems Biology 210/Molecular Pharmacology 210

Cell signaling (formerly Signaling networks and pathways)

Winter 2006
Winter 2007
Winter 2009
Winter 2010
Winter 2012
Winter 2013
Winter 2014
Winter 2015
Winter 2016
Winter 2017

Chemical and Systems Biology 220/Molecular Pharmacology 220

The chemistry of biological processes

Fall 2004
Fall 2005
Fall 2007
Spring 2009
Spring 2015

Chemical and Systems Biology 260/Molecular Pharmacology 260

Concepts and applications in chemical biology (formerly Quantitative chemical biology)

Spring 2006
Spring 2008
Spring 2010
Spring 2012
Spring 2014
Spring 2016

Chemistry 111

Exploring chemical research at Stanford

Winter 2006

Developmental Biology 210

Logic and circuitry of multicellular development

Spring 2014
Spring 2015
Spring 2017

Medicine 217 Medico-technological frontiers of digestive diseases	Spring 2004 Spring 2005 Spring 2006
Microbiology and Immunology 215 Principles of biological technologies	Spring 2014 Spring 2015
Molecular Pharmacology 240 Drug discovery	Spring 2005
Molecular Pharmacology 270 Research seminar	Fall 2003 Fall 2004
Pathology 290 Pediatric non-malignant hematology and stem cell biology	Winter 2015
Surgery 690 It's all in the head: understanding diversity, development and deformities of the face	Winter 2007 Winter 2008

FUNDING (ACTIVE)

P50 GM107615 NIH/NIGMS "Systems biology of collective cell decisions" Role: co-I (PI: Ferrell, J. E.)	09/2013 – 06/2018
R01 GM108952 NIH/NIGMS "Development of lariat-shaped caged morpholinos for optochemical gene regulation" Role: PI	08/2014 – 07/2018
R01 GM112728 NIH/NIGMS "Chemically triggered morpholino antisense oligonucleotides" Role: co-I (PI: Deiters, A.)	09/2015– 07/2018
R35 GM127030 NIH/NIGMS "Chemical tools for developmental biology" Role: PI	04/2018 – 03/2023
N/A The Rachel Molly Markoff Foundation "Small-molecule modulators of ARHGAP36, a novel driver of pediatric neural cancers" Role: PI	05/2017 – 04/2018
N/A Male Contraception Initiative "Development of selective HIPK4 kinase inhibitors as viable non-hormonal male contraceptives" Role: co-I (PI: Flynn, G.)	11/2017 – 10/2020

FUNDING (COMPLETED)

Beckman-Ludwig Translational Program in Cancer Research Stanford University "Isolation and characterization of novel Hedgehog antagonists for therapy of gastrointestinal malignancies" Role: co-PI with Kuo, C. J.	01/2004 – 12/2005
OTL Research Incentive Award Stanford University "Constitutive and conditional gene silencing in zebrafish" Role: PI	06/2004 – 08/2006
Kimmel Scholar Award Sidney Kimmel Foundation for Cancer Research "Chemical and genetic studies of the Hedgehog pathway" Role: PI	07/2004 – 06/2006
Basil O'Connor Starter Scholar Research Award March of Dimes Foundation "Photochemical regulation of zebrafish gene expression for embryological studies" Role: PI	02/2005 – 01/2007
R01 GM072600 NIH/NIGMS "Chemical regulation of zebrafish gene expression" Role: PI	07/2005 – 06/2010
Gift Funds to the Stanford High-Throughput Bioscience Center Anonymous Donor "Stanford High-Throughput Bioscience Center" Role: PI	08/2005
Terman Fellow Award Stanford University "Spatiotemporal control of zebrafish gene expression" Role: PI	09/2005 – 08/2008
Astellas USA Foundation Award Astellas USA Foundation Role: PI	11/2005 – 10/2006
Brain Tumor Society Award Brain Tumor Society/Rachel Molly Markoff Foundation "Novel Hedgehog pathway antagonists as potential medulloblastoma therapeutics" Role: PI	09/2006 – 08/2008
RSG-08-041-01-DDC (ACS Research Scholar Award) American Cancer Society "Hedgehog signaling and vertebrate germ cell migration" Role: PI	01/2008 – 12/2012

1-FY-08-433	06/2008 – 05/2012
March of Dimes Foundation	
“No-tail patterning of the zebrafish mesoderm”	
Role: PI	
DP1 HD075622 (NIH Director’s Pioneer Award)	09/2008 – 07/2014
NIH/NICHD	
“Chemical embryology: Technologies for manipulating and visualizing development”	
Role: PI	
R01 CA136574	12/2008 – 11/2014
NIH/NCI	
“Hedgehog pathway blockade by Gli antagonists”	
Role: PI	
R01 GM087292	07/2010 – 06/2015
NIH/NIGMS	
“Deciphering T-box gene-dependent mesoderm development with synthetic probes”	
Role: PI	
R03 MH094195	04/2011 – 03/2013
NIH/NIMH	
“A high-throughput screen for small-molecule antagonists of Gli function”	
Role: PI	
Spectrum Pilot Grant	01/2013 – 12/2013
Stanford SPARK	
“Small-molecule antagonists of cytoplasmic dynein”	
Role: PI	
Innovation Award	07/2013 – 06/2015
Alex’s Lemonade Stand Foundation	
“Next-generation therapies for Hedgehog pathway-dependent tumors”	
Role: PI	
Transformative Innovation in Basic Bioscience Award	08/2013 – 07/2014
Stanford University	
“Optogenetic probe discovery through molecular evolution”	
Role: PI	
Stanford SPARK	06/2014 – 05/2015
“Small-molecule antagonists of cytoplasmic dynein”	
Role: PI	
Stanford Innovation Project Award	11/2014 – 2/2015
“Gli1-selective antagonists”	
Role: PI	
Translational Research Award	04/2014 – 03/2016
Stanford Cancer Institute	
“Gli antagonists for Hedgehog-dependent cancers”	
Role: co-I (PI: Oro, A. E.)	

R21 HD078385 NIH/NICHD “Chemical genetic dissection of Hipk4-dependent Hedgehog pathway activation” Role: PI	09/2014 – 08/2017
CHE-1344038 (NSF INSPIRE Award) NSF “Lanthanide-based probes for visualizing RNAs and proteins in live organisms” Role: PI	10/2013 – 09/2017
R01 GM113100 NIH/NIGMS “Gli1-selective inhibitors of the Hedgehog signaling pathway” Role: PI	07/2015 – 03/2018