

KENICHI SHIMADA

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Ludwig Center and DFCI Breast Oncology Program
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Education

University of Tokyo, Japan, Life Sciences, B.A.	Apr 1999 – Mar 2003
University of Tokyo, Japan, Life Sciences, M.A.	Apr 2003 – Mar 2005
Columbia University, New York, Biological Sciences, Ph.D.	Sep 2006 – May 2015

Professional Experience

Research assistant, HuBit Genomix, Japan	Feb 2006 – Jul 2006
Postdoctoral fellow, Columbia University, New York	Jul 2015 – Oct 2015
Postdoctoral fellow, Harvard Medical School, Boston	Nov 2015 – Nov 2020
Research Associate, Harvard Medical School, Boston	Dec 2020 – Present

Teaching Experience

Teaching assistant for Cell Biology Labs, University of Tokyo	Sep 2002 – Dec 2004
Teaching assistant for Biochemistry, Columbia University	Sep 2007 – Dec 2007
Teaching assistant for Molecular Biology, Columbia University	Jan 2008 – May 2008
Mentoring a summer undergraduate Intern (10 weeks), Harvard Medical School	Jun 2018 – Aug 2018

Fellowships

Japan Society for the Promotion of Science Overseas Research Fellowships Title: "Elucidating intercellular communication during drug-induced cellular injury"	Apr 2017– Mar 2019
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Grants

ROIS-DS-JOINT, Joint Support–Center for Data Science Research, Japan Title: "Elucidating genome-wide epistatic relationship from ortholog coevolution patterns" <i>This grant is given to me for my ongoing collaboration with Dr. H. Chiba (DBCLS, Japan), Dr. G. Dey (UCL), and Dr. T. Meyer (Stanford).</i>	Oct 2017– Mar 2020
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Publications

1. **Shimada K***, Mitchison TJ. ShinyTGGATES: a web tool for comparative toxicogenomics of Open TG-GATEs. *In preparation*. (*corresponding author)
2. Fraser C, Presser A, **Shimada K**, Lopez O, Spetz J, Joshi G, Webster K, Guerriero J, Karst A, Li C, Winter P, Yue Y, Patel L, Deng J, Sorrentino A, Bandyopadhyay S, Goga A, Sorger PK, Mancias J, Wood KC, Hata A, DeCaprio J, Thakuria M, Yoon C, Lossos I, Matulonis U, Stover E, Drapkin R, Kirsch D, Cherniack A, Letai A, Sarosiek K. Broad sensitivity or resistance to cancer therapies is established by apoptotic programming in cells of origin and modulated by oncogenes during transformation. *In preparation*.
3. **Shimada K****, Gregori-Puigjane E, Stokes ME, Skouta R, Stockwell BR. Enforcing cell-based phenotypic screening with polypharmacology to interpret compound mechanisms of action. *In revision*. (**co-corresponding author).
4. Weng JH, Koch PD, Luan HH, Tu HC, **Shimada K**, Ngan I, Ventura R, Jiang R, Mitchison TJ. Colchicine acts selectively in the liver to induce hepatokines that inhibit myeloid cell activation. *Nat Metab*. 2021 Apr;3(4):513-522.
5. **Shimada K***, Bachman JA, Muhlich JL, Mitchison TJ. shinyDepMap, a tool to identify targetable cancer genes and their functional connections from Cancer Dependency Map data. *eLife*. 2021 Feb 8;10:e57116.
(*corresponding author)
Accompanying website: <https://labsyspharm.shinyapps.io/depmap>.
6. Stokes ME, Small JC, Vasciaveo A, **Shimada K**, Cerf TH, Califano A, Stockwell BR. Mesenchymal subtype neuroblastomas are addicted to TGF- β R2/ HMGCR-driven protein geranylgeranylation. *Sci Rep*. 2020 Jul 1;10(1):10748. doi: 10.1038/s41598-020-67310-0.
7. Nakanishi M, Mitchell RR, Benoit YD, Orlando L, Reid JC, **Shimada K**, Davidson KC, Shapovalova Z, Collins JC, Nagy A, Bhatia M. Human *in vitro* pluripotency is initiated and preserved by a unique subset of founder cells. *Cell*. 2019, May 2;177(4):910-924.e22.
8. **Shimada K***, Mitchison TJ. Unsupervised identification of disease states from high dimensional physiological and histopathological profiles. *Molecular Systems Biology*. 2019, 15, e8636 (*corresponding author)
This work was featured in HMS News (<https://hms.harvard.edu/news/toxin-response>).
9. **Shimada K**, Reznik E, Stokes ME, Krishnamoorthy L, Bos PH, Yuyu S, Quartararo CE, Pagano NC, Carpizo DR, deCarvalho AC, Lo DC, Stockwell BR. Copper-binding small molecule induces oxidative stress and cell cycle arrest in glioblastoma-patient-derived cells. *Cell Chem Biol*. 2018, May 17;25(5):585-594.e7.

10. Viswanathan VS, Ryan MJ, Dhruv HD, Gill S, Eichhoff OM, Seashore-Ludlow B, Kaffenberger SD, Eaton JK, **Shimada K**, Aguirre AJ, Viswanathan SR, Chattopadhyay S, Tamayo P, Yang WS, Rees MG, Chen S, Boskovic ZV, Javid S, Huang C, Wu X, Tseng YY, Roider EM, Gao D, Cleary JM, Wolpin BM, Mesirov JP, Haber DA, Engelman JA, Boehm JS, Kotz JD, Hon CS, Chen Y, Hahn WC, Levesque MP, Doench JG, Berens ME, Shamji AF, Clemons PA, Stockwell BR, Schreiber SL. Dependency of a therapy-resistant state of cancer cells on a lipid peroxidase pathway. *Nature*. 2017 Jul 27;547(7664):453-457.
11. **Shimada K**, Skouta R, Kaplan A, Yang WS, Miki H, Dixon SJ, Brown LM, Valenzuela CA, Wolpaw AJ, Stockwell BR. Global survey of cell death mechanisms reveals metabolic regulation of ferroptosis. *Nat Chem Biol*. 2016 Jul;12(7):497-503.
12. **Shimada K**^{**}, Hayano M, Pagano N, Stockwell BR^{**}. Cell-line selectivity improves the predictive power of pharmacogenomic analyses and helps identify NADPH as biomarker for ferroptosis sensitivity. *Cell Chem Biol*. 2016 Feb 18; 23(2):225-235. (**co-corresponding author)
13. **Shimada K**, Stockwell BR. tRNA synthase suppression activates *de novo* cysteine synthesis to compensate for cystine and glutathione deprivation during ferroptosis. Commentary. *Mol Cell Oncol*. 2015 Oct 6;3(2):e1091059.
14. Skouta R, Dixon SJ, Wang J, Dunn DE, Orman M, **Shimada K**, Rosenberg PA, Lo DC, Weinberg JM, Linkermann A, Stockwell BR. Ferrostatins inhibit oxidative lipid damage and cell death in diverse disease models. *J Am Chem Soc*. 2014 Mar 26;136(12):4551-6.
15. Julien O, Kampmann M, Bassik MC, Zorn JA, Venditto VJ, Shimbo K, Agard NJ, **Shimada K**, Rheingold AL, Stockwell BR, Weissman JS, Wells JA. Unraveling the mechanism of cell death induced by chemical fibrils. *Nat Chem Biol*, 2014 Sep 28; 10(11):969-76.
16. Yang W, SriRamaratnam R, Welsch M, **Shimada K**, Skouta R, Viswanathan V, Clish CB, Brown L, Girotti A, Schreiber S, Cornish V, Stockwell BR. GPX4 regulates ferroptotic cell death. *Cell*, 2014 Jan 16;156(1-2):317-31.
17. Skouta R, Hayano M, **Shimada K** and Stockwell BR. Design and synthesis of Pictet-Spengler condensation products that exhibit oncogenic *RAS* synthetic lethality and induce non-apoptotic cell death. *Bioorg Med Chem Lett*, 2012 Sep;22(17):5707-13.
18. Weiwer M, Bittker JA, Lewis TA, **Shimada K**, Yang WS, Macpherson L, Dandapani S, Palmer M, Stockwell BR, Schreiber SL, Munoz B. Development of small-molecule probes that selectively kill cells induced to express mutant *RAS*. *Bioorg Med Chem Lett*, 2012 Feb;22(4):1822-6.
19. Yang W, **Shimada K**, Delva D, Patel M, Ode E, Skouta R, Stockwell BR. Identification of simple compounds with microtubule-binding activity that inhibit cancer cell growth with high potency. *ACS Med Chem Letters*, 2012 Jan;3(1):35-38.

20. Wolpaw AJ, **Shimada K**, Skouta R, Welsch ME, Akavia UD, Pe'er D, Shaik F, Bulinski JC, Stockwell BR. Modulatory Profiling Identifies Mechanisms of small molecule-induced cell death. *Proc Natl Acad Sci USA*, **2011** Sep;108(39):E771-80.
21. Herman AG, Hayano M, Poyurovsky MV, **Shimada K**, Skouta R, Prives C, Stockwell BR. Discovery of Mdm2-MdmX E3 ligase inhibitors using a cell-based ubiquitination assay. *Cancer Discovery*, **2011** Sep;1(4):312-25.
22. Shiozuka M, Wagatsuma A, Kawamoto T, Sasaki H, **Shimada K**, Takahashi Y, Nonomura Y, Matsuda R. Transdermal delivery of a readthrough-inducing drug: a new approach of gentamicin administration for the treatment of nonsense mutation-mediated disorders. *J Biochem*, **2010** Apr;147(4):463-70.

Patents

1. Stockwell BR, Shimada K, Skouta R, Small molecule ferroptosis inducers, 2019. (US20190315681A1)

Skills

Language: Japanese (native), English (fluent)

Molecular biology and biochemistry: high-throughput cell-based screening of chemical and genetic (shRNA and siRNA) libraries, cell culture, flow cytometry, immunofluorescence, microscopy, western blotting, protein purification, mouse physiology (xenograft for drug treatment, liver cell isolation using collagenase perfusion, EDL muscle fiber isolation), antibody creation (mouse monoclonal and rabbit polyclonal)

Computer: Programming languages (R, Bash, Perl, Python), database (MySQL), web development (HTML, Shiny app), machine learning, microarray and RNA-seq data analysis, high-performance computing

Activities

- **Harvard program in Therapeutic Sciences (HiTS) seminar series:** I invite speakers and host the seminars with two postdoc co-organizers (past speakers: <http://hits.harvard.edu/news-events/news-events-archive/>).
- **Boston/Harvard Cell Death Initiative:** I invite speakers engaged in cell death research from Greater Boston Area and host seminars with Dr. Kris Sarosiek of Harvard School of Public Health (past speakers: <https://sites.sph.harvard.edu/cell-death-initiative/>).

Selected Oral and Poster Presentations

1. Poster. Zoological Society of Japan (75th), Kobe, Japan, September 2004
2. Poster. American Society for Cell Biology (44th), Washington D.C., December 2004
3. Poster. New York Cell Death Meeting at Rockefeller University. New York, NY, June 2013
4. Oral and poster. Chemical Biology Discussion Group Year-End Symposium at New York Academy of Sciences, New York, NY, June 2014
5. Oral and poster. Drug Safety, Gordon Research Conference, Easton, MA, June 2016
6. Poster. Harvard Program in Therapeutic Science 2nd Annual Symposium, Boston, MA, December 2016. (3rd place)
7. Oral. Cold Spring Harbor Laboratory Meeting on Cell Death, Cold Spring Harbor, NY, August 2019.
8. Oral. Japanese Biochemical Society (94th), Yokohama, Japan, November 2021 (invited; virtual).
9. Poster. 2021 San Antonio Breast Cancer Symposium, San Antonio, TX, December 2021 (virtual).

Selected Invited Seminars

1. Eisai, Andover, MA. Oct 17, 2016
2. Hokkaido University, Sapporo, Japan. Feb 16, 2017
3. The laboratory of Dr. Masayuki Miura, University of Tokyo, Japan. Feb 10, 2017
4. Eisai Tsukuba Research Laboratories, Tsukuba, Japan. Feb 21, 2017
5. The laboratory of Dr. Sangeeta Bhatia, MIT, Cambridge, MA. Jan 16, 2018
6. Alnylam Pharmaceuticals, Cambridge, MA. Jan 18, 2018
7. GPX4-dependent cell state meeting, the laboratory of Dr. Stuart Schreiber, Broad Institute, Cambridge, MA. Nov 1, 2018
8. Chugai Pharmaceutical, Kamakura, Japan. Jan 17, 2019
9. School of Chinese Medicine, Hong Kong Baptist University, Hong Kong, China. Jan 28, 2019