

SABRINA LEIGH SPENCER

Curriculum Vitae

Department of Biochemistry, University of Colorado-Boulder

sabrina.spencer@colorado.edu

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA June 2009
PhD in Computational and Systems Biology

University of Michigan, Ann Arbor, MI April 2003
MS in Human Genetics

The George Washington University, Washington, DC May 2001
BS in Biology (Honors); BA in French Language & Literature

EMPLOYMENT

University of Colorado – Boulder, Boulder, CO 8/2021 – present
Associate Professor, Department of Biochemistry

Member of the BioFrontiers Institute and University of Colorado Cancer Center
Assistant Professor, Department of Biochemistry 8/2014 – 8/2021

RESEARCH EXPERIENCE

Stanford University, Palo Alto, CA 3/2010 – 8/2014
Damon Runyon Cancer Research Foundation Postdoctoral Fellow and
American Cancer Society Postdoctoral Fellow, Advisor: Dr. Tobias Meyer

Massachusetts Institute of Technology, Cambridge, MA 9/2004 – 12/2009
PhD student, Advisor: Dr. Peter K. Sorger.

The Santa Fe Institute, Santa Fe NM 7/2004 – 8/2004
Steinmetz Fellow, Advisor: Dr. Stephanie Forrest & Dr. David Krakauer.

University of Adelaide, Adelaide Australia 1/2004 – 3/2004
Visiting scholar, Advisor: Dr. Derek Abbott

HONORS AND AWARDS

Mark Foundation for Cancer Research - Emerging Leader Award 2/2021 – 1/2024

Damon Runyon Cancer Research Foundation - Damon Runyon-Rachleff Innovation Award 1/2021 – 12/2022

Provost's Faculty Achievement Award 8/2020

Kavli Fellow, National Academy of Sciences/Kavli Frontiers of Science 2020

NIH Director's New Innovator Award 10/2018 – 9/2023

Maximizing Investigator's Research Award (MIRA), NIH – declined 10/2018

American Cancer Society – Research Scholar Grant 7/2018 – 6/2022

Pew-Stewart Scholar Award 8/2017 – 7/2021

Beckman Young Investigator Award 8/2016 – 7/2020

Searle Scholar Award 7/2016 – 6/2019

Kimmel Scholar Award 7/2016 – 6/2018

Boettcher Foundation Early Career Investigator Award	7/2016 – 6/2019
K22 Career Development Award, National Cancer Institute, NIH	9/2014 – 8/2017
Prize for Best 2013 Publication, Dept of Chemical and Systems Biology, Stanford University	9/2013
American Cancer Society - Robert and Mary Ann Forsland Postdoctoral Fellowship	4/2013 – 8/2014
Damon Runyon Cancer Research Foundation - Postdoctoral Fellowship	3/2010 – 3/2013
Henzl-Gabor Young Women in Science Fellowship, Stanford University	11/2010
Steinmetz Fellowship, Santa Fe Institute	7/2004 – 8/2004
The Queen Elizabeth Hospital Research Foundation Scholarship, Adelaide, Australia	1/2004 – 3/2004
Complex Systems Summer School Scholarship, Santa Fe Institute	6/2003
Phi Beta Kappa	5/2000
Graduated <i>Summa cum laude</i> , The George Washington University	5/2001
Presidential Recognition Award, The George Washington University	9/2000 – 5/2001
Presidential Academic Scholarship, The George Washington University	9/1996 – 5/2001

PUBLICATIONS

*marks co-first authorship; ♦ marks non-peer reviewed work (commentary or review article)

Publications since starting my own lab

15. Khong A, Ripin N, de Vasconcelos LM, **Spencer SL**, Parker R. Stress granules promote chemoresistance by triggering cellular quiescence. *bioRxiv*. <https://doi.org/10.1101/2022.02.22.481503>
14. Macdougall LJ, Hoffman TE, Kirkpatrick BE, Fairbanks BD, Bowman CN, **Spencer SL**, Anseth KS. Intracellular Crowding by Bio-Orthogonal Hydrogel Formation Induces Reversible Molecular Stasis (2022). *Advanced Materials*, 34(31):e2202882.
13. Promislow D, Anderson RM, Scheffer M, Crespi B, DeGregori J, Harris K, Horowitz BN, Levine ME, Riolo MA, Schneider DS, **Spencer SL**, Valenzano DR, Hochberg ME. Resilience Integrates Concepts in Aging Research (2022). *iScience*, 25(5):104199 (♦)
12. Armstrong C and **Spencer SL**. Replication-dependent histone biosynthesis is coupled to cell-cycle entry (2021). *PNAS*, 118(31) e2100178118.
11. Yang C*, Tian C*, Hoffman T*, Jacobsen N, **Spencer SL**. Melanoma subpopulations that rapidly escape MAPK pathway inhibition incur DNA damage and rely on stress signalling (2021). *Nature Communications*, 12(1):1747.
10. Kehrman AQ*, Adikes RC*, Martinez MAQ, Palmisano NJ, Smith JJ, Medwig-Kinney TN, Min M, Sallee MD, Ahmed OB, Kim N, Liu S, Morabito RD, Weeks N, Zhang W, Feldman JL, Barkoulas M, Pani AM, **Spencer SL**, Martin BL, Matus DQ. Visualizing the metazoan proliferation-differentiation decision in vivo (2020). *eLife* 9:e63265.
9. Tian C*, Yang C*, **Spencer SL**. EllipTrack: A Global-Local Cell-Tracking Pipeline for 2D Fluorescence Time-Lapse Microscopy (2020). *Cell Reports*, 32(5):108984.
- Covered in a preLight by Marian De Niz, April 2020.
8. Min M, Rong Y, Tian C, **Spencer SL**. Temporal integration of mitogen history in mother cells controls proliferation of daughter cells (2020). *Science*, 368(6496):1261-1265
7. Ashraf HM, Moser J, **Spencer SL**. Senescence Evasion in Chemotherapy: A Sweet Spot for p21 (2019). *Cell*, 178(2):267-269. (♦)

6. Min M and **Spencer SL**. Spontaneously slow-cycling subpopulations of human cells originate from activation of stress-response pathways (2019). *PLoS Biology*, 17(3):e3000178.
5. Moser J, Miller I, Carter D, **Spencer SL**. Control of the Restriction Point by Rb and p21 (2018). *PNAS*, 115(35):E8219-E8227.
4. Miller I*, Min M*, Yang C, Tian C, Gookin S, Carter D, **Spencer SL**. Ki67 is a graded rather than a binary marker of proliferation vs. quiescence (2018). *Cell Reports*, 24(5):1105-1112.
-Recommended in Faculty of 1000
3. Arora M and **Spencer SL**. A cell-cycle “safe space” for surviving chemotherapy (2017). *Cell Systems*, 5(3):161-162. (♦)
2. Gookin S*, Min M*, Phadke H, Chung M, Moser J, Miller I, Carter, D, **Spencer SL**. A map of protein dynamics during cell-cycle progression and cell-cycle exit (2017). *PLoS Biology*, 15(9):e2003268.
1. Arora M, Moser J, Phadke H, Akbar-Basha A, **Spencer SL**. Endogenous replication stress in mother cells leads to quiescence of daughter cells (2017). *Cell Reports*, 19(7):1351-1364.
- Covered in a News and Views by JE Purvis. (2017) *Nature*, 549:343-344.

Publications from postdoctoral work

4. Cappell SD, Chung M, Jaimovich A, **Spencer SL**, Meyer T (2016). Irreversible APC^{Cdh1} inactivation underlies the point of no return for cell-cycle entry. *Cell*, 166:167-80.
3. Yang Z, Broz DK, Noderer W, Ferreira J, Overton KW, **Spencer SL**, Meyer T, Tapscott S, Attardi L, Wang CL (2015). p53 Suppresses Muscle Differentiation at the Myogenin Step in Response to Genotoxic Stress. *Cell Death and Differentiation*, 22(4):560-73.
2. Overton KW, **Spencer SL**, Noderer WL, Meyer T, Wang CL (2014). Basal p21 controls population heterogeneity in cycling and quiescent cell-cycle states. *PNAS*, 111(41):E4386-93.
1. **Spencer SL**, Cappell, SD, Tsai FC, Overton KW, Wang CL, Meyer T (2013). The proliferation-quiescence decision is controlled by a bifurcation in CDK2 activity at mitotic exit. *Cell*, 155(2):369-83.
- Recommended in Faculty of 1000
- Research Watch by E. McKenna. (2013) *Cancer Discovery*.
- Research Highlight by K. Minton. (2013) *Nature Reviews Molecular Cell Biology*.
- Perspective by T. Zhang. (2013) *Science Signaling*.

Publications from PhD work

7. Flusberg D, Roux J, **Spencer SL**, Sorger PK (2013). Cells surviving fractional killing by TRAIL exhibit transient but sustainable resistance and inflammatory phenotypes. *Molecular Biology of the Cell*, 24(14):2186-200.
6. Gaudet S*, **Spencer SL***, Chen W, Sorger PK (2012). Exploring the contextual sensitivity of factors that determine cell-to-cell variability in receptor-mediated apoptosis. *PLoS Computational Biology*, 8:e1002482.
5. **Spencer SL** and Sorger PK (2011). Measuring and modeling apoptosis in single cells. *Cell*, 144(6):926-39.
4. Kim, KA, **Spencer SL**, Albeck JG, Burke JM, Sorger PK, Gaudet S, Kim do H. (2010). Systematic calibration of a cell signaling network model. *BMC Bioinformatics*, 11:202.
3. Niepel M*, **Spencer SL***, Sorger PK (2009). Non-genetic cell-to-cell variability and the consequences for pharmacology. *Current Opinion in Chemical Biology* 13(5-6):556-61. (♦)

2. **Spencer SL***, Gaudet S*, Albeck JG, Burke JM, Sorger PK (2009). Non-genetic origins of cell-to-cell variability in TRAIL-induced apoptosis. *Nature*, 459(7245):428-32.
 - Recommended as "Exceptional" (8 out of 9 stars) in Faculty of 1000.
 - News and Views by P. Bastiaens. (2009) *Nature*, 459:334-5.
 - Preview by P. Loriaux & A. Hoffmann. (2009) *Molecular Cell*, 34:257-8.
 - Editor's Choice by L. B. Ray. (2009) *Science Signaling*, 2:ec178.
 - Front page article by David Cameron. *Harvard FOCUS*, May 15 2009.
1. Albeck JG, Burke JM, **Spencer SL**, Lauffenburger DA, Sorger PK (2008). Modeling a snap-action, variable-delay switch controlling extrinsic cell death. *PLoS Biology*, 6:e299.

Publications from work prior to PhD

3. Pepper JW, Findlay CS, Kassen R., **Spencer SL**, Maley CC (2009). Cancer research meets evolutionary biology. *Evolutionary Applications* 2(1), 62-70. (♦)
2. **Spencer SL**, Gerety RA, Pienta KJ, Forrest S (2006). Modeling somatic evolution in tumorigenesis. *PLoS Computational Biology*, 2:e108.
1. **Spencer SL**, Berryman MJ, Garcia JA, Abbott D (2004). An ordinary differential equation model for the multistep progression to cancer. *Journal of Theoretical Biology* 231(4), 515-524.