

EDUCATION

- 2007–2011 **Princeton University**
AB in Molecular Biology, *magna cum laude*
Certificate in Quantitative and Computational Neuroscience
Thesis: “Optical measurement and perturbation of neuronal activity in the zebrafish oculomotor integrator”
Advisor: David Tank, Ph.D.
- 2011–2017 **Stanford University**
Ph.D. in Neuroscience
Thesis: “Neural circuits underlying valence-guided decision making”
Advisor: Karl Deisseroth, Ph.D.

HONORS AND AWARDS

- 2019 Career Award at the Scientific Interfaces – Burroughs Wellcome Fund
2018 Hanna H. Gray Fellow Finalist Research Award – Howard Hughes Medical Institute
2018 Allison Doupe Fellowship – McKnight Endowment Fund
2017 Walter V and Idun Berry Postdoctoral Fellowship – Stanford
2017 Sammy Kuo Award for Neuroscience, 2nd Place – Stanford
2016 Ruth L. Kirschstein NRSA Individual Predoctoral Fellowship – Stanford
2012 National Science Foundation Graduate Research Fellowship Program – Stanford
2011 The John Brinster, Class of 1943, Prize in Neuroscience – Princeton
2011 Molecular Biology Senior Thesis Prize – Princeton
2010 Shapiro Fund for Undergraduate Research in Neuroscience Award – Princeton

RESEARCH EXPERIENCE

- 2017–present Alice Ting, Ph.D., Stanford University
Postdoctoral researcher
Molecular and optical tools for cellular-level transcriptomics and activity recording in neural circuits.
- 2012–2017 Karl Deisseroth, M.D./Ph.D., Stanford University
Graduate student
Dissecting the brain-wide neural networks that modulate reward-seeking using *in vivo* functional calcium imaging and optogenetic perturbation.
- 2010–2011 David Tank, Ph.D., Princeton University
Undergraduate student
Optical measurement and perturbation of neuronal activity in the zebrafish oculomotor integrator.

PUBLICATIONS

Postdoctoral

1. **Kim CK**, Cho KF, Kim MW, & Ting AY. Luciferase-LOV BRET enables versatile and specific transcriptional readout of cellular protein-protein interactions. *eLife* **8**, doi:10.7554/eLife.43826 (2019).
2. Jennings JH*, **Kim CK***, Marshel JH*, Raffiee M, Ye L, Quirin S, Ramakrishnan C, & Deisseroth K. Interacting neural ensembles in orbitofrontal cortex for social and feeding behaviour. *Nature* **565**, 645-649 (2019).

- Research Highlight: Whalley K. Balancing competing drives. *Nature Reviews Neuroscience* **20**, 132 (2019).
3. Wang W*, **Kim CK***, & Ting AY. Molecular tools for imaging and recording neuronal activity. *Nature Chemical Biology* **15**, 101-110 (2019).

Graduate

1. de Jong JW*, Afjei SA*, Pollock Dorocic I, Peck JR, Liu C, **Kim CK**, Tian L, Deisseroth K, & Lammel S. A neural circuit mechanism for encoding aversive stimuli in the mesolimbic dopamine system. *Neuron* **101**, 133-151.e7 (2019).
2. **Kim CK***, Ye L*, Jennings JH, Pichamoorthy N, Tang DD, Wang A-C, Ramakrishnan C, & Deisseroth K. Molecular and circuit-dynamical identification of top-down neural mechanisms for restraint of reward-seeking. *Cell* **170**, 1013-1027 (2017).
 - Research Highlight: Bray N. Restraint from risky reward. *Nature Reviews Neuroscience* **18**, 570-571 (2017).
3. **Kim CK***, Adhikari A*, & Deisseroth K. Integration of optogenetics with complementary methodologies in systems neuroscience. *Nature Reviews Neuroscience* **18**, 222-235 (2017).
4. Beier KT, **Kim CK**, Hoerbelt P, Hung LW, Heifets BD, DeLoach KE, Mosca TJ, Neuner S, Deisseroth K, Luo L, & Malenka RC. Rabies screen reveals GPe control of cocaine-triggered plasticity. *Nature* **549**, 345-350 (2017).
5. Selimbeyoglu A, **Kim CK**, Inoue M, Lee SY, Hong ASO, Ramakrishnan C, Fenno LE, Davidson TJ, Wright M, & Deisseroth K. Modulation of prefrontal cortex excitation/inhibition balance rescues social behavior in *CNTNAP2*-deficient mice. *Science translational medicine* **9**, eaah6733 (2017).
6. Grosenick LM*, Broxton M*, **Kim CK***, Liston C*, Poole B, Yang SJ, Andalman AS, Scharff E, Cohen N, Yizhar O, Ramakrishnan C, Ganguli S, Suppes P, Levoy M, & Deisseroth K. Identification of cellular-activity dynamics across large tissue volumes in the mammalian brain. *BioArXiv* [pre-print], doi:10.1101/132688 (2017).
7. **Kim CK***, Yang SJ*, Pichamoorthy N, Young NP, Kauvar I, Jennings JH, Lerner TN, Berndt A, Lee SY, Ramakrishnan C, Davidson TJ, Inoue M, Bito H, & Deisseroth K. Simultaneous fast measurement of circuit dynamics at multiple sites across the mammalian brain. *Nature Methods* **13**, 325-328 (2016).
 - Patent application 62257140, "Method and Systems for Measuring Neural Activity". Licensed to www.neurophotometrics.com.
8. Rajasethupathy P*, Sankaran S*, Marshel JH*, **Kim CK**, Berndt A, Lee SY, Jaffe A, Liston C, & Deisseroth K. Projections from neocortex mediate top-down control of memory retrieval. *Nature* **526**, 653-659 (2015).
9. Yang SJ, Allen WE, Kauvar I, Andalman AS, Young NP, **Kim CK**, Marshel JH, Wetzstein G, & Deisseroth K. Extended field-of-view and increased-signal 3D holographic illumination with time-division multiplexing. *Optics Express* **23**, 32573-32581 (2015).
10. Kimpo RR*, Rinaldi JM*, **Kim CK***, Payne HL*, & Raymond JL. Gating of neural error signals during motor learning. *eLife* **3**, doi:10.7554/eLife.03061 (2014).
11. Kim SY*, Adhikari A*, Lee SY, Marshel JH, **Kim CK**, Mallory CS, Lo M, Pak S, Mattis J, Lim BK, Malenka RC, Warden MR, Neve R, Tye KM, & Deisseroth K. Diverging neural pathways assemble a behavioural state from separable features in anxiety. *Nature* **496**, 219-223 (2013).

Undergraduate

1. **Kim CK**, Miri A, Leung L, Berndt A, Mourrain P, Tank DW, & Burdine RD. Prolonged, brain-wide expression of nuclear-localized GCaMP3 for functional circuit mapping. *Frontiers in Neural Circuits* 8, doi:10.3389/fncir.2014.00138 (2014).

SELECTED ABSTRACTS AND PRESENTATIONS

- 2019 Optical and molecular approaches for accessing activated neural ensembles, Speaker. CNC Program Symposium. Stanford, CA.
- 2019 High-throughput functional circuit mapping using a light- and calcium-dependent transcription factor and RNA-seq, Speaker. CMN Science Meeting. Stanford, CA.
- 2018 Targeting the glutamate circuits that regulate reward-seeking, Speaker. Hanna H. Gray Fellows Finalist Symposium. Chevy Chase, MD.
- 2018 Luciferase-LOV BRET for the control of molecular actuators in living cells, Speaker. Stanford Vision Research Seminar. Palo Alto, CA.
- 2018 Molecular tools for gaining genetic access to activated neural ensembles, Poster. McKnight Conference on Neuroscience. Aspen, CO.
- 2018 Luciferase-LOV BRET for the control of molecular actuators in living cells, Speaker. Stanford Biology Department Retreat. Petaluma, CA.
- 2018 New optical/molecular approach for working with activated neural ensembles, Speaker. Stanford Neurosciences Institute Retreat. Monterey, CA.
- 2017 Circuit-level and molecular tools for studying top-down restraint of reward-seeking, Speaker. UCSF Neuroscience External Postdoc Seminar Program. San Francisco, CA.
- 2017 Functional identification of top-down neural mechanisms for restraint of reward-seeking, Attendee. Janelia Neural Circuits and Behavior Workshop. Ashburn, VA.
- 2013 *In vivo* functional calcium imaging of CA3 neurons in mouse hippocampus, Speaker. Functional Brain Imaging at Cellular Resolution: The New Frontier of Brain Mapping speaker. Society for Neuroscience, San Diego CA.

TEACHING AND MENTORSHIP

- Bi-annual Optogenetics Innovation Lab Fiber Photometry Workshop (2015–current)
- Stanford first generation/low-income undergraduate student mentor (2017–current)
- Stanford Women in Science and Engineering (2017–2018)
- Stanford undergraduate student research mentor (2015–2017)
- Optogenetics Innovation Lab workshop mentor (2013 and 2017)
- Mentor for Stanford SBSA Fellowship Writing (2013 and 2014)
- Teaching Assistant for Stanford NENS220: Computational Neuroscience (2013)
- Teaching Assistant for Stanford Intensive Neuroscience Workshop (2012)

TECHNIQUES AND SKILLS

- Two-photon cellular resolution and optical-fiber bulk calcium imaging and optogenetic stimulation (building 1-photon microscopes and aligning lasers).
- High proficiency in data analysis and programming in MATLAB (cell extraction, image processing, dynamical systems analysis of large data sets) and Python.
- Engineering custom mouse behavioral setups (head-fixed virtual reality environment, capacitive sensor-based lickometer, head-fixed lever press, foot shock, and reward delivery system).
- Mouse surgeries (GRIN lens implants, cortical windows, multi-optical fiber implants).

- Molecular biology and protein engineering (plasmid design and generation, AAV and lentivirus production)
- Cell culture work (human embryonic kidney cells, rat cultured neurons)
- Single-cell RNA sequencing of adult mouse brain tissue