

Curriculum Vitae – Alex Kwan

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Education

1998 – 2003 B.A.Sc., Engineering Physics, Simon Fraser University
2003 – 2009 Ph.D., Applied Physics, Cornell University (Advisor: Watt W. Webb)
2009 – 2013 Postdoc, Neurobiology, University of California, Berkeley (Advisor: Yang Dan)

Positions

2013 – 2019 Assistant Professor, Department of Psychiatry, Yale University
2019 – 2022 Associate Professor, Department of Psychiatry, Yale University
2022 – present Associate Professor, Meinig School of Biomedical Engineering, Cornell University
2023 – present Associate Professor, Dept. of Psychiatry, Weill Cornell Medicine (secondary appointment)

Research interests and selected publications

1) Drug action on synapses and dendrites

Shao LX, Liao C, Gregg I, Davoudian PA, Savalia NK, Delagarza K, and Kwan AC. Psilocybin induces rapid and persistent growth of dendritic spines in frontal cortex in vivo. *Neuron* (2021).

Jefferson SJ, Gregg I, Dibbs M, Liao C, Wu H, Davoudian PA, Woodburn SC, Wehrle PH, Sprouse JS, Sherwood AM, Kaye AP, Pittenger C, and Kwan AC. 5-MeO-DMT modifies innate behaviors and promotes structural neural plasticity in mice. *Neuropsychopharmacology* (2023).

Liao C*, O’Farrell E*, Qalieh Y, Savalia NK, Girgenti MJ, Kwan KY, and Kwan AC. Single-nucleus transcriptomics reveals time-dependent and cell-type-specific effects of psilocybin on gene expression. *bioRxiv*.

Savalia NK, Shao LX, and Kwan AC. A dendrite-focused framework for understanding the actions of ketamine and psychedelics. *Trends in Neurosciences* (2021).

2) Drug action on neural circuit dynamics

Ali F, Gerhard DM, Sweasy K, Pothula S, Pittenger C, Duman RS, and Kwan AC. Ketamine disinhibits dendrites and enhances calcium signals in prefrontal dendritic spines. *Nature Communications* (2020).

Woodburn SC, Levitt CM, Koester AM, and Kwan AC. Psilocybin facilitates fear extinction: importance of dose, context, and serotonin receptors. *ACS Chemical Neuroscience* (2024).

Shao LX*, Liao C*, Davoudian PA, Savalia NK, Jiang Q, Wojtasiewicz C, Tan D, Nothnagel JD, Liu RJ, Woodburn SC, Bilash OM, Kim H, Che A, and Kwan AC. Pyramidal cell types and 5-HT_{2A} receptors are essential for psilocybin’s lasting drug action. *bioRxiv*.

Kwan AC, Olson DE, Preller KH, and Roth BL. The neural basis of psychedelic action. *Nature Neuroscience* (2022).

3) Optical methods for drug discovery

Davoudian PA, Shao LX, and Kwan AC. Shared and distinct brain regions targeted for immediate early gene expression by ketamine and psilocybin. *ACS Chemical Neuroscience* (2023).

Aboharb F, Davoudian PA, Shao LX, Liao C, Rzepka GN, Wojtasiewicz C, Indajang J, Dibbs M, Rondeau J, Sherwood AM, Kaye AP, and Kwan AC. Classification of psychedelics and psychoactive drugs based on brain-wide imaging of cellular c-Fos expression. *bioRxiv*.

Liao C, Dua A, Wojtasiewicz C, Liston C, and Kwan AC. Structural neural plasticity evoked by rapid-acting antidepressant interventions. *Nature Reviews Neuroscience* (2025).

Ali F and Kwan AC. Interpreting in vivo calcium signals from neuronal cell bodies, axons, and dendrites: a review. *Neurophotonics* (2020).

Awards and honors

Croucher Fellowship (2009)

NARSAD Young Investigator (2014)

One Mind – Compass Rising Star Award (2022)

Grants

NIH R01 MH121848 (PI: Kwan, 2020 – 2025)

NIH R01 MH128217 (PI: Kwan, 2022 – 2027)

NIH R01 MH137047 (PI: Kwan, 2024 – 2029)

One Mind – Compass Rising Star Award (PI: Kwan, 2023 – 2025)

Intra-Cellular Therapies sponsored research (PI: Kwan, 2023 – 2025)

NIH U01 NS128660 (PI: Xu, co-I: Kwan, 2022 – 2026)

NIH R13 MH140493 (PI: Kwan, 2025 – pending; impact score 10)

Recent talks (* scheduled)

2024: UCSF, ISRP, Johns Hopkins, NEURON conference, UC Santa Barbara, PsychedelX, Delix Therapeutics, BU, EBPS workshop, UW Madison, Univ. Buffalo, ACNP, Med College Wisconsin

2025: UAB, UIC*, UBC*, Maryland School of Medicine*, Univ. Calgary*, Sainsbury Wellcome*

2026: Stanford*

Teaching and outreach

2018 – present Skype a Scientist (totaling 10 classrooms in NJ, ME, CA, AL, MA, GA)

2023 – present BME 3310/5310: Medical and Preclinical Imaging

2023 – present BME 6350: Introduction to Neurotechnology

2024 – present BME 7900: Biomedical Engineering Graduate Colloquium

Professional service

2017 – present NIH grant review (selected): 2021: ZMH1 ERB-L 02, ZRG1 IFCN-U 02, ZRG1 IFCN-T 55; 2022: ZMH1 ERB-M 04; 2023: ZMH1 ERB-M 03, ZRG1 ICN-A 02, ZMH1 ERB-M 02; 2024: ZDA1 BSW-N M2, PMDA, ZAT1 AM (07); ZMH1 ERB-S(01); 2025: MCNP

2023 – present Editorial board, Neuropsychopharmacology - Digital Psychiatry and Neuroscience

2023 – present Scientific advisory board: Empyrean Neuroscience, Freedom Biosciences, Xylo Bio

2023 Lead organizer, 4th Annual Rising Stars in Engineering in Health Workshop

2025 Founding co-chair, Gordon Research Conference *Neurobiology of Psychedelics*