KELLY CHEN

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EDUCATIONAL BACKGROUND AND AWARDS

Massachusetts Institute of Technology (MIT) **Cambridge, MA**
B.S. Mathematics; B.S. Chemistry; Concentration in Science, Technology, and Society Graduated May 2022

- Cumulative GPA: 4.9/5.0; Chemistry GPA: 5.0/5.0
- 2022 MIT Department of Chemistry Alpha Chi Sigma Award recipient (for outstanding achievement in scholarship, research, and service)

RESEARCH IN CHEMISTRY AND MOLECULAR BIOLOGY

MIT, Department of Chemistry, Hong Lab **Cambridge, MA and Remotely**
Undergraduate Researcher (PI: Mei Hong) January 2020–June 2022

- Ran protein-ligand docking simulations to predict binding sites, geometries, and interactions between polymorphic β-amyloid fibrils and imaging agent flutemetamol
- Ran numerical simulations to develop new ^{13}C-^{2}H REDOR NMR technique for measuring site-specific conformational dynamics of proteins and other biomacromolecules

MIT, Department of Chemistry, Van Voorhis Group **Cambridge, MA**
Undergraduate Researcher (PI: Troy Van Voorhis) June 2018–June 2019

- Helped develop automated pipeline for generating molecular geometry files of functionalized graphite-conjugated catalyst candidates for oxygen reduction
- Ran density functional theory calculations to predict binding geometries and energetics, and identified correlations with functional group identity and location

MIT, Department of Brain and Cognitive Sciences, Bioelectronics Group **Cambridge, MA**
Undergraduate Researcher (PI: Polina Anikeeva) January–May 2018

- Cloned DNA, packaged viruses, cultured and transfected HEK and rat hippocampal cells to develop technique for remotely inhibiting neurons using magnetic nanoparticles and heat-sensitive ion channels

RESEARCH IN BIOETHICS AND THE HISTORY OF SCIENCE

National Institutes of Health (NIH), National Human Genome Research Institute, Bioethics Core and the Office of Communications **Bethesda, MD**
Postbaccalaureate Research Fellow (Advisor: Sara Chandros Hull) September 2024–Present

- Conduct historical research, support genomics-related bioethics and science communication efforts, and assist with processing genomic data access requests
- Research projects: *[redacted per current federal policies]*
- Science communication projects: script-writing for *Way Cool Genomics!* video series, which discusses impactful research findings with a general audience *[currently on hiatus per federal restructuring]*

NIH, Clinical Center, Department of Bioethics **Bethesda, MD**
Postbaccalaureate Research Fellow (Advisor: Sara Chandros Hull) September 2023–September 2024

- Received training in clinical and research ethics, including observation of patient care, human subjects research oversight, and related ethics consultations
- Thematically analyzed semi-structured interview transcripts to characterize ethical norms and disagreements in the dual-use research community (manuscript in preparation)

MIT, Program in Science, Technology, and Society **Cambridge, MA**
Undergraduate Researcher (Advisor: Robin Scheffler) February 2022–June 2022

- Cross-referenced oral history transcripts from individuals involved in the 1960s–1980s recombinant DNA controversy in Cambridge, MA to determine key factors in the resolution of the controversy

RESEARCH IN PURE AND APPLIED MATHEMATICS

Brown University, Summer@ICERM Program **Providence, RI**
Undergraduate Summer Researcher (Advisor: Jane Wang) June–August 2021

- Proved that every n-interval affine interval exchange transformation has at most n distinct periodic orbits
- Conjectured based on computational evidence that almost every non-surjective affine interval exchange transformation has an attracting periodic orbit

University of Minnesota Twin Cities, School of Mathematics **Minneapolis, MN (Held Remotely)**
Undergraduate Summer Researcher (Advisor: Arnd Scheel) June–July 2020

- Studied traveling-wave solutions to the two-dimensional phase-diffusion equation with nonlinear boundary condition using theoretical and numerical methods
- Determined the dependence of the rate of domain expansion on the solution wavenumbers in the limiting cases

Indiana University Bloomington, Department of Mathematics **Bloomington, IN**
Undergraduate Summer Researcher (Advisor: Christopher Judge) June–August 2019
- Proved the existence of Dirichlet eigenfunctions of the Laplacian with critical points of Poincaré-Hopf index zero
- Results uploaded to REU website and presented at 2019 Undergraduate Mathematics Symposium, University of Illinois at Chicago

OTHER WORK EXPERIENCE

Dark Monk **Salem, MA**
Prop Builder September 2022–May 2023
- Manufactured custom equipment for performers and hobbyists in fire-spinning, fire eating, and related arts

PEER-REVIEWED PUBLICATIONS

- N.D. Ricke, **K.J. Chen**, and T. Van Voorhis, *Exploring Scaling Relations and Active Site Specificity of Graphite-Conjugated Catalysts Using Density Functional Theory*, **J. Phys. Chem. C** 127, 13582–13592 (2023).
- K. Lodaya, N.D. Ricke, **K.J. Chen**, and T. Van Voorhis, *Machine Learning Identification of Active Sites in Graphite-Conjugated Catalysts*, **ACS Cent. Sci.** 127, 2303–2313 (2023).
- P. Duan, **K.J. Chen**, G. Wijegunawardena, A.J. Dregni, H.K. Wang, H. Wu, and M. Hong, *Binding Sites of a Positron Emission Tomography Imaging Agent in Alzheimer's β-Amyloid Fibrils Studied Using ^{19}F Solid-State NMR*, **J. Am. Chem. Soc.** 144, 1416–1430 (2022).
- **K.J. Chen**, Z. Deiman, R. Goh, S. Jankovic, and A. Scheel, *Strain and Defects in Oblique Stripe Growth*, **Multiscale Model. Simul.** 19, 1236–1260 (2021).
- M.D. Gelenter, **K.J. Chen**, and M. Hong, *Off-Resonance ^{13}C-^{2}H REDOR NMR for Site-Resolved Studies of Molecular Motion*, **J. Biomol. NMR** 75, 335-345 (2021).

TECHNICAL SKILLS

Chemistry	Solution- and solid-state NMR spectral assignment, FTIR, UV-Vis, basic inorganic synthesis
Molecular Biology	DNA cloning, PCR, transfection, gel electrophoresis, rat tissue harvest, affinity chromatography
Design and Fabrication	Manual lathe, manual mill, laser cutter, SolidWorks
Programming Languages	Python, MATLAB, Java, Wolfram Mathematica
Languages	English (fluent), Mandarin Chinese (fluent), Spanish (conversational)

LEADERSHIP AND COMMUNITY-BUILDING

MIT Spinning Arts Club **Cambridge, MA**
President (May 2021–June 2022) August 2017–Present
Executive Team (May 2019–June 2022)
Fire Safety Trainer (September 2019–Present)
- Group description: student club for fire performance arts and related activities, including object manipulation, fire breathing, and fire eating
- As president: led exec team and safety trainers in organizing workshops, practices, and performances for the MIT community
- As safety trainer: ran fire safety trainings and prop-making workshops, and staffed fire practices and show rehearsals; currently assist in an alum capacity

MIT iHouse **Cambridge, MA**
President (June 2020–June 2021) April 2019–June 2022
- Group description: dorm community for students passionate about social justice, sustainability, and international development
- My role: led exec team and interfaced with other communities and administrators at MIT to organize social events, recruitment of new residents and social members, and mental health resources

MIT Student Information Processing Board **Cambridge, MA**
Chair (February 2021–February 2022) March 2019–June 2022
- Group description: volunteer student computing group that creates and maintains computing resources, tools, and technical expertise to the MIT community
- My role: led weekly meetings and interfaced with MIT IT and administrators on joint efforts

MIT Terrascope **Cambridge, MA**
Associate Advisor (May 2018–June 2022) August 2017–June 2022
- Group description: project-based first-year learning community focused on addressing complex environmental issues
- My role: advised and supported first-year students in the transition to MIT, class selection, and major declaration

TEACHING AND OUTREACH

CovEducation **Online**
Mentor March 2020–June 2022
- Group description: online platform at `www.coved.org`, designed and built by students across multiple universities, for matching volunteer undergraduate mentors with underserved K-12 students impacted by school closures during the COVID-19 pandemic
- My role: provided free weekly math tutoring and online curricula to multiple students