

## Katherine A. Beck, PhD

### Staff Scientist



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#### Practice Areas

Intellectual Property Protection

#### Education

Columbia University  
PhD (2024) Organic Chemistry

Cornell University  
BA (2018) Chemistry and Chemical  
Biology, *cum laude*  
BA (2018) Psychology, *cum laude*

Dr. Katherine Beck assists Choate's life sciences clients by utilizing her background in organic chemistry and chemical biology to help with the preparation and prosecution of patent applications, as well as freedom-to-operate and patentability analyses.

#### Industry Experience

Katherine received her PhD in organic chemistry at Columbia University. Her doctoral research, conducted with Professor Tomislav Rovis and in collaboration with the pharmaceutical industry, involved the development and application of first-in-class low-energy photoredox catalysis methodologies in pharmacophore synthesis with a library of novel osmium and iridium catalysts. Specifically, her dissertation describes new methods of imparting molecular diversity and dimensionality, enabling late-stage functionalization, and expanding the scope of functional group stability towards batch-scale applications.

Prior to her PhD, she worked as a Senior Research Support Associate in the group of Professor Kwanghun Chung at the Massachusetts Institute of Technology. While at MIT, she developed and assisted American and international collaborators on techniques and workflow for large-scale neurobiology and chemical engineering projects involving antibody and nucleic acid probe staining, high-throughput microscopy, and whole-organ preservation for molecular mapping.

Katherine received her undergraduate degrees from Cornell University in Chemistry and Psychology (Neuroscience concentration). There, she worked as a research assistant in the Computational Physiology Laboratory under Professor Thomas Cleland, where she gained experience with transgenic animal models, immunohistochemistry, and tissue preservation techniques.

#### Publications and Presentations

- "From Structure to Function: Designing Iridium Catalysts with Spin-Forbidden Excitation for Low-Energy Light-Driven Reactions," co-author, in revision
- "Uniform volumetric single-cell processing for organ-scale molecular phenotyping," co-author, *Nature Biotechnology*, January 2025
- "Dual Nickel/Photoredox-Catalyzed Aryl Etherification Enabled by an Oxidative Near-Infrared-to-Blue Triplet-Triplet Annihilation Upconversion System Leveraging Spin-Forbidden Excitation," co-author, *ACS Catalysis*, December 2024
- "A Unified Method for Oxidative and Reductive Decarboxylative Arylation with Orange Light-Driven Ir/Ni Metallaphotoredox Catalysis," first author, *Journal of the American Chemical Society*, September 2024
- "Orange Light-Driven C(sp<sup>2</sup>)-C(sp<sup>3</sup>) Cross-Coupling via Spin-Forbidden Ir(III) Metallaphotoredox Catalysis," student award presenter, *International Precious Metals Institute*, June 2024
- "Orange Light-Driven C(sp<sup>2</sup>)-C(sp<sup>3</sup>) Cross-Coupling via Spin-Forbidden Ir(III) Metallaphotoredox Catalysis," presenter, *Synthesis Workshop*, February 2024

- “Orange Light-Driven C(sp<sup>2</sup>)–C(sp<sup>3</sup>) Cross-Coupling via Spin-Forbidden Ir(III) Metallaphotoredox Catalysis,” presenter, ACS Conference, Fall 2023
- “Orange Light-Driven C(sp<sup>2</sup>)–C(sp<sup>3</sup>) Cross-Coupling via Spin-Forbidden Ir(III) Metallaphotoredox Catalysis,” co-first author, Journal of the American Chemical Society, August 2023
- “Orange Light-Driven C(sp<sup>2</sup>)–C(sp<sup>3</sup>) Cross-Coupling via Spin-Forbidden Ir(III) Metallaphotoredox Catalysis,” presenter, Women in Chemistry/Merck Virtual Symposium, May 2023
- “Red-Shifting Blue Light Photoredox Catalysis for Organic Synthesis: A Graphical Review,” co-author, SynOpen, January 2023
- “Functional dissection of neural circuitry using a genetic reporter for fMRI,” co-author, Nature Neuroscience, March 2022
- “Tuning the Electrochemical and Photophysical Properties of Osmium-Based Photoredox Catalysts,” co-author, Synlett, January 2022