Kevin E. Stone

Process Development & Data Science Leader

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SUMMARY

Chemical engineer with eleven years at Merck, from small-molecule reaction engineering in the lab to leading process modeling and analytics for biologics. Experimental work in the filings and commercial processes of eight approved medicines.

CORE COMPETENCIES

Leadership: Team development, cross-functional leadership, technical strategy, vendor and partner management

Modeling & AI: Mechanistic and hybrid modeling, neural ODEs, Bayesian optimization, Python, machine learning

Process & Lab: Reaction engineering, scale-up and tech transfer, chromatography, PAT, HTE, biocatalysis, CMC

PROFESSIONAL EXPERIENCE

Director | DSCS Digital, Process Modeling & Analytics | 2026 - Present

Merck & Co., Inc.

- Managed the team's transition through a department reorganization, guiding 11 colleagues into new roles and welcoming 9 colleagues from elsewhere at Merck as the group refocused on digital solutions for bioprocess drug-substance development
- Direct five chromatography mechanistic models (MMCEX, flow-through AEX, HIC), cutting wet-lab resources up to 30% and widening process operating ranges up to 50%
- Advance hybrid neural-ODE upstream modeling that improves experimental efficiency up to 50% in DOE execution and control-strategy definition
- Roll GARNET workflows out across upstream biologics development so more scientists can build and use the models

Director | PR&D; Data-Rich Experimentation | 2025 - 2026

Merck & Co., Inc.

- Led a 13-FTE team (plus contractors) spanning biologics high-throughput experimentation, small-molecule catalysis, and process modeling, earning above-benchmark leadership ratings on 13 of 15 dimensions
- Scaled Bayesian optimization and Algorithmic Process Optimization to 100+ active users and about 50 optimizations per year across 20+ program steps; adoption has since grown to about 200 optimizations per year
- Developed GARNET, a neural-ODE approach for upstream cell culture and fermentation that produces accurate, data-efficient models from limited experiments
- Applied GARNET to improve titer 15% and harvest-day viability 20% in a lab proof of concept on a separate pipeline program and reduce process-characterization resources by up to 50%

Associate Principal Scientist -> Principal Scientist | PR&D; Data-Rich Experimentation | 2022 - 2025

Merck & Co., Inc.

- Founded Algorithmic Process Optimization (APO), onboarding 57 active users through an interactive "OptiThon" hackathon and SME office hours across 9 campaigns in small- and large-molecule modalities
- Authored and published obsidian, PR&D;'s first open-source codebase, for Bayesian optimization in process and materials research on BoTorch/GPyTorch
- Brought Bayesian optimization to mRNA in-vitro transcription, more than doubling the combined yield-and-purity objective across 11 parameters in 42 reactions; campaigns used 25-75% fewer wet-lab resources
- Developed neural-ODE deep-learning models (GARNET) for data-efficient bioreactor cell-culture modeling

Senior Scientist | CERD Reaction Engineering Lab | 2019 - 2022

Merck & Co., Inc.

- Redesigned the molnupiravir API-forming reaction in a 4-week campaign, achieving more than a 5x stability window, higher yield, and an order-of-magnitude lower impurity load, and supporting tech transfer for pandemic-era COVID-antiviral supply
- Led scale-up of two scale-sensitive belzutifan steps from bench to commercial tech transfer, de-risking mass and heat transfer, multiphase thermodynamics, and reaction kinetics
- Established Merck's synthetic-electrochemistry engineering strategy and scaled an electrochemical oxidation to kilograms (OPRD Outstanding Publication of the Year, 2022)
- Elucidated the islatravir kinase yield-loss mechanism, redirecting the team to a higher-yield immobilized-enzyme process proven at kilogram scale

Associate Scientist -> Scientist | Chemical Engineering Research & Development | 2015 - 2019

Merck & Co., Inc.

- Technical lead for multiple doravirine synthetic steps through development, tech transfer, filing, and launch (Delstrigo and Pifeltro)
- Authored 150+ pages of process-development reports and co-authored CMC sections (S.2.2, S.2.6) supporting the doravirine NDA filing
- Supervised the 6-week commercial PPQ campaign in Ballydine, Ireland, correcting critical operational issues that saved multiple batches, and delivered 700+ kg of quality and clinical-supply API across campaigns

- Improved alkylation yield 5-10% by discovering a high-temperature isomerization, and designed a batch-sheet reagent-charge model that eliminated through-process sensitivity in the filed commercial process

EDUCATION

M.S., Analytics | Georgia Institute of Technology | 2023

B.S., Chemical Engineering | University of Delaware | 2015

SELECTED PUBLICATIONS

- Electrochemical Recycling of Adenosine Triphosphate in Biocatalytic Reaction Cascades. J. Am. Chem. Soc., 2022.
- Kilo-Scale Electrochemical Oxidation of a Thioether to a Sulfone. Org. Process Res. Dev., 2022.
- High-Throughput Algorithmic Optimization of In Vitro Transcription for SARS-CoV-2 mRNA Vaccine Production. Biochemistry, 2024.
- Case Studies on Enabling Data-Rich, Parallelized Kinetic Analysis for Process Optimization with the ReactALL Platform. Org. Process Res. Dev., 2026.

HONORS & AWARDS

- ACS GCI Pharmaceutical Roundtable, Data Science & Modeling for Green Chemistry (2025)
- ACS Division of Organic Chemistry, Technical Achievements in Organic Chemistry (2024)
- Organic Process Research & Development Outstanding Publication of the Year (2022)
- Merck MS&T; Innovation Award runner-up (2021)