

ByeongJae (Ben) Chun

Technical Lead | Chemical Engineer | AI Contributor

Winchester, KY, USA

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PROFESSIONAL SUMMARY

Ph.D. Chemical Engineer and AI training specialist with an interdisciplinary background in computational biology, pharmaceutical manufacturing, and higher education. Proven track record in developing, reviewing, and refining high-quality data to support AI alignment in complex scientific domains. Extensive experience in molecular simulations, technical writing, and critical evaluation of AI-generated outputs across chemical engineering, physics, and life sciences. Skilled collaborator and problem-solver with a sharp eye for detail and a passion for scientific accuracy.

CORE COMPETENCIES

- AI Model Training & Evaluation (Snorkel, TELUS Marvel Project)
 - Chemical Engineering | Thermodynamics | Reaction Engineering
 - Molecular Dynamics & Multiscale Computational Modeling
 - Scientific Problem-Solving & Instructional Content Design
 - Data Annotation & Technical Writing
 - Python Programming | Machine Learning Concepts
 - Cross-Functional Collaboration | Project Leadership
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PROFESSIONAL EXPERIENCE

AI Training Contributor

Snorkel.ai — Remote | Feb 2025 – Apr 2025

- Completed a 10-week AI alignment program with in-depth review of AI-generated outputs in physics, chemistry, and engineering.
- Created step-by-step solutions and high-fidelity datasets to improve model reasoning and domain relevance.
- Identified knowledge gaps and conceptual inconsistencies; contributed to red-teaming efforts to test AI model boundaries.

AI Training Contributor

TELUS International (Marvel Project) — Remote | 2025 – Present (project ending April 29)

- Reviewed and annotated AI-generated scientific content to enhance accuracy, clarity, and educational soundness.
- Specialized in visual question answering (VQA): evaluated model responses to image-based science questions and provided natural language feedback.
- Contributed to AI model development by critically assessing image interpretation and written explanations.

Technical Lead – Production

Catalent Pharma Solutions — Winchester, KY | May 2023 – Present

- Led the formulation and scale-up of oral solid dosage products from R&D through manufacturing.
- Collaborated with engineering, quality, and project management teams to ensure GMP compliance and production excellence.
- Diagnosed process issues and implemented optimizations for efficiency and quality improvement.

Associate Scientist

Catalent Pharma Solutions — Winchester, KY | Jan 2022 – May 2023

- Designed and executed experiments for tablets, capsules, and powder formulations.
- Specialized in fluid bed coating, encapsulation, and analytical techniques.
- Authored comprehensive technical reports for regulatory and client-facing documentation.

Research Associate – Computational Biology

Loyola University Chicago — Chicago, IL | Aug 2019 – Jan 2022

- Modeled neuroinflammatory responses in microglia using Python and machine learning tools.
- Mentored undergraduate and high school students in coding and data analysis.

Postdoctoral Researcher – Neuroinflammation Modeling

University of Kentucky — Lexington, KY | Sep 2017 – Jul 2019

- Conducted simulations of immune signaling in brain cells, contributing to collaborative systems biology research.

Postdoctoral Fellow & Graduate Research Assistant

Georgia Institute of Technology — Atlanta, GA | Jan 2011 – Sep 2016

- Performed thermodynamic modeling of nanostructured polymers and membrane systems.
- Utilized LAMMPS, NAMD, and DFT for multiscale simulations.
- Supervised over 40 undergraduate researchers and supported successful AIChE poster presentations.

Adjunct Chemistry Faculty

Oglethorpe University & Kennesaw State University — GA | 2016 – 2017

- Taught general chemistry laboratories and developed supplemental instruction for chemistry and science majors.
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EDUCATION

Ph.D., Chemical Engineering — Georgia Institute of Technology

B.S., Chemical Engineering — The University of Texas at Austin

Certificate, Computational Physiology — Simula Research Laboratory (2018)

AI & TECHNICAL TRAINING

- **10-Week AI Alignment Program (2025):**
Classical/Modern Physics, Chemistry, Thermodynamics, Polymer Science, Food & Pharmaceutical Sciences, Petroleum Engineering, Oceanography, Photon Science
 - **High-Performance Computing:** LAMMPS, NAMD, TACC Stampede
 - **Programming & Tools:** Python, Linux, Labelbox Annotation Platform
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CERTIFICATIONS

- Process Improvement Foundations
 - Lean Six Sigma Foundations
 - A3 Problem Solving for Continuous Improvement
 - Gemba Kaizen (Blinkist Summary)
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SELECTED PUBLICATIONS

- *Influence of Polydopamine Deposition Conditions on Water Flux and Fouling in Membranes*
 - *Simulation of P2X-Mediated Calcium Signaling in Microglia*
 - *Molecular Dynamics Study of SDS Micelle Behavior*
 - *Uniaxial Deformation Effects on Nafion Transport Properties*
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LANGUAGES

- English (Fluent)
 - Korean (Native)
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HONORS & AWARDS

- ACC President's Honor Roll
- UT Engineering Honor Roll

AVAILABILITY

Available for part-time, remote AI training and scientific content evaluation roles. Flexible scheduling.

INTERESTS

AI Alignment | Scientific Communication | Membrane Science | Quantum Biology | Neuroengineering | EdTech | Language Models | Complex Systems

PUBLICATIONS

- **Title:** Purinoreceptors and ectonucleotidases control ATP-induced calcium waveforms and calcium-dependent responses in microglia: Roles of P2 receptors and CD39 in ATP-stimulated microglia **Publisher:** Frontiers in Physiology **Year:** 2023
- **Title:** Monitoring of inflammation using novel biosensor mouse model reveals tissue- and sex-specific responses to western diet **Publisher:** *[Publisher not explicitly stated in the provided text, Publication date: Apr 25, 2022]* **Year:** 2022
- **Title:** Crowding within synaptic junctions influence the degradation of adenoside nucleotides by CD39 and CD73 ectonucleotidases **Publisher:** Biophysical Journal **Year:** 2022
- **Title:** Outer membrane protein size and LPS O-antigen define protective antibody targeting to the Salmonella surface **Publisher:** Nature Communications **Year:** 2020
- **Title:** Simulation of P2X-mediated Calcium Signaling in Microglia **Publisher:** Journal of Physiology **Year:** 2018
- **Title:** Dissipative Particle Dynamics Simulation Study of Poly(2-Oxazoline)-based Multicompartment Micelle Nanoreactor **Publisher:** Physical Chemistry Chemical Physics **Year:** 2016
- **Title:** Characterization of molecular association of poly(2-oxazoline)s-based micelles with various epoxides and diols via the Flory–Huggins theory: a molecular dynamics simulation approach **Publisher:** Physical Chemistry Chemical Physics **Year:** 2015
- **Title:** Molecular dynamics simulation study of sodium dodecyl sulfate micelle: Water penetration and sodium dodecyl sulfate dissociation **Publisher:** Colloids and Surfaces A: Physicochemical and Engineering Aspects **Year:** 2015
- **Title:** Adsorption of carboxylate on calcium carbonate (1014) surface: Molecular simulation approach **Publisher:** Colloids and Surfaces A: Physicochemical and Engineering Aspects **Year:** 2015

- **Title:** Effect of Uniaxial Deformation on Structure and Transport in Hydrated Nafion 117: Molecular Dynamics Simulation Study **Publisher:** Materials Performance and Characterization **Year:** 2015
- **Title:** Influence of polydopamine deposition conditions on pure water flux and foulant adhesion resistance of reverse osmosis, ultrafiltration, and microfiltration membranes **Publisher:** Polymer **Year:** 2010