Jackson Stempel

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Research focus: AI for biochemistry; docking, design, drug discovery.

Education

University of Tennessee, Knoxville — Expected May 2026
B.S. Biochemistry & Cellular and Molecular Biology; Minor in Geology — GPA: 3.99

University of Arizona, Honors College — Fall 2022–Spring 2023
Coursework toward B.S. — GPA: 3.968

Research Experience

UT/ORNL Center for Molecular Biophysics — 2025–Present
Undergraduate Research Assistant

- Mentor: Micholas D. Smith; PI: Jeremy C. Smith.
- Built a reproducible benchmark for lipid–ligand pose prediction comparing ML (Boltz) vs AutoDock Vina across a curated lipid-binding protein PDB dataset.
- Computed structural metrics (RMSD) via custom Python pipeline.
- **Preliminary result:** Boltz consistently placed lipids more accurately than Vina's best-of-ten poses (median RMSD 1.30 Å vs 2.00 Å); results informing a manuscript in preparation.

NSF IRES — Research Abroad, University of Parakou (with UTK) — May–July 2024
Summer Research Intern

- PI: Orou G. Gaoue, PhD.
- Investigated how anthropogenic disturbance by Fulani pastoralism impacts weaver ant–scale insect interactions in West African mahogany forests; designed field protocols and hypotheses.
- Collected ecological field data and performed structural equation modeling (SEM) to analyze relationships among disturbance, tree traits (e.g., DBH), ant nest size, and scale insect abundance.
- **Presented findings** at the University of Parakou research symposium; drafted a manuscript covering methods and preliminary inferences.

Publications — Manuscripts & Works in Progress

Stempel, J.; Smith, M. D. *Benchmarking lipid–ligand docking accuracy: Boltz vs AutoDock Vina.* (2025)

Manuscript in preparation. Preliminary result: Boltz median RMSD: 1.30 Å vs Vina: 4.88 Å (best-of-10: 2.00 Å) on a curated lipid-binding protein dataset.

Practical & Leadership Experience

Trip Leader & Secretary — UTK Canoe and Hiking Club — 2024–2026

- Led large group backpacking trips (~25 participants): route planning, permits, transportation, communications, and safety briefings.
- On-trail leadership: navigation, incident triage, and schedule management.

Biology 101 Tutor — Thornton Center Aug–Nov 2025

- One-on-one and small-group instruction for student athletes.

Invasives & Restoration Team Member — US Forest Service May–Aug 2024

- Conducted ecological surveys and data collection for invasive species monitoring.
- Sprayed herbicide along remote FS roads for invasive plant control.

Technical Skills

Programming & OS: Python, R, Java, Linux (WSL, Ubuntu), Git, Conda.

Computational Biophysics: Docking (Boltz, AutoDock Vina); scientific visualization (ChimeraX, Discovery Studio).

AI Tools: OpenAI Codex CLI; generally proficient in collaboration with LLMs.

Laboratory / Analysis: Basic familiarity with lab and statistical techniques; basic proficiency in Excel.

Awards & Honors

National Merit Finalist, 2022.

University of Tennessee: Dean's List (Fall 2023, Spring 2024, Fall 2024, Spring 2025).

University of Arizona: Dean's List with Distinction (Fall 2022, Spring 2023); First Level Honors (Spring 2023); Academic Year Distinction Award (2023).

Last updated: November 7, 2025