

Beau J. Lonnquist

5482 NW Primino Ave Portland, OR, 97229
503-332-5579 / blonn25@uw.edu / linkedin.com/in/beau-lonnquist

EDUCATION

University of California San Francisco, San Francisco, CA
PhD, Biophysics

Entering: September 2025

University of Washington, Seattle, WA
BS, Bioengineering (Data Science Option)
GPA: 3.98/4.00

Expected: June 2025

Research Advisor: Prof. David Baker

Senior Capstone Thesis: Computational Design of Highly Effective *de novo* Transcription Factors

RESEARCH & INDUSTRY EXPERIENCE

Baker Lab, Institute for Protein Design, University of Washington

Seattle, WA

Undergraduate Researcher

Aug. 2023–Present

- Design *de novo* DNA-bending repressors to investigate the role of DNA bending in bacterial transcription
- Develop matrix-based Python scripts to facilitate homo-oligomer design and generate bent DNA structures
- Optimizing LigandMPNN by encoding explicit hydrogen bonds to improve designed protein-ligand interactions

Summer Research Program Fellow

June 2023–Aug. 2023

- Designed *de novo* repression-inducing transcription factors using RFdiffusion, ProteinMPNN, and AlphaFold2
- Applied PyMOL and PyRosetta scripting to compute multiple variations of RMSD to score designed proteins
- Performed PCR, Golden Gate assembly, and flow cytometry to measure fold-repression of designs in *E. coli*

Multi-Quarter Research Program Fellow

Sept. 2022–June 2023

- Employed machine learning and physics-based methods to design sequence-specific DNA-binding proteins
- Wrote Python and Bash scripts to manipulate molecular structures, calculate metrics, and perform data analysis
- Characterized DNA-binding proteins with yeast display and FACS to assess binding specificity and affinity

Genentech—A Member of the Roche Group

Hillsboro, OR

Cell Therapy Process Engineering Intern

June 2024–Sept. 2024

- Automated stem cell therapy processes with VBA to streamline manufacturing and meet cGMP requirements
- Configured alarms to support bioreactor-driven cell expansion, monitor processes, and minimize product loss
- Conducted exploratory stem cell expansion and differentiation studies to optimize the manufacturing process

Computer-Aided Drug Discovery (Internship Side-Project)

June 2024–Sept. 2024

- Screened millions of cancer drug leads using Schrödinger Glide and OpenEye HYBRID docking software
- Prepared high quality protein and ligand structures for screening using Python, Bash and Schrödinger Maestro
- Applied foundational medicinal chemistry principles to identify unusual intermolecular interactions playing essential roles in protein-ligand binding

HuskyADAPT, Department of Mechanical Engineering, University of Washington

Seattle, WA

Research & Development Engineer

Sept. 2021–June 2022

- Designed a device that enabled individuals with impaired motor functions to autonomously play card games
- Engineered modular 3D-printed and laser-cut components and optimized through iterative design
- Assessed the structural and electrical reliability of 3 different prototypes through rigorous and diverse testing

TEACHING & MENTORSHIP EXPERIENCE

Department of Bioengineering, University of Washington

Seattle, WA

Teaching Assistant, Biochemical & Molecular Engineering

Mar. 2024–Present

- Support 100 students through office hours, review sessions, and answering questions via Canvas and Piazza
- Develop curricula and lead lectures on molecular analysis and visualization using PyMOL and Chimera
- Grade assignments and exams to assess student learning, and inform potential teaching adjustments

Baker Lab, Institute for Protein Design, University of Washington**Seattle, WA***Multi-Quarter Research Program Mentor**Sept. 2023–Present*

- Mentor 10 undergraduate students in designing de novo DNA-binding proteins using machine learning
- Develop students' computational and experimental skills in group meetings, office hours, and wet lab sessions
- Design template code to assist students in learning the fundamentals of programming for protein design

Students Tutor Students**Virtual***Volunteer Mathematics Tutor**Mar. 2020–Present*

- Provide weekly individualized tutoring for 2 students ages 9 and 13 to support learning and content retainment
- Create specialized worksheets and lessons catered to each child's learning style to improve understanding
- Maintain an encouraging and patient demeanor to boost child confidence and overcome challenging topics

College of Engineering, University of Washington**Seattle, WA***Engineering Peer Educator**Mar. 2022–Mar. 2024*

- Instructed two 11-week classes of 25 first year engineering students in foundational skills for higher education
- Crafted and executed engaging lesson plans on academic success, engineering skills, and career planning
- Communicated with administrators to provide accurate and timely support to address unique student needs

University of Washington / Chehalis Foundation Summer STEM Camp**Chehalis, WA***Science and Engineering Camp Instructor**Aug. 2023*

- Collaborated with Ph.D. and postdoc scholars to create protein design curricula for 70 high school students
- Presented high-level machine learning and protein energetics keynotes to introduce core design principles
- Led Google Colab simulations and a tangible protein design activity to emphasize key biochemistry concepts

LEADERSHIP & COMMUNITY OUTREACH**Biomedical Engineering Society, University of Washington****Seattle, WA***Mentorship Chair**June 2024–Present*

- Facilitate a program connecting over 100 mentees with mentors to provide academic and career mentorship
- Organize quarterly events to provide students networking, mentorship, and career exploration opportunities
- Support outreach efforts on-campus and in local communities that promote BioE to college and K-12 students

Husky Triathlon Club, University of Washington**Seattle, WA***Club Officer**June 2022–June 2024*

- Managed club data and information for over 30 athletes to keep team records and insurance up to date
- Created and maintained a team website to serve as a centralized location for team info and accomplishments
- Assisted in organizing and executing an indoor triathlon for over 75 participants and fundraising over \$2500

Triangle STEM Fraternity, University of Washington**Seattle, WA***Vice President**Feb. 2022–Feb. 2024*

- Led a fraternity of over 30 students managing internal affairs and ensuring compliance with national standards
- Coordinated 8 recruitment events and 20 interviews that increased the chapter size by 50% in just 2 weeks
- Represented the chapter in communications with Greek organizations, clubs, and the College of Engineering

PUBLICATIONS

- [1] C. J. Glasscock, R. Pecoraro, R. McHugh, L. A. Doyle, W. Chen, O. Boivin, **B. Lonnquist**, E. Na, Y. Politanska, H. K. Haddox, D. Cox, C. Norn, B. Coventry, I. Goreshnik, D. Vafeados, G. R. Lee, R. Gordon, B. L. Stoddard, F. DiMaio, and D. Baker, "Computational design of sequence-specific DNA-binding proteins," *bioRxiv*, 2023, doi:10.1101/2023.09.20.558720 (Submitted to *Nat. Struct. Mol. Biol.*).

PRESENTATIONS

- [8] B. Lonnquist, C. J. Glasscock, and D. Baker, "Bending the Rules: de novo Transcription Factor Design for Targeted Gene Regulation," **Engineering Biology Research Consortium (EBRC) Annual Meeting**, Seattle, WA, 2025 (Poster).

- [7] B. Lonnquist, C. J. Glasscock, and D. Baker, "Computational Design of *de novo* Transcription Factors as Novel Gene Therapies," **Gulf Coast Undergraduate Research Symposium (GCURS) at Rice University**, Houston, TX, 2024 (Keynote).
- [6] B. Lonnquist, A. Gonzalez, and D. Slater, "Streamlining Stem Cell Therapy Manufacturing: Automated Approaches to Bioreactor-driven Stem Cell Expansion," **Genentech Annual Intern Poster Day**, Hillsboro, OR, 2024 (Poster).
- [5] B. Lonnquist, C. J. Glasscock, and D. Baker, "Synthetic Transcription Factors and Other Stories in Protein Science," **Genentech Hillsboro Innovative Therapies Lunch & Learn**, Hillsboro, OR, 2024 (Keynote).
- [4] B. Lonnquist, C. J. Glasscock, and D. Baker, "Computational Design of *de novo* DNA-binding Homodimers for Genetic Manipulation," **The Protein Society's 38th Annual Symposium**, Vancouver, BC, 2024 (Poster).
- [3] B. Lonnquist, C. J. Glasscock, and D. Baker, "Computational Design of *de novo* DNA-binding Homodimers for Genetic Manipulation," **UW Annual Undergraduate Research Symposium**, Seattle, WA, 2024 (Poster).
- [2] B. Lonnquist, C. J. Glasscock, R. Pecoraro, and D. Baker, "Unlocking Genetic Regulation: *de novo* DNA-binding Homodimers," **UW Summer Research Symposium**, Seattle, WA, 2023 (Poster).
- [1] B. Lonnquist, A. Lin, Z. Isley, S. Janakiraman, D. Nguyen, and K. Borgia, "Designing an Accessible Device for Card Games," **UW Center for Research and Education on Accessible Technology and Experiences (CREATE) Showcase**, Seattle, WA, 2022 (Keynote & Poster).

HONORS & AWARDS

NSF Graduate Research Fellowship Program Award National Science Foundation	Apr. 2025
College of Engineering Dean's Medal Nominee UW Department of Bioengineering	Mar. 2025
Best Presentation in Biomedical Research GCURS at Rice University	Nov. 2024
Chemical and Biomolecular Engineering Travel Grant GCURS at Rice University	Nov. 2024
Washington Research Foundation Fellowship UW Office of Undergraduate Research	Sept. 2024
Hoffman Endowed Scholarship UW Department of Bioengineering	Aug. 2024
Undergraduate Poster Competition Winner The Protein Society's 38th Annual Symposium	July 2024
Homi Kapadia Scholarship Triangle Education Foundation	June 2024
Second Place, Jody Deering Nyquist Speech Contest UW Department of Communication	June 2024
Outstanding Engineering Peer Educator of the Year UW College of Engineering	Dec. 2023
Levinson Emerging Scholar Fellowship UW Office of Undergraduate Research	Sept. 2023
Emerging Leader in Engineering UW College of Engineering	Sept. 2023
James Rust Scholarship Triangle Education Foundation	July 2023
Stratos-Stephan Endowed Scholarship UW Department of Bioengineering	July 2023
Summer Research Program Fellow Institute for Protein Design at the UW	June 2023
Edward J. Ammer Jr. Endowed Scholarship UW College of Engineering	Sept. 2022
Multi-Quarter Research Program Fellow Institute for Protein Design at the UW	Aug. 2022
Andy Grove Scholarship Intel Corporation	Apr. 2022
Purple and Gold Scholarship UW College of Engineering	Sept. 2021
Balanced Man Scholarship Semifinalist Sigma Phi Epsilon at UW	Sept. 2021
Cherie Pun Memorial Scholarship Jacob Wismer Elementary School	June 2021