

# GIO KIM

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## EDUCATION

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**Eastlake High School — Sammamish, WA | Freshman (Class of 2029)** Sep 2025 – Jun 2029

- Coursework: Honors Biology, Honors Chemistry, Honors English 10, UW Precalculus Math 120, Spanish 2, History/Health, Band

## RESEARCH & PROJECTS

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**WebLLM — Browser-Based Vision-Language Model Chrome Extension** Jun 2026

- Built a Chrome extension running a vision-language model (Gemma) entirely client-side via WebGPU/ONNX Runtime, enabling on-screen visual Q&A and text chat with no backend server
- Architected Manifest V3 system with offscreen-document runtime, adaptive image compression and resolution tiering, and token-by-token streaming inference; designed for full local privacy (no telemetry, no persisted prompts or screenshots)

**Protein Sequence Transformer (Evo-Biased Sequence Generator)** Jun 2026

- Developed a Transformer-based autoregressive language model in PyTorch to generate protein-like amino acid sequences for the LuxR regulatory protein family, incorporating a learned pairwise interaction bias between sequence positions
- Trained on bacterial regulatory protein sequences retrieved from UniProt with fallback datasets; built heuristic ranking system for generated sequence outputs

**Simplified Kinetic Modeling and Parameter Optimization of the RhII/RhIR Quorum Sensing System from Pseudomonas aeruginosa Using Tellurium** May 2026

- Developed reaction-based systems biology model of the RhIR/RhII quorum sensing pathway using Tellurium and Hill-function kinetics
- Investigated positive-feedback-driven signal amplification through simulations of C4-HSL production, receptor binding, and degradation dynamics; published full computational analysis and findings on cellsandcivics.org

**Structural Prediction of LasR LBD–QsIA Complex (P. aeruginosa)** Mar 2026

- Predicted 3D structure of LasR ligand binding domain QsIA complex using AlphaFold2
- Analyzed structural features relevant to dimerization and ligand binding in QS regulation using ChimeraX; published on cellsandcivics.org

**Structural Prediction of Babesia bovis HAP2 Protein** Mar 2026

- Predicted full length HAP2 via AlphaFold2; aligned against published ectodomain data (Rahman et al.), RMSD = 1.263 Å
- Analyzed conservation of membrane fusion motifs under ~27% sequence identity; published with full writeup on cellsandcivics.org

**Breast Cancer CNN Classifier** Aug 2025

- Built benign/malignant image classifier in PyTorch with augmentation pipeline, CrossEntropyLoss, and Adam optimizer

**Jarvis — Local LLM Automation System** Nov 2025 – Present

- Built Python/PowerShell LLM-driven OS automation system with multi model council orchestration layer to evaluate actions before execution

**Cells and Civics (cellsandcivics.org)** Dec 2025 – Present

- Founded personal research platform publishing computational biology studies, AlphaFold structural analyses, and literature reviews on microbiology

**Freelance Web Developer** Dec 2025 – Present

- Designed and developed websites for 4+ nonprofit organizations
- Built and deployed full websites handling design, content structure, and implementation independently

## RESEARCH EXPOSURE

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**Lab & Institute Tours — University of Washington** 2025 – 2026

- Institute for Protein Design (IPD): toured active protein engineering and computational design facilities
- Institute for Stem Cell and Regenerative Medicine (ISCRM): observed regenerative medicine and cell biology research environments

- Clean Energy Institute (CEI): explored batteries and future clean energies
- Incoming Research Assistant: Dandekar Lab, UW (Summer 2027)

## **AWARDS & HONORS**

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- USACO Gold Division — Perfect scores in Bronze and Silver; advanced to Gold as a freshman — Feb 2026
- ACSL All Star Finals Qualifier — May 2026
- John Locke Institute Essay Competition — Commendation; top 16% of global applicants — Oct 2025
- King County Model United Nations — Best Delegate — Apr 2026
- Harvard AI Bootcamp — High Distinction — Aug 2025
- Health Occupations Students of America — State Qualifier — Feb 2026

## **CERTIFICATIONS**

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- Lifeguarding (Including Deep Water) with CPR/AED for Professional Rescuers and First Aid

## **LEADERSHIP**

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**Computational Biology Club, Eastlake High School — Founder (Planned)** Sep 2027 – Present

- Planning to create the first computational biology club at Eastlake High School in sophomore year

**EduMUN — Assistant Director** Feb 2026 – Oct 2027

- Working with Director and Chair in creation and management of a Model United Nations Committee

**KORE — Director of Outreach** Jan 2025 – Apr 2026

**F1 Club — Secretariat** Oct 2025 – Jun 2026

## **ACTIVITIES**

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- USACO Competitor
- ACSL Competitor
- Technology Student Association
- Health Occupations Students of America
- DECA Competitor
- Speech and Debate
- Science National Honor Society
- Math National Honor Society
- Sammamish Independent Student Reporter
- Model United Nations
- Clarinet Player

## **TECHNICAL SKILLS**

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- Programming: Python, Java, R
- Tellurium
- ML/Bio: PyTorch, AlphaFold2, ChimeraX
- Wet Lab: PCR, Microscopy, Pipetting
- Analytical writing