

# AARNAV SAREEN

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## EDUCATION

**Grover Cleveland Charter High School** — Humanities Magnet, Los Angeles, CA

**Expected June 2027**

Weighted GPA 4.66 · AP Calculus BC: 5 (AB Subscore: 5)

## RESEARCH EXPERIENCE

**Board of Governors Regenerative Medicine Institute**, Cedars-Sinai Medical Center

June 2026 – Present

*Research Intern, Ho Laboratory — CIRM SPARK Program | Mentors: Ken Ning; Ritchie Ho, PhD*

**Manuscript:** “Epigenetic Regulation of Caudal Motor Neuron Identity by PRC2 Inhibition in Human iPSC-Derived Motor Neuron Progenitors” (In Preparation)

- Investigated how Polycomb Repressive Complex 2 (PRC2) gates rostrocaudal HOX patterning in human iPSC-derived motor neurons, testing four epigenetic inhibitors across six age-matched, sex-balanced donor lines.
- Executed end-to-end RT-qPCR workflows — RNA extraction, cDNA synthesis, plate design, and  $\Delta\Delta C_t$  analysis normalized to GAPDH — quantifying six caudal HOX genes and five motor neuron identity markers.
- Performed SDS-PAGE and Western blotting (H3K27me3, H3, EZH2, OLIG2,  $\beta$ -actin) with ChemiDoc imaging, establishing that PRC2 inhibition reduces global H3K27me3 in motor neuron progenitors.
- Stained and imaged multichannel immunofluorescence panels (H3K27me3, OLIG2, SMI32, HOXC9, HOXC10) by confocal and widefield microscopy; processed and quantified signal in ImageJ/Fiji.
- Ran a six-condition retinoid-depletion matrix ( $\pm$  vitamin A,  $\pm$  all-trans retinoic acid,  $\pm$  PRC2 inhibition), showing caudal HOX induction requires both exogenous and ALDH1A2-derived retinoic acid.
- Interpreted VST-normalized bulk RNA-seq alongside qPCR to identify PRC2-dependent remodeling of the retinoid network, working independently on daily experiments with weekly mentor review.
- Authored the project abstract and built a five-figure poster from raw data; presented weekly progress in lab meeting and journal club.

**Independent Computational Research Project** — Faculty-Mentored, Remote

April 2026 – Present

*Student Researcher — Automated Quantification of Microvilli Morphology in SEM Images*

**Manuscript:** “Quantitative Morphometric Analysis of Microvilli Phenotypes Using Scanning Electron Microscopy” (In Preparation)

- Building a reproducible ImageJ/Fiji pipeline to quantify microvilli morphology in scanning electron micrographs of retinal pigment epithelium, replacing manual scoring with standardized texture measurements.
- Wrote two ImageJ macros that batch-process image folders end to end — metadata cropping, Gaussian-division background normalization, contrast enhancement, rolling-ball subtraction, median filtering — exporting intensity, skewness, and kurtosis metrics to CSV for whole images and manually drawn ROIs.
- Developed a companion Python script (pandas, NumPy, SciPy, statsmodels) that screens each metric with Shapiro-Wilk and Levene’s tests, then routes it to ANOVA with Tukey post hoc or Kruskal-Wallis with Holm-adjusted Dunn, reporting effect sizes.
- Applied the pipeline to roughly 100 images across three datasets and four morphology classes; analysis is ongoing, with current work focused on per-session normalization before results are interpreted.
- Review methodology, statistical choices, and figures with a research mentor weekly; maintain versioned documentation of protocols, datasets, and analysis decisions.

## RESEARCH PRESENTATIONS

Sareen A, Ning K, Tindel I, Singh BK, Zogu B, Ho R. “PRC2-Mediated Chromatin Repression Gates Retinoic Acid-Dependent Caudal HOX Induction in iPSC-Derived Motor Neurons.”

- **Society for Neuroscience Annual Meeting (Neuroscience 2026)** — Washington, DC. Abstract accepted for poster presentation, November 14–18, 2026.
- **Cedars-Sinai Research Poster Symposium** — Los Angeles, CA. Institution-wide poster session, August 7, 2026.
- **CIRM SPARK Annual Conference** — University of California, Berkeley. Poster presentation to the statewide CIRM SPARK cohort, August 1, 2026.
- **Cedars-Sinai CIRM SPARK Research Symposium** — Los Angeles, CA. Poster presentation and judged Q&A with institute faculty, July 30, 2026.

## AWARDS & HONORS

**Abstract Accepted, Society for Neuroscience Annual Meeting** — Neuroscience 2026, Washington, DC

2026

**Most Valuable Player**, Boys Varsity Tennis — Grover Cleveland Charter High School

2025–26

**Most Valuable Player**, Boys Varsity Tennis — Grover Cleveland Charter High School

2024–25

**Singles Ladder Winner**, Boys Varsity Tennis — Grover Cleveland Charter High School

2025–26

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| <b>SPARK Certificate of Completion</b> — California Institute for Regenerative Medicine                   | 2026 |
| <b>SPARK Certificate of Completion</b> — Board of Governors Regenerative Medicine Institute, Cedars-Sinai | 2026 |

### LEADERSHIP & ATHLETICS

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| <b>Team Captain</b> , Boys Varsity Tennis — Grover Cleveland Charter High School                                                                                                                                                                                                                          | Jan 2026 – Present   |
| <ul style="list-style-type: none"> <li>Lead daily practices, set singles and doubles lineups, and coordinate match strategy across the competitive season.</li> <li>Mentor underclassmen on technique and match preparation and act as the primary liaison between players and coaching staff.</li> </ul> |                      |
| <b>Varsity Athlete</b> , Boys Varsity Tennis — Grover Cleveland Charter High School                                                                                                                                                                                                                       | Nov 2023 – Present   |
| <ul style="list-style-type: none"> <li>Three-year varsity competitor; earned Most Valuable Player in consecutive seasons and won the team singles ladder.</li> </ul>                                                                                                                                      |                      |
| <b>Class Representative</b> , Freshman Council — Grover Cleveland Charter High School                                                                                                                                                                                                                     | Aug 2023 – June 2024 |
| <ul style="list-style-type: none"> <li>Represented the freshman class in student government meetings and helped organize class events and school-wide initiatives.</li> </ul>                                                                                                                             |                      |

### COMMUNITY SERVICE

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| <b>Volunteer</b> , Normandie Avenue Seventh-day Adventist Church Food Program — Los Angeles, CA                                                                                                                                              | Sept 2025 – Present |
| <ul style="list-style-type: none"> <li>Assemble and distribute food packages to families across a range of income levels, manage donation intake and sorting, and support recurring operations that reduce local food insecurity.</li> </ul> |                     |
| <b>Volunteer</b> , Cedars-Sinai Medical Center Annual Holiday Event — Los Angeles, CA                                                                                                                                                        | Dec 2024            |
| <ul style="list-style-type: none"> <li>Distributed meals and refreshments to patients, families, and hospital staff during the medical center’s annual holiday program.</li> </ul>                                                           |                     |
| <b>Volunteer Tutor &amp; Youth Tennis Coach</b> — Los Angeles, CA                                                                                                                                                                            | Ongoing             |
| <ul style="list-style-type: none"> <li>Coach younger players on stroke mechanics and match strategy and tutor students in writing and essay structure.</li> </ul>                                                                            |                     |

### ADDITIONAL EXPERIENCE

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| <b>Amgen Biotechnology Summer Program</b> — Thousand Oaks, CA                                                                                                                                                                                                                                                                                                                                             | July 2024 |
| <i>Student Participant</i>                                                                                                                                                                                                                                                                                                                                                                                |           |
| <ul style="list-style-type: none"> <li>Toured research laboratories and manufacturing facilities to study how a therapeutic moves from discovery to production, and examined applications of artificial intelligence to healthcare delivery and health equity.</li> <li>Developed and pitched a biotech business model with a student team, presenting to Amgen scientists and business staff.</li> </ul> |           |

### ACTIVITIES & INVOLVEMENT

|                                                                                                                                                                            |                     |
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| <b>Investment Club</b> — Member, Grover Cleveland Charter High School                                                                                                      | Jan 2026 – Present  |
| <ul style="list-style-type: none"> <li>Analyze individual equities and market trends; study valuation fundamentals, index investing, and macroeconomic drivers.</li> </ul> |                     |
| <b>Rock and Roll History Club</b> — Member, Grover Cleveland Charter High School                                                                                           | Sept 2025 – Present |
| <ul style="list-style-type: none"> <li>Examine the cultural and historical impact of popular music through discussion-based projects and presentations.</li> </ul>         |                     |

### RESEARCH SKILLS

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| <b>Laboratory:</b> iPSC culture and motor neuron differentiation; sterile technique; RT-qPCR (RNA extraction, cDNA synthesis, ΔΔCt); SDS-PAGE and Western blotting; immunofluorescence staining; agarose gel electrophoresis |
| <b>Imaging &amp; Analysis:</b> Confocal and widefield fluorescence microscopy; ImageJ/Fiji; ChemiDoc; GraphPad Prism; bulk RNA-seq interpretation; Python                                                                    |
| <b>Scientific Communication:</b> Abstract writing; poster design; primary-literature journal club; defending results to faculty judges                                                                                       |

### TECHNICAL SKILLS & PROJECTS

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| <b>Programming:</b> Python (pandas, NumPy, SciPy, statsmodels, Matplotlib), ImageJ Macro Language, C#, C / RobotC                                     |
| <b>Image Analysis:</b> ImageJ/Fiji macro scripting; automated batch preprocessing pipelines; ROI-based quantification                                 |
| <b>Statistics:</b> Shapiro-Wilk and Levene’s screening; ANOVA/Tukey; Kruskal-Wallis/Dunn; effect sizes ( $\eta^2$ , $\epsilon^2$ , Cliff’s $\delta$ ) |
| <b>Software:</b> GraphPad Prism, Microsoft Excel, Word, and PowerPoint                                                                                |
| <b>Robotics:</b> Design, build, and program robots in C-based languages to complete autonomous missions.                                              |

### INTERESTS

Photography · Long-term investing and market analysis · Hiking and biking · Reading · Learning new languages