RRIDHISHA KUMAR

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EDUCATION

Sep 2020 - Jun 2024 • University of California, San Diego

- Bachelor of Science in **Bioengineering: Biotechnology**
- Cumulative GPA (4.0 scale): **3.922,** Major GPA: **3.95**

Relevant Courses

- Genetics, Biomolecular Engineering, Dynamic Simulations, Modeling & Computation in Bioengineering, Biomaterials Design, Cell & Tissue Engineering, Bioreactor Engineering, Biotechnology Laboratory

SOFTWARE SKILLS

MATLAB	Arduino
Python	Fiji ImageJ
Microsoft Excel	Adobe Illustrator

LABORATORY SKILLS

Gas Chromatography-Mass Spectrometry (GC-MS), Next-Generation Sequencing, Adaptive Laboratory Evolution (ALE), Bacterial Transformations

LANGUAGES

English, Hindi	Native
French	Proficient

RESEARCH EXPERIENCE

Yo Suzuki Lab, J. Craig Venter Institute (JCVI) — **Apr 2023 - Current**

Research Associate — ***San Diego, CA***

- Leading a project to integrate a carbon fixation pathway into the *Syn3B* Minimal Cell, and training 5 senior design students on lab processes like Gibson assembly, cell culture, and programming the Opentrons robot.
- Developing a biofuel production system in cyanobacteria, optimizing the workflow of GC-MS detection and analysis, and presenting our data to collaborators at Honda.
- Building tools for biocontainment in *P.putida* with the National Renewable Energy Lab, including an inducible repression system and and a streamlined protocol for Combinatorial Genetics En Mass (CombiGEM).

Lingyan Shi Lab, UC San Diego — **Nov 2022 - Jun 2023**

Undergraduate Researcher — ***San Diego, CA***

- Utilized Spectral tracing of deuterium (STRIDE) and Raman scattering microscopy (SRS) to test the effect of degrading protease activity on insulin receptors and their regeneration.
- Analyzed the fluorescence of deuterium-labelled glucose molecules in mouse embryonic fibroblast cells using ImageJ, and complied the findings in a report and a presentation as part of the Faculty Mentorship Program.

Emily Troemel Lab, UC San Diego — **Apr 2022 - Jan 2023**

Laboratory Assistant — ***San Diego, CA***

- Facilitated researchers studying pathogen interactions in *C.elegans* by preparing materials necessary for their studies and performing lab maintenance to significantly improve the efficiency of experiments conducted.
- Optimized procedures such as preparing reagents, pouring hundreds of plates at once, and making stocks of bacterial 'superfood' for the *C.elegans.*

Bioengineering Department Internship at UC San Diego — **Sept 2021 - Jan 2022**

Biological Data Interpretor — **San Diego, CA**

- Collaborated with the Novo Nordisk Foundation Center for Biosustainability to analyze genetic data from patients suffering from sepsis and discuss potential therapeutic targets.
- Performed literature reviews to enhance the interpretability of the results and presented the findings using Lifelike, a proprietary platform that uses artificial intelligence to create interactive knowledge graphs.

LEADERSHIP EXPERIENCE

Oct 2024 - Current — **Mentor Collective at UC San Diego**

- Mentoring 5 freshman year students and sharing my experiences to help them navigate challenges at UCSD and recognize academic opportunities.

Apr 2023 - Jun 2024 — **President of International Genetically Engineered Machine (iGEM) @ UC San Diego**

- Created an official organization for UCSD students to annually compete in the iGEM competition.
- Managed tasks for the JCVI-UCSD project- MACS: the Minimal, Adaptive Carbon Sequestration cell, and divided assignments between our team of 10 people.
- Designed visuals for our website, directed the promotional video, fundraised over $10K, and ran experiments.

Jan 2023 - Jun 2024 — **Vice President Internal of Tau Beta Pi: The Engineering Honor Society**

- Invited to join Tau Beta Pi as an engineering student in the top 1/8th of the Junior standing class.
- Elected as Vice President and took charge of recruiting eligible candidates and organizing the initiation ceremony.
- Spearheaded outreach to female students and increased the board ratio from 20% to 50% women.

AWARDS

Jun 2024	**Recipient of Cum Laude Honors**
Jun 2020 - 2024	**Provost's Honors (All quarters)**
November 2023	**$1200 Travel Award from UC San Diego for the iGEM Competition**
November 2023	**iGEM Jamboree Silver Medal**
	Top 10 Undergraduate Presentation Award
April 2023	**Winner of UC San Diego's Annual BioTechathalon (Awarded $300)**
	• Nanoclear: a 2-step approach to address Alzheimer's disease using GSH responsive silica nanocapsules and CRISPR-Cas9.
April 2022	**Winner of UC San Diego's Annual BioTechathalon (Awarded $300)**
	• DNA-based universal influenza vaccine with a lasting immune response & memory against strains.

PRESENTATIONS

***Presenting author**

Dec 9, 2024	**International SynBYSS Conference at University of Hawai'i**
Poster Presentation	• "Establishing a Novel Ligand-Inducible Repression System in Pseudomonas putida using the Escherichia coli Transcriptional Regulator NikR"
	• Ayako Murao, Diana Hernandez, **Rridhisha Kumar**, Christopher W. Johnson, Michael T. Guarnieri, Yo Suzuki
Oct 24, 2024	**2024 BMES Annual Meeting at Johns Hopkins University**
Poster Presentation	• "Development of an In Vivo Carbon Fixation System in the Syn3B Minimal Cell"
	• **Rridhisha Kumar***, Myra Ashraf, Parisa Shahabi, Sarah Chittle, Ella Kirwan, Yan Zhe Liu, Aishwarya Mitra, Amit Klein, Andrew Nguyen, Neel Dhar, John Glass, Immo Burkhardt, Yo Suzuki
Oct 2, 2024	**4th Minimal Cell Workshop at J. Craig Venter Institute**
Talk	• "Insertion of a Minimal Carbon Sequestration Pathway into the JCVI Minimal Cell"
	• **Rridhisha Kumar**
May 22, 2024	**Bioengineering Day at UC San Diego**
Poster Presentation	• "MACS: Minimal & Adapted Carbon Sequestration"
	• **Rridhisha Kumar***, Myra Ashraf*, Parisa Shahabi*, Sarah Chittle*, Ella Kirwan*, Yan Zhe Liu, Aishwarya Mitra, Amit Klein, Andrew Nguyen, Neel Dhar, John Glass, Immo Burkhardt, Yo Suzuki
Mar 29, 2024	**12th Build-a-Cell Workshop at J. Craig Venter Institute**
Poster Presentation	• "Assembling the POAP pathway in vivo using 2-Enzyme Designs and the JCVI Syn3B Minimal Cell"
	• **Rridhisha Kumar***, Myra Ashraf*, Parisa Shahabi*, Sarah Chittle, Ella Kirwan, Yan Zhe Liu, Aishwarya Mitra, Amit Klein, Andrew Nguyen, Neel Dhar, John Glass, Immo Burkhardt, Yo Suzuki
Nov 2-5, 2023	**iGEM 2023 Grand Jamboree in Paris, France**
Talk & Poster Presentation	• "MACS: Minimal & Adapted Carbon Sequestration"
	• Yan Zhe Liu*, Aishwarya Mitra*, Amit Klein*, Andrew Nguyen*, Neel Dhar*, **Rridhisha Kumar***, Myra Ashraf*, Sarah Chittle*, Parisa Shahabi*, Ella Kirwan*, John Glass, Immo Burkhardt, Yo Suzuki
Jun 4, 2023	**Online Undergraduate Research Symposium at UC San Diego**
Poster Presentation	• "STRIDE-SRS and 2PEF Imaging of Glucose Uptake Under Insulin Receptor Regulation"
	• Khang Hoang, Sirasit Prayotamornkul, Matthew Callahan, Alex Chung , Kyle Young, **Rridhisha Kumar*** Geert Schmid-Schoenbein, Lingyan Shi