ASDRP [NewsBytes]

Aspiring Scholars Directed Research Program

Week of March 1-7, 2025

Announcements, Shoutouts, and Accolades

Hexagon Bio Donations continue to pour into the on campus laboratories!

Dr. Edward Njoo and Akira Yamamoto continue to work hard in the laboratory on their research, with their student researchers AND obtain donations critical to world class research. Yesterday, Edward and Akira picked up two loads of supplies from Hexagon Bio in Menlo Park. Hardware and consumables are a significant component of keeping our laboratories running and operating smoothly. ASDRP continues our commitment to minimize wet and dry lab through a network of companies and non-profit organizations committed to the development of our young scientists. In addition to material donations, we encourage our families, friends and partners to continue to make financial donations.

Parents, Families and Friends of ASDRP can Donate - Any Time

Thank you to all of our families who helped us raise close to $75,000 in only 4 months this past fall. Our goal for 2025 is to double that and reach $150,000. Your generosity has a direct impact on student researchers and ASDRP's on campus and remote research teams. Many of our families utilize corporate matching benefits - thank you!

Financial donations can be made directly through our donation PayPal page. Options for one time and recurring donations are available. All donations are tax deductible and you can request that your donation be applied towards a specific laboratory. Check out donations webpage: www.asdrp.org/donations. If you need assistance, please contact David Linnevers @ david.linnevers@asdrp.org for more information.

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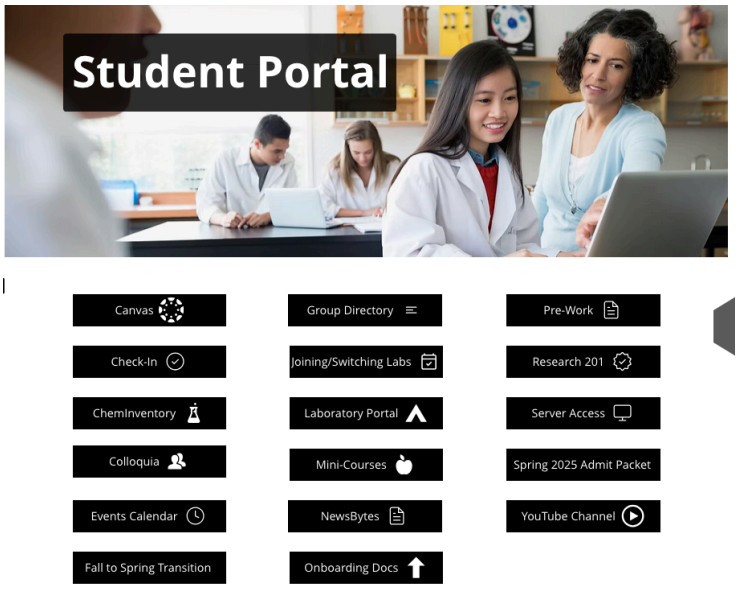
[Link to Public ASDRP Events Calendar]

The Student Portal

Take advantage of the resources available on the ASDRP Student Portal. One place to get access to: Event Calendar, Canvas, Joining/Switching Labs, Pre-work for new student researchers, Remote access to our server, Research 201 and our YouTube Channel..

If you do not have the password for the student portal, post a message on the Spring 2025 student google chat/spaces.



Research 101 and 201 are in FULL SWING!

This weekend is our sixth week of running this semester's rendition of Research 101, our foundations course for first semester students, and Research 201, our next-level advanced research methodology seminar for second and third semester students. This week in Research 101, Mr. Cunha will cover "Bias" as it refers to systematic errors that can skew research outcomes, leading to conclusions that deviate from the truth; "Statistical Analysis & Error" occurs when there's a discrepancy between the estimated values and the true population parameters. Understanding these practices addresses issues related to bias and statistical errors, leading to more trustworthy research and scientific outcomes.covered the importance of both rigorous preparation and documentation of standard operating procedures (SOP's) and documentation of electronic data to ensure reproducible research results.

In Research 201, this week our course instructors Dr. Larry McMahan and Dr. Edward Njoo finish up with the practical application of constructing a research proposal. The second installation of this two week long module will train students on developing and preparing an NSF-style mini-"proposal". This "proposal" might be a new direction of their PI's research, or it may not necessarily be a new research topic; rather, this "proposal" will summarize the research aims that they are already committed to within their research group.

Save the Date! ASDRP Research Expo & Symposium is March 22, 2025

*The **In Person** ASDRP Summer 2024 Semester Research Symposium and Expo showcases some of the original scientific findings of 1000+ high school student researchers who conducted*

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research across 200+ projects in a wide array of STEM fields. Students come from throughout the Bay Area, across the U.S., and internationally! The Symposium features students presenting the research they completed throughout the Fall 2024 & Spring 2025 semester and during their participation in ASDRP.

The Research Symposium & Expo showcases the students' novel results to their peers, parents, community, and friends. Importantly, these scientific projects conducted by students are original research with cutting-edge results, completed on $10M+ worth of donated research equipment with highly qualified research mentors, and are not traditional "science lab" projects whose results are known. This event is a premier opportunity for student researchers to be exposed to genuine research, scholarship, peer review, scientific reading and writing, and scientific presentation at a young age before college. At the completion of the Symposium, the students will be able to leverage their own published works in demonstrating their competitive advantage as they prepare to matriculate to college. We invite you to join us in the beginning of a wonderful journey for these young scientists. Please come, view research posters, ask the students questions, listen to oral presentations, support these great kids, celebrate their accomplishments, and have fun!

*The event is held at Mission College in Santa Clara. Mission College continues to be an incredible partner and allows the ASDRP community to utilize the Gillmor Center. The Gillmor Center is **118,000 square foot** three-story interdisciplinary classroom facility. A big thank you to Dr. Omar Murillo, Clement Lam, and Brian Shively who make our partnership with Mission College possible.*

On the Horizon: Upcoming Events

Saturday, March 1, 2025 @ 10:00 - 11:30 AM

Research 101, Week 6/Module 6: "Good Science: Bias, Error, and Statistical Analysis", Mr. Clinton Cunha

Research 101 is mandatory for all first semester students, and covers the fundamentals of research methodology, best practices, and basic statistics and writing skills. Module 6/Week 6, Mr. Cunha will cover "Bias" as it refers to systematic errors that can skew research outcomes, leading to conclusions that deviate from the truth; "Statistical Analysis & Error" occurs when there's a discrepancy between the estimated values and the true population parameters. Understanding these practices addresses issues related to bias and statistical errors, leading to more trustworthy research and scientific outcomes. Discussions will center around how, why and practical examples will be provided during the session. First Semester Students are required to join us at 10:00 AM PDT via Zoom.

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Saturday, March 1, 2025 @ 12:00 - 1:30 PM

Research 201, Week 6, Module 2 / Practical 2: "How to Write A Research Proposal", faculty-led

Module 2, Week 6 of Research 201 finishes up with the practical application of constructing a research proposal. The second installation of this two week long module will train students on developing and preparing an NSF-style mini-"proposal". This "proposal" might be a new direction of their PI's research, or it may not necessarily be a new research topic; rather, this "proposal" will summarize the research aims that they are already committed to within their research group. All second and third semester students are required to join us at noon on Zoom.

Saturday, March 1, 2025 @ 5:00 - 7:00 PM

Spring 2025 Guest Speaker: Dr. Madhulika Jupelli, Pfizer: ""Delivering a Functional Cure in a Pill for Sickle Cell Disease": *Sickle cell disease (SCD), also known as sickle cell anemia, refers to a group of inherited disorders that impact hemoglobin, the primary protein responsible for oxygen transport in red blood cells. In healthy individuals, red blood cells are flexible and disc-shaped, allowing them to flow easily through blood vessels. However, in SCD, the polymerization of hemoglobin S (HbS) leads to the formation of rigid, non-deformable sickle-shaped red blood cells. This loss of deformability, along with sickling and irreversible membrane damage, causes abnormal blood flow and increased blood viscosity. These factors contribute to Vaso-occlusion and a range of SCD-related complications, including pain, stroke, renal failure, cerebral infarction, lung problems, and infections. GBT021601 (generic name Osivelotor) is a second-generation anti-polymerization and anti-sickling agent currently in Phase III clinical trials for the treatment of SCD. This presentation will provide an overview of the drug's development, tracing its evolution from discovery through preclinical studies to its current status as a clinical candidate. In addition, we will examine data from in-vitro, ex-vivo, and in-vivo (animal) studies, demonstrating improvements in red blood cell biology, oxygen delivery, red blood cell membrane stability, and overall disease pathophysiology. The final portion of the talk will focus on the advantages of GBT021601 in reducing Vaso-occlusive crises, improving quality of life, and addressing the multifaceted nature of SCD.*

Madhulika Jupelli, MS, PhD

Where?
5:00 PM @ Seminar Room
Reception and Q&A Afterwards for In-Person Attendees

Saturday, March 1, 2025 @ 7:00 - 8:00 PM

Spring School Year Seminar: The Logic of Chemical Synthesis (Dr. Njoo) @ Seminar Room

This seminar meets on Saturday nights, with a focus on retrosynthetic analysis, strategies in atom- and step-economical total synthesis of natural products, and mechanistic study of named reactions. In person only, open to all students.

Monday, March 3, 2025 4:30 - 5:30 PM

Spring 2025 Core Training: NMR Spectroscopy Training (In Person Only)

Core trainings are required for students who wish to obtain clearance to operate capital research instrumentation, and may only be attended after completing all parts of safety training. In order to attend, students must complete the pre-quiz online on the Laboratory Practicum Canvas.

Tuesday, March 4,, 2025 @ 7:00 - 8:30 PM

Colloquia held online via Zoom (Weekly) Colloquia Website: www.asdrp.org/colloquia

- ★ *Starostina Lab "Mechanical properties evaluation of 3D printed PLA" - Diva Eashwer, American High School '26 and Hanming Zhao, Independence High School '25.*
- ★ *Starostina Lab "Interfacial Free energy Measurements Methods in Solids: Comparative Study" - Aansh Chopra, Washington High School '26; Siqi Feng, Basis Independent Silicon Valley '28; Darvas Gao, Washington High School*

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'25, Seoyeon Kim, Valley Christian High School '26; Gabriela Formanek, Notre Dame High School '26; Saahithi Srikanth, Monta Vista High School '27; Larry Xie, Milpitas High School '27; Phinna Yin, Washington High School '26

★ *McMahana Lab "AVX" - Haramrit Bal, Mountain House High School '27, Xiangtuo Cui, Basis Independent Silicon Valley '26; Rohan Devnani, Emerald High School '27; Trung Duong Evergreen Valley High School '25; Komal Jasuja, Weston High School (WA) '27; Christon Rex, California High School '28*

Join us every Tuesday at 7:00 PM on Zoom for the ASDRP student researchers Colloquia. All are invited and student researchers need to attend. **Zoom Link**

Thursday, March 6, 2025 4:30 - 5:30 PM

Spring 2025 Core Training: Cell Culture (In Person Only) - Dr. Zane Chen / Dr. Edward Njoo

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Friday, March 7, 2025 @ 6:00 - 7:00 PM

Spring 2025 School Year Seminar: "On the Importance of Data Curation" Prof. Robert Downing

*With the increasing public access to [very] large datasets, for all purposes, it is become imperative that someone in the inbound data stream has to make decisions, some of them very important, on the *exact* low-level modifications that have to be made. This is further compounded by external attempts to import data without it being validated. Here, we'll discuss how to perform this critical task, & why its uninteresting name guarantees there will be opportunities for anyone that can perform these tasks.*

Join us on Google Meet.

Saturday, March 8, 2025 @ 10:00 - 11:30 AM

Research 101, Week 7/Module 7: "Parts of a Paper, The Peer Review Publication Process", Mr. Amadi

Research 101 is mandatory for all first semester students, and covers the fundamentals of research methodology, best practices, and basic statistics and writing skills. Module 7/Week 4, Mr. Amadi will cover a critical component to excellence in research and publication - the Peer Review Process. Many of our student researchers want to publish and publishing a rigorous scientific study takes determination, excellent writing, repeatable scientific experiments and high quality data. Understanding peer review critique and the peer review publication submission requirements will help our students move closer to their dream of publishing. Discussions will center around how, why and practical examples will be provided during the session. First Semester Students are required to join us at 10:00 AM PDT via Zoom.

Saturday, March 8, 2025 @ 12:00 - 1:30 PM

Research 201, Week 7, Module 3 / Lecture 3: "Developing and Delivering a Research Plan", faculty-led

Module 3, Week 7, Lecture 3 of Research 201 kicks off up with tIdentifying a feasibility plan and direct actionable steps towards accomplishing the research goals outlined in Module 2. This is by nature highly discipline specific, and will challenge students to identify how the ultimate goals of a research project should be approached and eventually realized. While a lot of this discussion may already exist within individual research groups, the aim of this is to have students articulate and fully understand specific actionables and the chosen techniques to accomplish the targeted research. Once students have identified the background, rationale, and aims of their area of research within their advisor's group, the next skill they must build is developing a stepwise plan on short-term and long-term goals, as well as the feasibility and resources required for such goals, in order to achieve their research aims. All second and third semester students are required to join us at noon on Zoom.

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End Note

Memories of SCCUR 2024 at California State University, San Bernardino. Dr. Poudyal, (center) and his student research team.

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