The 2024 Science Olympiad Alumni Research (SOAR) Grant $10,000 Award Winner for Medical Research Impacting Human Health

Ravi Bandaru
Northwestern University
Department of Biochemistry and Molecular Genetics

Ravi Bandaru is a Research Data Analyst at The Simpson Querrey Institute for Epigenetics at Northwestern University's Feinberg School of Medicine. A 2022 Science Olympiad National Tournament champion from Mason High School, Ravi completed his undergraduate degree in 15 months while also serving as a lab fellow at Penn State University.

His current work seeks to utilize circulating cell-free DNA (cfDNA) fragmentation patterns as a predictive tool for addressing immunotherapy response in patients with head and neck cancers. Despite advances in treatment protocols, response rates remain low while recurrence remains high.

Ravi's advisor, Dr. Yaping Liu, explains: "Given the importance of epigenetics in gene regulation and the limitations of current technologies, Ravi's work addresses significant gaps in the field. He innovatively applied a state-of-the-art transformer model – central to the technology behind chatGPT – to his biomedical research challenge. Ravi's groundbreaking work has potential applications in predicting responses to immunotherapy in head and neck cancer, addressing major clinical challenges."

Next steps for Ravi include medical school in Pennsylvania and a published paper on a cfDNA computational tool.

The 2024 Science Olympiad Alumni Research (SOAR) Grant $10,000 Award Winner for Climate/Energy Research Impacting a Safer, Greener World

Jolly Patro
Northwestern University
Department of Chemistry

Jolly Patro is finishing her first year of a Chemistry PhD program at Northwestern University. A Science Olympiad Heart of Gold winner and National Tournament Co-Director, Jolly continues her love of community service through an NSF Center for the Chemistry of Molecularly Optimized Networks (MONET) grant, providing hands-on activities to students on Chicago's southwest side. She credits Science Olympiad with giving students a "platform to learn how to research topics and teach themselves foundational and practical topics in STEM."

Jolly's work addressing the plastics pollution crisis connects two emerging fields: polymer mechanochemistry and covalent adaptable networks (CANs). Plastics traditionally contain chemicals that are joined by high-strength bonds; by strategically placing weak bonds inside plastics, Jolly hopes to develop a novel material which is damage detecting and reprocessable.

"Jolly's proposal is a brilliant and creative way to both increase the impact of mechanophores and extend the lifetime of materials through self-healing and reprocessing," said Dr. Julia Kalow, Associate Professor of Chemistry at Northwestern University. Jolly will be first author on a soon-to-be-submitted manuscript on synthetic chemistry.

The Science Olympiad USA Foundation is a nonprofit organization founded in 2020, dedicated to carrying out the charitable, educational and scientific purposes of Science Olympiad, Inc., a nonprofit formed in 1984. ***This year, two first-place $25,000 SOAR Grants and two $10,000 runner-up SOAR Grants were awarded*** *in each category of medical research impacting human health and energy/climate research impacting a safer, greener world.*