

SHIVANI NATHAN

son242@eid.utexas.edu • (469) 512-5723

Interests: Chemical Engineering, Materials Science

Education

Plano West Senior High

GPA: 4.00 UW, 4.54 W
Class Rank: 32 out of 1341
36 ACT

May 2025

Research

Cellulose Extraction on Agricultural Crop Residues

August 2021 – March 2022

- Investigated effectiveness of agricultural crop wastes as alternatives to wood pulp in traditional chemical bleaching procedures
- Simulated industrial bleaching procedures and quantified degradation of lignin to determine resulting cellulose purity
- Determined that rice straw and corn husk residues showed greatest potential as alternates to wood pulp in purity and cellulose yield

Pleurotus ostreatus as an Alternative Method of Cellulose Extraction

August 2022 – May 2023

- Developed and analyzed a less chemically wasteful cellulose extraction process using white rot fungi
- Inoculated multiple agricultural crop residues with *Pleurotus ostreatus* spawn, then cultured for a span of two weeks
- Measured degradation of lignin using UV-VIS Spectrophotometry to determine cellulose purity
- Determined that *Pleurotus ostreatus* reaches similar levels of degradation to chemical bleaching, a 50% decrease in lignin, by a period of 14 days

The Effect of *Rhizophagus irregularis* on the Nutrient Uptake of *Glycine max*

August 2023 – May 2025

- Cultured *Rhizophagus irregularis* in *Glycine max* roots and analyzed nutrient intake
- Phosphorus content measured via dry ashing and Malachite green assay
- Plant phosphorus was found to increase with the addition of *Rhizophagus irregularis* in heavy metal contaminated (Aluminum, Nickel, and Manganese) and low-phosphorus soil when compared to the phosphorus levels of plants grown in uncontaminated soil with regular phosphorus content

Awards and Honors

- International Science and Engineering Fair Qualifier; 2023
- Presenter at the Texas Junior Science and Humanities Symposium; 2022-2023
- 3rd Place in Category at Texas Junior Academy of Sciences; 2021
- 2nd Place in Category at Texas Junior Academy of Sciences; 2024
- 3rd Place at Texas Science and Engineering Fair; 2022
- 1st Place at Dallas Regional Science and Engineering Fair; 2022-2024
- Scholastic Gold Key; 2023-2024
- State VASE (Visual Arts Scholastic Event) Qualifier; 2022, 2024
- State HOSA (Health Occupation Students of America) Qualifier; 2023
- 3rd Place at Dallas Symphonic Festival; 2024

Activities

National Honor Society – VP of Membership

May 2024 – May 2025

- Led meetings, organized and recorded volunteer hour submissions, and addressed emails for 800+ student members.
- Helped organize multiple donation drives, including the donation of 2,000+ pounds of food to North Texas Food Bank

Plano West LASER Club – Officer

October 2023 – May 2025

- Led afterschool meetings to share logistics regarding competition opportunities and project requirements
- Helped newer students with guidelines and passed on advice about the science fair process
- Served as a volunteer judge for younger divisions at the school level

Association for Young Scientists and Innovators – Marketing and Social Media Coordinator

August 2023 – May 2024

- Managed advertisement design and social media outreach for science fair workshops
- Researched and reached out to underprivileged schools for donation of \$7k in collected funds

Quiz Bowl – Officer

August 2022 – May 2023

- Led practices by reading question packets
- Oversaw communication channels and led recruitment for new members to the club
- Member of main team that qualified for NAQT, a national quiz bowl competition

National Art Honor Society

August 2022 – May 2025

- Participated in creating art for and setting up local art show
- Entered and won awards in art competitions on the state and national level

Skills

- **Laboratory Experience** – 4 years of independent research, experience with UV-VIS Spectrophotometry, safety procedures with corrosive and volatile chemicals
- **Public Speaking/Technical Writing/Reading** – 4 years of research paper writing and presentation experience through symposiums and fairs
- **Education** – 2 years of experience as an independent tutor