

# Soha Aggarwal

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## EDUCATION

### The Cathedral and John Connon School, Mumbai

- International Baccalaureate Diploma Program, Grade 12
- Indian Certificate of Secondary Education, Grade 10

August 2023-Present  
June 2016-June 2023

## STANDARDIZED TESTING AND APs

- SAT 1560 (English: 760, Math: 800)
- AP: Psychology (5)
- TOEFL :110/120

2023  
2024

## ACADEMIC HONORS AND AWARDS

### School Awards

- Consistent achievement of 40/42 in IB 11th standard with 7s in all the HL subjects (Chemistry, Biology and Mathematics AA)
- Honors Certificate for 80/84 Aggregate in both terms in Grade 11
- Psychology SL Prize for receiving highest total marks in Grade 11
- Highest marks in Biology in Grade 12 Term 1 and Grade 11 Term 2; Highest marks in Psychology in Grade 12 Term 1
- Perfect score (100/100) in Chemistry, Biology, History, Geography and Technical Drawing in ICSE (10th) Board
- Honors Certificate for 80%+ score in Grade 10

2023-2024  
2024  
2024  
2024  
2023  
2023

### National/International Awards

- Selected as one of the finalists in India for Biochemistry category at IRIS National Fair
- Shortlisted in Shing-Tung Yau High School Science Award first round of assessment
- Credit award in International Chemistry Quiz (ICQ)
- Merit award for essay on youth mental health epidemic for John Locke Global Essay Competition
- Received High Commendation for essay on Bioluminescence for Minds Underground Essay Competition
- Won Silver prize for essay on S. Bahuguna for Queen's Commonwealth Essay Competition
- Maths – SIMSO (Silver Award), IMOCSEA (Bronze Award) ; Science – SIMSO (Achiever Award)

2023  
2024  
2024  
2024  
2024  
2022  
2024

## CHEMISTRY AND BIOCHEMISTRY RESEARCH AND EXPERIENCES

### Research

#### Author, Structural & Biophysical studies of $\beta$ -galactosidase from *Oryza sativa*

2023 - 2024

- Researched and wrote original paper on Structural & Biophysical studies of  $\beta$ -galactosidase from *Oryza sativa* under guidance of mentor & PhD candidate at *Gautam Buddha University, Dr. Aditi Srivastava*
- Anion-exchange chromatography was performed to purify the enzyme. Circular Dichroism revealed percentages of  $\alpha$ -helix (15.9%) and  $\beta$ -strands (30.4%) in the enzyme
- In-silico methods were implemented to attain the three-dimensional structure of  $\beta$ -galactosidase from *Oryza sativa*
- Performed molecular docking for catalytic sites
- My work supports the structure-based drug design for developing an analogue in place of non-functional lactase enzymes
- Conducted extensive literature review and analyzed findings in a research paper; shortlisted for Initiative for Research & Innovation in STEM (IRIS) and Shing-Tung Yau High School Science Award

#### Author, Research on impact of salinity on hydroponic systems

2024

- Presently working on researching the effects of salinity on hydroponic systems under the guidance of *Dr. Ravi Mariwala (CEO of Scientific Precision Pvt. Ltd ; Member of Stanford's Tech & Innovation Advisory Group)*
- Developed seven home-based hydroponic systems using water trays, Gujarat sand, and various sizes of rocks. Leveraged Pascal's Law from fluid mechanics to monitor the water level in the whole system using recycled water bottle
- Made inferences regarding optimum salinity for growth using data like changes in pH levels, Total Dissolved Solids (TDS), Electrical conductivity and radicle length of mung beans.

### Internships

#### Asian Paints (Large corporate)

2024

- Asian Paints is India's largest paints company (USD 4.2 bn revenue for 2023) specializing in decorating and industrial coatings ; visited factories to understand wastewater recycling and chemical effluent treatment systems
- Analyzed efficacy of the process and equipment of wastewater recycling

#### ImmunoAct (Startup)

2024

- Interned at breakthrough immunotherapy tech company under *Dr. Rahul Purwar* that has successfully rolled out CAR-T Cell Therapy for blood cancer at 10 percent cost compared to global cost benchmarks
- Studied flow cytometry to understand its utilization for CAR-T Cell Therapy and helped with sensitive ELISA procedure using spectrophotometer. Analyzed data and created plots

#### Indian Institute of Technology (IIT) Bombay (College Laboratory)

2023

- Interned under *Dr. Rohit Srivastava, head of NanoBios Lab at IIT Bombay*; shadowed team member *Dr. Vaishali Pawar's* work on skin issues such as psoriasis.
- Learnt usage of tools & concepts such as spectrophotometers and viscometers; studied antioxidant properties of liposomes etc. via DPPH assay to create a novel hydrogel for psoriasis treatment
- Took daily observations and tracked progress through visits to Rheology lab, measuring viscosity of gel

### Independent experimentation

2024-Present

- My ongoing **Extended Essay** in Chemistry is on "Effect of cation charge density and pH on rate of aggregation of silver nanoparticles using UV-vis spectrophotometer at 420 nm wavelength".
- Have already synthesized the silver nanoparticle solution and created the respective pH and salt solutions

- Full Steam Ahead (FSA)/School science club 2023
- Finalist at **Inquest competition** ; created biodegradable plastic with a team of three using potato starch and sodium alginate
- Outreach
- Beco Natural Products** 2024
- Raised awareness in local community about substituting chemical-based home cleaning products with natural products
  - Conducted sessions for over 100 families in our community
- Online credit bearing courses
- Principles & Techniques of Molecular Biology by Harvard SSP**, Final grade of A : Four credits : 7 weeks 2024
- Calculus II (For Biology and Social Science) by John Hopkins University**, Final grade of A : Four credits : 7 weeks 2024
- Pre College: Applications of Chemistry in Medicine by JHU**, Final grade of A- ; One credit : 2 weeks 2024
- Collaboration
- Participant, Junior Academy, New York Academy of Sciences 2023
- Selected to participate in interactive STEM based competition to solve challenges based on global issues
  - With team of 3, developed a project on SMS messaging for sustainable agriculture under Green Homes, Green Schools, Green Communities

## COMMUNITY LEADERSHIP

- Founder, Best Tellers ([www.besttellers.org](http://www.besttellers.org)) 2022 – Present
- Founded project helping children explore storytelling and creative writing as a medium of expression that helps them process emotions, develop empathy and build resilience.
  - Authored Best Tellers Curriculum on fundamentals of storytelling.
  - Delivered curriculum through six interactive sessions at Sparsha NGO in Mumbai. Organized fundraiser to assist Sparsha NGO
  - Established Best Tellers Volunteer Club by reaching out to multiple NGOs like Sparsha, Hamari Pahchan, Sukhad, and Catalysts for Social Action.
  - Trained teachers and volunteers to implement the Best Tellers learnings module. Donated curriculum and session plans.
  - Conducted Finding Best Teller competition in July 2023 with 40 participants. Compiled Dream Teller Anthology featuring 16 stories written by students from the above NGOs. Distributed printed copies of the anthology funded by an online fundraiser
  - Reached over **5000 students** through collaboration with these NGOs
  - Inculcated two juniors from school to be part of the Best Tellers team and to carry the initiative forward

## MUSIC ACHIEVEMENTS

- Musician, Piano 2012 – Present
- I started playing Piano at the age of 5 and have been honing both my playing as well as performance skills since then.
- Trained with Ms. Shivani at 99, the Piano Academy. Worked on sight-reading, minor keys, and aural skills
  - Performed a rendition of *For Your Eyes Only* by Sheena Easton to a crowd of over 500 people at the Royal Opera House
  - Selected to be part of The Music Appreciation Club - which taught and exposed the students to a variety of musical initiatives
  - Cleared Grade 7 of the Examinations with score of 90 with distinction
- Musician, Vocals 2012 – Present
- In singing, I enjoy Rock & Pop, but my repertoire extends to Western and Indian classical music as well.
- Trained in singing with Mr. Stephen Fernandes at the SOBO House of Music
  - Performed ‘When I Grow Up’ from Matilda at Royal Opera House
  - Performed at “Notes to Remember Show” organized by Stephen Fernandez
  - Performed at Cathedral and John Connon charity event “Encore” for the benefit of affiliated NGOs
  - In addition, I have done studio recordings of some beautiful old Hindi song melodies like “Tujhse Naraz Nahin Zindagi” (composed by famous composer R.D.Burman), and “Ajeeb Dastaan Hai Yeh” (song by famous Lata Mangeshkar).
  - Successfully completed Grade 8 of the Trinity Exam (Rock&Pop)

## SCIENCE OUTREACH and CLUBS

- Writer, Scientific Teen Magazine 2024
- Contributed to science magazine featuring work by young adults and teens; contributed one piece on “Bioluminescence” and another titled “From Comics to Reality: The Ethical and Scientific Frontiers of Human Genetic Enhancement”, planning two more before the end of the term
- Speaker Series, Full Steam Ahead (FSA) Science Club 2024
- Initiated FSA Speaker Series with speakers from science backgrounds; conducted 2 sessions so far and 3 more in planning
  - The sessions included getting scientists from companies like Log9 (award winning battery technology startup) and ImmunoAct (innovative Car-T Cell therapy startup) to present and interact with the students
- Editor, Decrypted School magazine 2024
- Served as editor of club magazine, Decrypted, for two editions
- Participant, Singapore International Science Camp, National University, Singapore 2022
- Studied sub-atomic and molecular structures, DNA analysis
- Member, Cathedral Math & Physics Team, 2023-Present
- Participated in Cathedral Physics Bowl with tests on Physics concepts (March 2024)

## EXTRACURRICULAR ACTIVITIES

- Young Entrepreneurs Academy Won Bronze Award; invited to Rochester to represent India team in-person (Covid19 disrupted) 2020

## SKILLS and INTERESTS

**Languages:** English (fluent), Hindi (fluent), Korean (intermediate) | **Interests :** Singing, Reading, Snorkelling