

National Institute of Science Education & Research Bhubaneswar

Annual Report

and

Audited Statement of Accounts



भारत 2023 INDIA



2022-2023



About the Events: To celebrate the 75th year of Independence, a monthly NISER Outreach Talk Series was initiated at NISER for school students from Class IX to XII and First-year College students. The talks are based on relatable concepts and are structured to be interactive, emphasizing question-answer sessions. These talks are usually given by NISER faculty members from various schools and are online and offline or both.

There were four talks conducted in the year 2023-24 in which approximately 600 students had participated.

Browning Reactions

Enzyme-catalyzed browning - browning of apples/vegetables

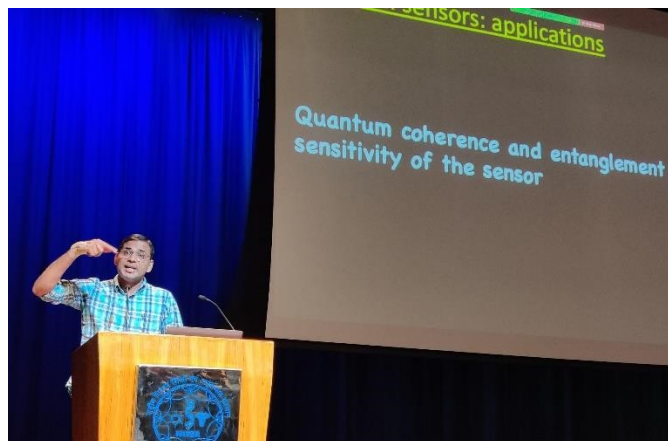
The diagram illustrates the chemical pathway of enzyme-catalyzed browning. It starts with Phenol (a benzene ring with one hydroxyl group). Polyphenol oxidase, using O₂, converts Phenol to Diphenol (a benzene ring with two hydroxyl groups). Further action of Polyphenol oxidase with O₂ converts Diphenol to Quinone (a six-membered ring with two carbonyl groups). Quinone then leads to the formation of Brown pigments (Melanin). A photograph of a sliced apple is shown to the left of the reaction scheme.

In the year 2022-23, the Outreach cell has conducted a total of 20 such educational visits. These visits were from various schools and colleges in Odisha, where approximately 1200 students and 250 teachers participated. These educational institutes include GHVM School, Jupiter College, JNV Khurda School, School of Forensic Science, Centurion University, Jatni, Rajdhani College, Carmel School, KV Khurda Road, Sailabala Women's Autonomous College, Carmel School, GIET University, DPS Paradip Refinery, JNV Mundali, Cuttack, Mahamayee Mahila Mahavidyalaya, BJB High School, Odisha Adarsh Vidyalaya Sangathan, Saraswati Sishu Vidya Mandir, Cuttack, Odisha Adarsh Vidyalaya Sangathan, DPS Dhenkanal, Freedom International School, Cuttack, Rajdhani College, Pranath College (Autonomous), Khordha, NIIS Group of Institutions, BBSR, KV No. 3, BBSR.

Outreach Talk Series 2022-23

Total Outreach Talks for the year 2022-23: 4

"Culinary Reactions" by Dr. U. Lourderaj, SCS



"Quantum Sensors" by Dr. Ashok Mohapatra, SPS

The 'spike' (S protein)

The diagram shows the structure of the S protein spike. It includes the Receptor Binding Domain (RBD), S1, and S2 subunits. The S1-S2 cut site is also indicated. The spike is embedded in the viral membrane. Specific regions like S1-CTD, S1-NTD, and S1/S2 are labeled. The diagram also shows interactions with ACE2 and DPP4. A reference is provided: Nature volume 588, pages 498-502 (2020).