

PT. MOHAN LAL S.D. COLLEGE FOR WOMEN

SH. UPKAR KRISHAN SHARMA BLOCK

"आदर्श अनुशासन मर्यादा ईमानदारी तथा उच्च मानवीय
मूल्यों के बिना किसी का जीवन महान नहीं बन सकता।"

PT. MOHAN LAL S.D. COLLEGE FOR WOMEN, GSDP
AFFILIATED TO GURU NANAK DEV UNIVERSITY, AMRITSAR

ACADEMIC PROGRAMS

B.Voc	10+1
B.Voc	10+2

PG FACILITY FOR WORKING WOMEN

Pt. MOHAN LAL S.D. COLLEGE FOR WOMEN, GURDASPUR

A MULTI FACULTY POST GRADUATE INSTITUTE

Re - accredited with 'A' grade by NAAC

MANAGED BY: GGSDS COLLEGE SOCIETY, CHANDIGARH

Affiliated to: GURU NANAK DEV UNIVERSITY, AMRITSAR

OUR INSPIRING SPIRIT



PT. MOHAN LAL JI

**FORMER EDUCATION, HOME AND FINANCE MINISTER, PUNJAB
FOUNDER PRESIDENT OF GGSD COLLEGE SEC-32, CHANDIGARH
PT. MOHAN LAL S.D. COLLEGE FOR WOMEN, GURDASPUR
PT. MOHAN LAL S.D. SCHOOL, CHANDIGARH.**



SH. UPKAR KRISHAN SHARMA JI

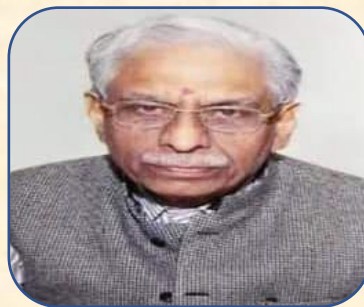
**FORMER PRESIDENT GGSD COLLEGE SOCIETY, CHANDIGARH
FORMER PRESIDENT PTMLSD COLLEGE FOR WOMEN, GURDASPUR
EX-VICE PRESIDENT, EVEREADY INDUSTRIES INDIA LTD.**

E-MAGAZINE

‘DARPAN’



Ms. Vaishali Sharma
President,
GGSDS Society Chd.



Dr. PK Bajaj
General Secretary,
GGSDS Society Chd.



Sh. Hiramani Aggarwal
Chairman,
PTMLSD College, Gurdaspur.



Dr. (Mrs.) Neeru Sharma
Chief Editor : Principal



Er. Surkhab Shelly
Editor

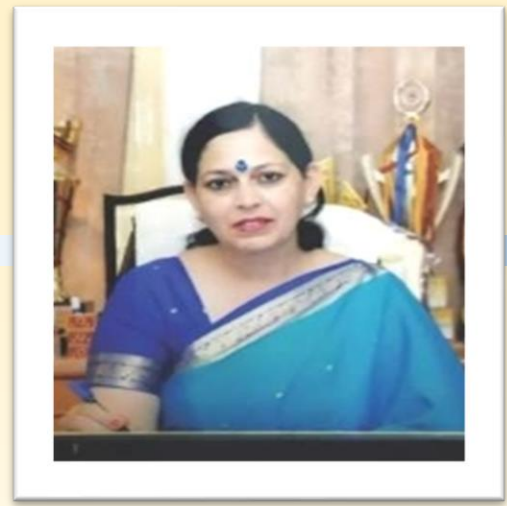


Dr. Khushboo
Editor



Mr. Ashwani
Technical Expert





Dear Sdians...

It gives me immense sense of fulfilment when I look at the monthly edition of college e-Magazine '**DARPAN**'. The essential purpose of e-magazine '**DARPAN**' is to inform, engage and inspire faculty, students, parents, alumni and our stakeholders. This e-magazine endeavors to reflect the values and the long tradition of excellence of the institution itself. Throughout the year campus buzzes with various activities that makes learning experience at SD Gurdaspur, a unique one. The perpetual efforts of the faculty, students and clubs/societies of the college in keeping the campus alive are commendable. Workshops, conferences, competitions, rallies, sports, guest lectures, FDPs, PDPs and a great variety of activities that corroborate academic learning help our students to grow in the real sense.

I congratulate editors for giving practical shape to my idea of e-magazine and wish all the best for inspired and result oriented session.

Dr. (Mrs.) Neeru Sharma
Principal



SKILL ENHANCEMENT PROGRAMS



In alignment with the National Education Policy (NEP), various skill enhancement programs were organised by the college. The Department of Commerce organized a Program on the Simulation of Commerce through Technology. This included understanding digital tools and platforms that are increasingly being used in modern commerce. Course instructor Ms. Manbir Kaur led the sessions, covering topics such as E-commerce Platforms, Financial Simulations, Digital Marketing Tools, and Virtual Business Environment. Students were engaged in a variety of activities such as Xero AI enabled accounting, get response AI enabled email marketing tools, various AI websites and digital marketing tools. The department of Fashion Designing organised a short-term course in 'Designing and Tailoring'. The incharges for this course were Ms. Komal and Ms. Amisha. Students learnt the painting methods and different embroidery patterns. In painting, students were guided how to make Mandala art and Lipin art along with the mode of colour contrast. The department of Cosmetology organised a short-term course in 'Beauty Therapy'. The incharge for this course was Ms. Sapna. Students learnt the different massage methods and techniques. Students were guided about skin care in the summer season and develop interpersonal skills and customer service techniques.



LOK SABHA ELECTIONS 2024



The Electoral Literacy Club organized an awareness program under the SVEEP activity. The purpose behind this event is to make students confident and exercise their democratic rights. As per instructions of the Election Commission, College Principal Dr. (Mrs.) Neeru Sharma along with the event in-charge, distributed Voter Guides 'Booklet' to students, educating them on how to vote in the upcoming Lok Sabha Elections. The students were instructed about the use of Electronic Voting Machines (EVMs) effectively and choose their candidate. The students were guided regarding the process of voting thoroughly. The campus was decorated for Elections 2024. 4 booths were also decorated and all facilities were provided to BLOs for smooth functioning of the elections. Students decorated walls by displaying posters, making rangoli and selfie stand. The supportive staff of the college helped the senior voters to reach the booths. First Time Voters (FTVs) were honoured by the college principal. She said every voter should use their right to vote as participation in the political process in order to strengthen Indian democracy. A concession of Rs. 2000 was also given to FTVs on producing certificate and ink mark. College Principal appreciated efforts made by members of ELC and teacher incharges.



THANKS GIVING CEREMONY FOR STAFF



A thanks giving ceremony was organised in which College Principal Dr. (Mrs.) Neeru Sharma expressed her gratitude towards each and every faculty member for their unwavering efforts throughout the session. She acknowledged the efforts of Vice Principal, IQAC Coordinator, IQAC team, IIC, Staff secretary, Registrar, Dean ECAs, incharges of CA, Advance Learners, Slow Learners, All departmental heads, Office administrative staff and library staff etc. for going above and beyond and supporting students' diverse needs. She appreciated the College Admission committee for arranging, PDPs, Summer workshops, inter School fests and sports meet. She applauded Team IQAC & IIC and its members for their role and taking quality initiatives in the campus. She acknowledged Dean ECAs, Heritage society, NSS, Language Society, Youth club incharges for arranging and preparing students for various cultural activities, Giddha & other events at GNDU youth festivals and other district and state level competitions. Each department of the college was appreciated for arranging workshops, seminars, Skill-development courses, exhibitions, field events, trips and tours. She made special mention of the Central Association and Rotaract for arranging charitable activities. She acknowledged that the Environment Association is hyper active throughout the session and appreciated the team for conducting green and energy audits. Members working for the routine activities & duties were also appreciated for press notes, time table, monthly reports, FDPs, scholarships, stock taking, staff- secretary, social media news, college photographs and hostel committee. She appreciated and motivated the staff for teamwork and deliberated that individually we may be a drop but together we are an ocean. Madam also discussed the upcoming future plans for admission and preparation for NAAC.



TOWARDS SUSTAINABLE DEVELOPMENT



On the occasion of 'World Environment Day' Eco club, NSS and IIC organized a 'Plantation Drive and Exhibition for Environmental Purification'. The chief guest, Mr. Romesh Mahajan, National Awardee and Honorary Secretary DCWC, attended the event. The program was organized with significant support from the National Edu Trust of India. The exhibition featured various items such as compost prepared in campus, cloth bags made by students, different types of plants, and earthenware (water coolers, glasses, cups, bird nests, and more). They appreciated the efforts made to protect and conserve the environment. At the end of the exhibition, the College Principal explained that the purpose of the exhibition was to encourage the use of earthenware instead of plastic, contributing to a pollution-free environment, and to promote the habit of using earthenware. Additionally, using cloth bags instead of plastic ones helps in keeping the environment clean. Various types of plants in the exhibition were also bought enthusiastically by the college staff and students. The chief guest acknowledged that SD College stands at the forefront in maintaining a green campus and is a pride of the region.



RECOGNISING THE EFFORTS OF CENTRAL ASSOCIATION



Thanks Giving ceremony (Idea envisioned by College Principal since 2018) was organized for Central Association to recognize their services throughout the year. Every year, our college organized this event to appreciate the work done by volunteers of the Central Association. This association is formed by selecting students from each class and each section as CAs and CRs. The chief guest of this ceremony was Mrs. Kusum Verma (Former Principal, K.N College for Women, Phagwara). Activities of CA were highlighted through PPT. In this PPT various charity projects of the Central Association like 'Share happiness with others', 'Prayas', 'Samvedna' etc. were highlighted and students were applauded for their contributions towards the organization and completion of these Projects. College Principal Dr.(Mrs.) Neeru Sharma also made a special mention of the work done by CA for the whole year. She said that CA works like a backbone with whose presence every task of the college can be accomplished successfully be it is about maintaining discipline or celebration of national days, other events or festivals. CA members honored the college Principal and expressed their gratitude towards her by so gave her blessings to all the CAs by saying that the empowerment of girls is much more required in these days. She said that the values inculcated in them by college will prove to be their life changer in upcoming phases of their lives. She congratulated the members of CA for their dedication and asked to continue this hard work to improve their personalities.



WORKSHOP ON CRAFTY CREATIONS



The Fine Arts department of the college organised a workshop on 'Crafty Creations'. The main aim of the workshop was to acquaint the students with the basic knowledge of craft work and different painting techniques. During the workshop, students learnt painting and different craft techniques. In craft work, students were guided to make fridge magnets, cards and art with waste.

LIVING A HEALTHY LIFESTYLE



The NSS unit and Sports club of the College celebrated 'International Yoga Day' on the theme 'Yoga for Women Empowerment'. The purpose of this event was to cultivate discernment, awareness, self-regulation and higher consciousness in the individual. Volunteers performed various yog asanas like Pranayama, Bhakti Asan, Namaskar Asan, Haas Asan, Chakra Asan, Padmasana, Karma Asan, Paschim Utan Asan etc. were performed by the students and their family members with their family members. College Principal motivated teachers and students to adopt yoga as a way of life.



AWARD CEREMONY OF ROTARACT CLUB



Rotaract International District 3070 organised an event 'Paarag se pallav ', a Thanksgiving and award ceremony of RTN./RTR. and DRR 2023-24 Nishul Sood and his team at Jalandhar. The college bagged 2 awards: Supporting Club of District and Outstanding Club (Silver). Also, a special recognition were given to 5 students Shruti, Taruna, Monika, Nandani and Komal of Rotaract Club. Award of honor was also presented to club incharges Dr. Khushboo Aggarwal and Mrs. Harsha Sharma for their dedication, hard work, and the positive impact on students. Club members and incharges are thankful to College Principal Dr. (Mrs.) Neeru Sharma for always supporting and motivating them for doing social work.

PLANT OF THE MONTH



The Eco Club declares a seasonal plant as a plant of the month, Since 2018 this regular practice is being followed by Eco Club. In the month of June 'Mango' was declared as a plant of the month. Mangoes are not only delicious but also packed with nutrients and health benefits. They are rich in nutrients, boosts immunity, supports digestive health, improves skin health, has antioxidant properties and enhances eye health. Enjoying mangoes as part of a balanced diet can contribute to overall well-being and provide a tasty way to get essential nutrients.



APPRECIATION FOR COLLEGE



The National Edu Trust of India, an organization under the Ministry of Micro, Small, and Medium Enterprises, Government of India, has awarded our college the prestigious Best Green Campus Initiative Award for 2024-25. This recognition highlights the college's extensive green initiatives, including vermicomposting, SD Nursery, awareness rallies, outreach programs, plantation drives, Project ARPIT and ASHIYANA, Van Mahotsav, and the Plant of the Month campaign, all of which contribute to creating a more sustainable campus.

In addition, the College Principal, Dr. (Mrs.) Neeru Sharma, was honoured with the Award of Honour for Best Principal, and Mrs. Samita Khajuria, Assistant Professor in Economics, received the Best Teacher Award. These awards acknowledge their outstanding dedication and innovation in promoting environmental sustainability through education, shaping a better future. Mr. Samarth Sharma, CEO of the National Edu Trust of India, praised Dr. Sharma for her exemplary leadership and Mrs. Khajuria for her steadfast commitment to fostering environmental awareness among students.



ARE HUMAN RESOURCES IMPORTANT FOR AN ORGANISATION?

Human beings are considered as an integral part of any organisation. They are considered as invaluable assets like other physical assets. Humans are central to the functioning and success of any organization. Their importance can be highlighted across various dimensions:

- 1. Strategic Decision-Making:** Humans bring critical thinking, creativity, and experience to strategic planning and decision-making. They analyze complex situations, predict outcomes, and devise strategies that align with organizational goals.
- 2. Innovation and Creativity:** Human employees drive innovation by generating new ideas, solving problems, and adapting to changing environments. Their creativity can lead to product development, process improvements, and competitive advantages.
- 3. Operational Efficiency:** Employees manage and execute daily operations, ensuring that processes run smoothly and effectively. Their skills and expertise are crucial for maintaining productivity and meeting organizational objectives.
- 4. Customer Interaction and Service:** Human interactions are vital in building relationships with customers. Employees provide customer service, understand client needs, and create personalized experiences that can enhance customer satisfaction and loyalty.
- 5. Organizational Culture:** Humans shape and sustain the organizational culture. Their values, behaviors, and interactions create an environment that can foster collaboration, motivation, and engagement.
- 6. Leadership and Management:** Effective leadership and management are provided by humans who guide teams, set goals, and drive performance. They motivate employees, resolve conflicts, and make key decisions that influence the direction of the organization.

7. Talent and Skill Development: Employees contribute their skills and expertise to the organization and continuously develop these capabilities. Training and professional growth opportunities are essential for maintaining a skilled and knowledgeable workforce.

8. Change Management: Humans are instrumental in managing and adapting to change. They navigate transitions, communicate effectively, and help implement new systems or processes, ensuring that change is embraced rather than resisted.

9. Ethical and Social Responsibility: Human employees uphold ethical standards and social responsibilities. They ensure compliance with regulations, promote ethical behavior, and contribute to corporate social responsibility initiatives.

10. Team Dynamics and Collaboration: Effective teamwork and collaboration are driven by human interaction. Employees work together, share knowledge, and leverage diverse perspectives to achieve common goals.

CONCLUSION

In essence, humans are the backbone of an organization, providing the talent, skills, and interpersonal elements necessary for success and growth. Their contributions are fundamental to achieving organizational objectives and adapting to an ever-evolving business landscape.

REFERENCES

Amabile, T. M. (1996). Creativity in Context. Westview Press.

Kotter, J. P. (1996). Leading Change. Harvard Business Review Press.

Noe, R. A. (2017). Employee Training and Development. McGraw-Hill Education.

Northouse, P. G. (2018). Leadership: Theory and Practice. Sage Publications.

DR. KHUSHBOO AGGARWAL
ASSISTANT PROFESSOR
DEPARTMENT OF COMMERCE

CONNECTING CHEMICAL WORLDS FOR A SUSTAINABLE FUTURE

Understanding the Core Idea

The phrase "Connecting chemical worlds for a sustainable future" emphasizes the crucial role of chemistry in addressing global challenges and building a greener tomorrow. It suggests a need for interdisciplinary collaboration, innovation, and a holistic approach to harness the power of chemistry for positive change.

Key Areas:

To achieve a sustainable future, the chemical world needs to focus on several key areas:

1. Green Chemistry and Sustainable Processes

Designing greener products: Creating chemicals and materials with minimal environmental impact throughout their lifecycle.

Developing sustainable processes: Implementing eco-friendly methods for chemical production, reducing waste and energy consumption.

Resource efficiency: Optimizing the use of raw materials and energy in chemical industries.

2. Renewable Energy and Materials

Energy storage: Developing advanced materials for efficient and long-lasting batteries.

Renewable fuels: Creating clean and sustainable alternatives to fossil fuels.

Circular economy: Designing products with end-of-life in mind, promoting recycling and reuse.

3. Environmental Remediation and Pollution Control

Clean water technologies: Developing innovative solutions for water purification and treatment.

Soil remediation: Addressing soil contamination and restoring ecosystem health.

Air pollution control: Reducing harmful emissions and improving air quality.

4. Healthcare and Medicine

Drug discovery: Utilizing chemistry to develop new and effective treatments for diseases.

Biomaterials: Creating biocompatible materials for implants and tissue engineering.

Personalized medicine: Tailoring treatments based on individual genetic makeup.

5. Food and Agriculture

Sustainable agriculture: Developing crop protection and fertilization methods with minimal environmental impact.

Food safety: Ensuring food products are safe and nutritious.

Food waste reduction: Finding innovative ways to preserve food and reduce waste.

6. Interdisciplinary Collaboration

Partnerships: Fostering collaboration between chemists, biologists, engineers, and social scientists.

Knowledge sharing: Promoting open science and knowledge exchange.

Policy influence: Engaging with policymakers to create supportive environments for sustainable chemistry.

CHALLENGES

While the potential for chemistry to drive a sustainable future is immense, there are significant challenges to overcome:

Economic factors: Balancing environmental sustainability with economic viability.

Technological limitations: Developing the necessary technologies and infrastructure.

Public perception: Addressing concerns about the chemical industry and building trust.

OPPORTUNITIES

Regulatory Hurdles: Complex and often conflicting environmental regulations can hinder innovation and increase costs. Harmonized and supportive policies are crucial.

Public Perception: Negative perceptions of the chemical industry can create barriers to public acceptance of new technologies, even if they are environmentally beneficial.

Talent Gap: A shortage of skilled professionals with expertise in green chemistry and sustainable technologies can hamper progress.

Supply Chain Issues: Ensuring the sustainability of the entire supply chain, from raw material extraction to product disposal, is complex and requires collaboration across industries.

Conclusion:

Chemistry plays a central role in science and is the basis of one of the major, more impactful, and diverse industries. However, to address the most pressing global challenges, we must learn to create connections in an effective and meaningful way, with other disciplines, industries, and society at large. Every molecule, material, and process should be designed with recovery, reuse, and recyclability in mind – the basis of circular chemistry. It won't be easy, but we are not alone,

other scientists across disciplines will help too. We just need to make the connections. Luckily, bonding is something chemists are very good at. By working together, we can harness the power of chemistry to build a better world for generations to come.

References:

M. Franci Nat. Chem., 2023, 10.1038//s41557-023-01336-5 15 , 1319 CrossRef CAS

J. M. Lehn Angew. Chem., Int. Ed., 2015, 10.1002/anie.201409399 54 , 3276
CrossRef CAS PubMed .

R. Packroff and R. Marx , ChemPlusChem, 2022, 10.1002/cplu.202100534 87 ,
e202100534 CrossRef CAS PubMed

J. Rockström et al., Nature, 2009, 10.1038/461472a 461 , 472 —475 CrossRef
PubMed .

V. Tulus , J. Pérez-Ramírez and G. Guillén-Gosálbez , Green Chem., 2021,
10.1039/D1GC02623B 23 , 9881 RSC .

<https://iupac.org/project/2020-014-3-050/>.

C. A. Urbina-Blanco et al., Chem. Sci., 2020, 10.1039/D0SC90150D 11 , 9043 RSC .

Nature, 2023, 618, 647, 10.1038/d41586-023-01989-9.

MRS. KAMALJIT
ASSISTANT PROFESSOR
DEPT OF CHEMISTRY

STUDENT ENTREPRENEURSHIP

Student entrepreneurship is when a student at a university or higher education institution starts a business to meet their needs while still in school. Student entrepreneurship empowers young minds to transform their ideas into tangible ventures. It encourages them to take ownership of their creativity and drive. Engaging in entrepreneurial activities hones essential skills such as critical thinking, problem-solving, communication, and adaptability. Student-led startups contribute to local and national economies by creating jobs, fostering innovation, and addressing societal needs. Entrepreneurship exposes students to a diverse network of mentors, investors, and fellow entrepreneurs, enhancing their professional connections.

Some tips to help students who wish to be entrepreneurs:

- **Use university resources:** - Make the most of your university's resources, such as incubation centers or venture studios, to develop your idea and access resources and mentoring.
- **Make connections:** - Build relationships with peers, alumni, professors and industry professionals that enable your journey. Whether it is for an apprenticeship or a dissertation, the right connections offer new opportunities, enable you to grow, and build teams of your own.
- **Create a business plan:** - Outline your goals and plan how you will achieve them. Basing your academic dissertation on your actual business goals and plan is a great way to get ahead of your future plans.

•Creativity is key: -You do not have to do anything 'new' or out of the box but it is important to do things differently. Whether it is about making enhancements to existing products and services or applying an alternative business model and application of solutions to a problem.

•Plan to raise capital: - Plan your pitch to investors in advance, as capital can be raised from many sources. The amount and funder will depend on your circumstances.

Successful Teenage Entrepreneurs in India:-

1.Ritesh Agarwal: - Passionate about travelling, 17-year-old Ritesh realised the need for affordable hotels that offered good services. His unique drive for identifying, understanding and solving the problem helped him create a huge empire that was built on the concept of fulfilling the requirements of the travellers – affordable rooms with standard facilities. His venture, OYO (On Your Own) is valued at more than \$10 billion and Ritesh's net worth is more than \$1 billion, which makes him the world's second-youngest self-made billionaire.

2.Advait Thakur: - Advait is a young tech entrepreneur who is changing the world. He founded his own tech company Apex Infosys when he was 12 years old. The company is now a global technology and innovation company that specialises in IoT- related services and products, AI and Health Tech sectors. Advait is also the youngest Google, Bing and Hubspot Certified Professional.

3.Vinusha MK: - A simple cake baking task to surprise her mother on her birthday led Vinusha to start an enterprise of her own – Four Seasons Pastry. She was 9 years old at that time. Vinusha bakes and sells cupcakes inspired by the four seasons. She

is scaling up her business and has already launched a baking kit that comes complete with ingredients and recipes, homemade chocolates, sandwiches and more. Needless to say, every order here is baked with passion.

4. Tilak Mehta:- Inspiration for a startup can come from anywhere. Nothing illustrates this better than Tilak Mehta and his success story Paper N Parcels. The story goes something like this – 13-year-old Tilak needed some books urgently from the other part of Mumbai city. But despite waiting all day for his father to return from work so he could go and get them, young Tilak was left disappointed – his father was just too tired. Instead of sulking or throwing a tantrum, Tilak struck gold from the situation. He conceptualized a startup that could deliver small parcels within the city on the same day. His venture, Paper N Parcels immediately found traction and took off. It now employs over 200 workers and 300 dabbawallas and handles over 1200 deliveries in a day. Tilak is among the youngest Forbes panelists, a TEDx speaker and a Youngest Entrepreneur awardee In Logistics Sector.

5. Sreelakshmi Suresh: - Sreelakshmi began using computers at the age of 3, started designing at 4, designed her first website at the age of 6 and owned a startup at 11! Life has certainly been on the fast lane for her! She has often been regarded as one of the Youngest CEOs and Youngest Web Designers. Apart from her startup eDesign, Sreelakshmi also owns another company Tiny Logo.

Conclusion

Student entrepreneurship is not just about starting a business; it's about cultivating an entrepreneurial mindset that fosters creativity, resilience, and adaptability. As students, engaging in entrepreneurship allows you to apply classroom knowledge

to real-world challenges, develop leadership skills, and gain invaluable experience that sets you apart in a competitive job market. By embracing entrepreneurial endeavors, you not only contribute to economic growth but also become change-makers who drive innovation within your communities.

References

[https://www.storagescholars.com/blog/14-entrepreneurs-who-started-their-business-in-](https://www.storagescholars.com/blog/14-entrepreneurs-who-started-their-business-in-college#:~:text=Mark%20Zuckerberg&text=While%20he%20may%20be%20mega,from%20his%20Harvard%20dorm%20room)

[college#:~:text=Mark%20Zuckerberg&text=While%20he%20may%20be%20mega,from%20his%20Harvard%20dorm%20room](https://www.storagescholars.com/blog/14-entrepreneurs-who-started-their-business-in-college#:~:text=Mark%20Zuckerberg&text=While%20he%20may%20be%20mega,from%20his%20Harvard%20dorm%20room)

<https://www.thehindu.com/education/tips-for-student-entrepreneurs/article66312871.ece>

<https://fastercapital.com/topics/introduction-to-student-entrepreneurship.html>

<https://bigrededucation.com/11-successful-teenage-entrepreneurs-in-india/>

BAVNEET KAUR

BCOM 3RD YEAR

ROLL NO-3413

NITROPLAST: NEW WAY TO FIX NITROGEN

Nitroplast is an organelle found in certain species of algae, particularly in the marine algae *Braarudosphaera bigelowii*. It plays a crucial role in nitrogen fixation, a process previously thought to be exclusive to bacteria and archaea. The discovery of nitroplasts has significant implications for both cellular biology and agricultural science. In 1998, Jonathan Zehr, an ocean ecologist at the University of California, Santa Cruz, found an unknown DNA sequence that appeared to be for an unknown nitrogen-fixing cyanobacterium in the Pacific Ocean, which they called UCYN-A (unicellular cyanobacterial group). At the same time, Kyoko Hagino, a paleontologist at Kochi University, was working to culture the host organism, *B. bigelowii*.

The existence of nitroplasts was first proposed by researchers studying the interaction between *B. bigelowii* and UCYN-A in 2012. Initially, it was hypothesized that UCYN-A facilitated nitrogen fixation, providing compounds like ammonia to the algae. Nitroplasts exhibit typical organelle characteristics, meeting two key criteria: they are inherited during cell division and rely on proteins provided by the host cell. Through imaging studies, researchers observed that nitroplasts divide along with the host cell, ensuring their passage to daughter cells. In two recent papers, an international team of scientists describe the first known nitrogen-fixing organelle within a eukaryotic cell. The organelle is the 4th example in history of primary endosymbiosis. This is the process by which a prokaryotic cell is engulfed by a eukaryotic cell and evolves beyond symbiosis into an organelle.

RIYA JAMBA
BSC MEDICAL
(5TH SEM)

THE PLANT CELL: A MARVEL OF EFFICIENCY AND ADAPTABILITY

The plant cell is a remarkable entity that packs an astonishing array of functions into a tiny package. Despite its small size, the plant cell is a self-contained powerhouse that supports the growth and development

of plants. It is a testament to the incredible efficiency and adaptability of nature's design.

Structure and Function

The plant cell consists of several organelles, each with a unique function. The cell wall provides support and protection, while chloroplasts harness light energy through photosynthesis. Mitochondria generate energy through cellular respiration, and the endoplasmic reticulum synthesizes and transports nutrients and proteins. Vacuoles store and recycle waste, and plastids produce and store pigments.

Efficient Energy Production

Plant cells are incredibly efficient at producing energy. Chloroplasts harness light energy through photosynthesis, converting it into chemical energy that fuels the plant's growth and development. This process occurs in specialized regions called thylakoids, where light-absorbing pigments like chlorophyll play a crucial role. In addition, plant cells have developed innovative solutions to optimize energy production, such as the use of antenna pigments to capture light energy.

Adaptable and Resilient

Plant cells are adaptable and resilient, able to respond to environmental stimuli and adjust to changing conditions. They can survive in a wide range of environments, from scorching deserts to lush rainforests, and even adapt to extreme temperatures and drought. Plant cells achieve this through various mechanisms, including the production of stress hormones and the activation of defence genes.

Innovative Solutions

Plant cells have evolved innovative solutions to optimize their functions, such as:

- Vacuoles for storage and recycling
- Endoplasmic reticulum for protein synthesis and transport
- Plastids for pigment synthesis and storage
- Cytoskeleton for structural support and cell signalling
- Peroxisomes for detoxification and stress response

Cellular Communication

Plant cells communicate with each other through complex signalling pathways, allowing them to coordinate activities and respond to environmental cues. This communication network enables plants to adapt to changing conditions and optimize their growth and development.

Advanced Mechanisms

Plant cells have also developed advanced mechanisms to regulate their growth and development, such as:

- Hormone signalling pathways
- Gene regulation networks
- Epigenetic modifications

Conclusion

The plant cell is a remarkable example of efficiency and adaptability, with a range of specialized organelles and functions that enable plants

to thrive in diverse environments. Its innovative solutions, ability to respond to environmental stimuli, and complex communication networks make it a fascinating subject of study.

References:

Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2002). *Molecular Biology of the Cell*. 5th edition. New York: Garland Science.

Hall, D. O., & Rao, K. K. (1999). *Photosynthesis*. 6th edition. Cambridge University Press.

Trewavas, A. (2003). Plant cell signal transduction. *Journal of Experimental Botany*, 54(393), 1-5.

NAVDEEP KAUR

B.SC. MED. SEM. V

ROLL NO: 3729

PT. MOHAN LAL S.D. COLLEGE FOR WOMEN, GURDASPUR.

PT. MOHANLAL'S-D.COLLEGE
FOR WOMEN

"आदर्श अनुशासन, मर्यादा, ईमानदारी तथा उच्च मानवीय

मूल्यों का बिना कटौत की जायें महान नहीं बन सकते।

Email Id: ptmsd@gmail.com

Website: www.ptmsdc.ac.in

Facebook page: <https://www.facebook.com/ptmsdc.ac.in>

Instagram: [s.d.college_gsp](https://www.instagram.com/s.d.college_gsp)

YouTube: <https://www.youtube.com/channel/UCKenaiCllkYYbtGWzY54uiw>

Contact us: 01874-502681

SAFE HOSTEL AND P.G FACILITY AVAILABLE FOR WORKING WOMEN

