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A pharmaceutical magazine

SHADOW CULTIVATE

AUTUMN ISSUE
2024-25



CHIEF EDITOR

Dr. Rajiv Jash

STUDENT EDITORS

Amisha Agarwal and Pratyushi De



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PREFACE

We are delighted to present the inaugural volume of Shadow Cultivate, a vibrant and multifaceted academic magazine published under the aegis of Sanaka Educational Trust's Group of Institutions, and curated under the insightful leadership of Chief Editor Dr. Rajiv Jash. This publication is more than a compilation of articles and artworks—it is a collective journey of thought, creativity, inquiry, and expression that brings together scientific intellect, literary soul, and civic consciousness into a single cohesive platform. The vision behind Shadow Cultivate stems from the desire to break disciplinary silos and to encourage students, scholars, artists, and educators from all streams to participate in an open dialogue that both reflects and shapes the academic spirit of our time. This magazine is not just a reflection of our institutional excellence but a mirror of our students' voices—of their curiosity, concerns, creativity, and courage. This issue is thoughtfully divided into three major sections: Scientific Advancements, Art & Literature, and Current Affairs. Each segment opens a window into a different realm of human understanding while remaining rooted in the larger ethos of education, inquiry, and cultural expression. The Scientific Advancements section covers emerging and impactful areas such as modern drug delivery techniques, drug discovery and many more. These articles, meticulously researched and articulated, reflect the scientific temperament of the young contributors and provide valuable insights into fields that are shaping our future. In Art & Literature, we have curated a soulful selection of poems, paintings, short stories, and reflective pieces—both in English and regional languages—that reflect the emotional, cultural, and spiritual landscape of today's youth. Whether it is the empowering image of the divine feminine in visual art, the moving poetry that explores love, identity, or nature, or prose pieces that narrate stories of pain, escape, hope, and resilience, these entries reveal the depths of student thought and artistic potential. This section brings sharp focus to the political, social, and cultural conversations that matter that empower young minds to look beyond the classroom and engage meaningfully with the world around them. This magazine is the result of months of hard work, collaboration, and unwavering enthusiasm. We express our heartfelt gratitude to all the student authors, artists, editorial team members, and faculty mentors who have contributed their time, talent, and passion to bring this issue to life. Each submission was carefully reviewed and thoughtfully presented, ensuring a high standard of academic and creative quality throughout. We would also like to thank the Sanaka Educational Trust's Group of Institutions for their constant encouragement and support. Under the dynamic guidance of Dr. Rajiv Jash, this magazine has found its rhythm and voice—elevating the collective spirit of our institution and enriching its intellectual culture. As you turn these pages, we invite you to engage—not just as a reader but as a fellow cultivator of ideas. We hope that Shadow Cultivate Vol. 5 inspires critical thought, stirs your imagination, and awakens a deeper connection to the world we live in. May this be the beginning of an ongoing dialogue between disciplines, languages, generations, and minds.

Let this be not just a magazine, but a movement of minds—a shared space where science meets poetry, art meets activism, and thought meets transformation.

The Editorial Team

Shadow Cultivate Vol. 5

Sanaka Educational Trust's Group of Institutions



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DIRECTOR'S NOTE

It is with great pride and pleasure that I extend my warmest regards through this special note as we unveil Shadow Cultivate, an intellectual and creative endeavour initiated under the banner of Sanaka Educational Trust's Group of Institutions. More than just a magazine, Shadow Cultivate stands as a dynamic forum that captures the academic, artistic, and innovative expressions of our students and faculty. It bridges disciplines, ideas, and imaginations—where science meets art, and thought meets action. This edition reflects the diversity and depth of our institution, with contributions spanning scientific advancements, literary works, socio-political commentaries, and current affairs. At the heart of this vibrant collective is the Department of Pharmacy, a pillar of academic excellence within our institution. The articles and research insights from this department illustrate not just the intellectual potential of our students, but also their readiness to address the challenges of modern healthcare with integrity, innovation, and empathy. Pharmacy as a profession is rapidly evolving in the 21st century. It is no longer limited to dispensing medicine; it has expanded into areas such as drug discovery, nanotechnology, pharmacovigilance, regenerative medicine, and personalized therapeutics. Our Department of Pharmacy recognizes this shift and is committed to preparing students for this broader, interdisciplinary future. The work showcased in this magazine—on topics like green chemistry, nanotechnology in neurology, sustainable drug design, and smart drug delivery systems—demonstrates a forward-thinking mindset. It is especially heartening to see students not only engaging in rigorous scientific inquiry but also reflecting on the ethical and environmental dimensions of their work. This balance of scientific rigor and social responsibility is what we aim to instill through our academic programs. Shadow Cultivate also serves as a mirror to the cultural and emotional richness of our campus. Poems, paintings, and prose featured in this volume remind us that science and art are not opposites but allies in the pursuit of truth and beauty. The inclusion of multilingual literary expressions and artwork ensures that every student voice—regardless of discipline or background—is heard and celebrated. As Director, I believe that this spirit of openness, diversity, and interdisciplinary dialogue is essential to nurturing the next generation of responsible global citizens. I congratulate all contributors, editors, and coordinators who have worked tirelessly to bring this vision to life. Your dedication is visible in every page and every word. May this magazine continue to grow as a testament to the values we cherish—excellence in education, innovation in research, and compassion in service. I urge all readers—students, faculty, and visitors—to engage deeply with this volume, and to carry forward the ideas and inspirations it offers. Let us cultivate not only knowledge, but also the wisdom to use it for the betterment of humanity



FROM THE PRINCIPAL'S DESK



It is with great pride and a profound sense of purpose that I, on behalf of the Department of Pharmacy, Sanaka Educational Trust's Group of Institutions, share this message to honor Shadow Cultivate—a magazine that truly embodies the harmony of academics, culture, and intellect within our institution. This publication has served as a vibrant platform for diverse voices and ideas, creating a meaningful bridge between science and the humanities—an ideal our department deeply upholds and nurtures.

The Department of Pharmacy has always been dedicated to shaping students into holistic professionals—individuals who possess not only technical expertise but also ethical values, social awareness, and cultural sensitivity. In this light, Shadow Cultivate stands as a perfect reflection of the multidisciplinary nature of modern pharmacy education. The insightful contributions of our students in this edition highlight their engagement with contemporary global challenges and their participation in an evolving academic environment. Their ability to merge scientific reasoning with creative expression—through poetry, prose, and art—is truly inspiring and reaffirms our belief that scientific excellence must coexist with emotional intelligence and creativity.

As the head of the department, it fills me with pride to witness our students evolving into future pharmacists, well-prepared to meet the complex and ever-changing demands of healthcare, technology, and patient-centric innovation. At Sanaka Educational Trust's Group of Institutions, we remain committed to fostering a learning ecosystem that extends beyond classrooms and laboratories. With state-of-the-art facilities, committed faculty, and a student-centered philosophy, we strive to ensure our learners are not only employable but also research-driven and socially responsible.

The enthusiasm and initiative shown by our students in contributing to Shadow Cultivate stand as strong evidence of this culture of academic freedom and encouragement. I extend heartfelt appreciation to the editorial board, faculty mentors, and every contributor whose efforts made this publication possible. Their collaboration truly represents the spirit of unity and shared purpose that defines our department and institution.

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1

**Scientific
Advancements****Urea Cycle
Disorders***Pratyushi De, Priyanka Gupta*

Urea Cycle Disorders (UCDs) are a group of rare genetic conditions that result from a deficiency of one of the six enzymes or two transporters involved in the urea cycle, a crucial metabolic pathway in the liver responsible for removing excess nitrogen from the body. Normally, nitrogen, a waste product formed when proteins are broken down, is converted into urea and excreted through the urine. However, in individuals with UCDs, this process is impaired, leading to the accumulation of toxic levels of ammonia (hyperammonemia) in the blood, which can be life-threatening. Symptoms of UCDs can vary widely depending on the severity of the enzyme deficiency and the age of onset. In newborns, symptoms often appear within a few days after birth and may include vomiting, lethargy, poor feeding, irritability, seizures, and coma, which can progress rapidly without prompt intervention. In milder or late-onset forms, symptoms might be triggered by high protein intake, illness, fasting, or physical stress, and may include behavioral changes, confusion, headache, vomiting,

and learning disabilities. The most common type of UCD is Ornithine Transcarbamylase (OTC) deficiency, which is inherited in an X-linked manner and primarily affects males, though females can be symptomatic carriers. Other types include deficiencies in carbamoyl phosphate synthetase I (CPS1), argininosuccinate synthetase (ASS1, causing citrullinemia), argininosuccinate lyase (ASL, causing argininosuccinic aciduria), and arginase (ARG1, causing argininemia). Diagnosis typically involves blood and urine tests to detect elevated ammonia and specific amino acids or metabolites, followed by genetic testing to identify the underlying mutation. Management of UCDs focuses on reducing ammonia levels and preventing future episodes. Acute treatment may include intravenous glucose and lipids to suppress protein breakdown, ammonia-scavenging drugs such as sodium benzoate or sodium phenylacetate, hemodialysis in severe cases, and a low-protein diet. Long-term management involves dietary protein restriction, supplementation with essential amino acids and compounds like arginine or citrulline, regular monitoring of ammonia levels, and the use of ammonia-scavenging medications. In some cases, liver transplantation may be considered, as it can potentially cure the disorder by providing a functioning urea cycle. Early diagnosis, particularly through newborn screening in high-risk populations, and prompt management are critical to preventing irreversible brain damage and improving outcomes. Genetic counseling is also important for affected families to understand the inheritance pattern and assess risks in future pregnancies. Research into gene therapy and novel

therapeutics is ongoing, offering hope for more effective and permanent treatments in the future. Despite their rarity, UCDs highlight the significance of metabolic pathways in maintaining health and the profound consequences when these pathways are disrupted.

2

*Scientific
Advancements*

Homocysteine and Cardiovascular Risk

Arati Dubey, Rajiv Jash

Homocysteine is a sulfur-containing amino acid produced as an intermediate in the metabolism of methionine, an essential amino acid derived from dietary proteins. Under normal physiological conditions, homocysteine is either remethylated back to methionine or converted to cysteine through the transsulfuration pathway, processes that require B-vitamins such as folate (vitamin B9), vitamin B6, and vitamin B12 as essential cofactors. However, when these metabolic pathways are impaired due to genetic mutations, vitamin deficiencies, or other underlying conditions, homocysteine can accumulate in the blood, a condition known as hyperhomocysteinemia. Elevated levels of homocysteine have been strongly associated with an increased risk of cardiovascular diseases (CVD), including coronary artery disease, stroke, atherosclerosis, and peripheral vascular disorders. The pathogenic role of homocysteine in cardiovascular health is multifactorial. It is believed to exert toxic

effects on the endothelium, the inner lining of blood vessels, leading to endothelial dysfunction, a key early event in the development of atherosclerosis. Homocysteine promotes oxidative stress, inflammation, and the proliferation of vascular smooth muscle cells, all of which contribute to the formation of plaques in arteries. Additionally, homocysteine interferes with the normal anticoagulant mechanisms of the blood, promoting a prothrombotic state that increases the likelihood of clot formation, further heightening the risk of heart attack or stroke. Genetic factors such as mutations in the MTHFR (methylenetetrahydrofolate reductase) gene can impair the remethylation process, especially the C677T mutation, which is associated with higher homocysteine levels in individuals with low folate intake. Lifestyle and dietary factors also play a significant role; diets low in B-vitamins, excessive alcohol consumption, smoking, and physical inactivity can contribute to elevated homocysteine levels. Measuring plasma homocysteine has become a useful tool in evaluating cardiovascular risk, particularly in individuals with a family history of premature heart disease or those who have experienced unexplained thrombotic events. While the exact threshold of concern may vary, a fasting plasma homocysteine level above 15 micromoles per liter is generally considered elevated. Management of hyperhomocysteinemia involves lifestyle modifications, dietary interventions, and supplementation with folic acid, vitamin B6, and vitamin B12 to enhance homocysteine metabolism and reduce circulating levels. Clinical studies have shown that supplementation can effectively lower homocysteine levels,

though the direct benefit on reducing cardiovascular events remains debated, as not all trials have demonstrated a clear improvement in outcomes. Nevertheless, homocysteine remains an important biomarker and modifiable risk factor, particularly in patients with other coexisting risk factors such as hypertension, dyslipidemia, and diabetes. Maintaining a diet rich in leafy green vegetables, legumes, whole grains, and lean proteins, along with regular physical activity and avoidance of tobacco and alcohol, can support healthy homocysteine metabolism and overall cardiovascular health. In conclusion, while homocysteine is not the sole determinant of cardiovascular risk, its elevated levels serve as a red flag for potential underlying metabolic or nutritional imbalances that warrant attention and correction to reduce the burden of cardiovascular disease.

3

Scientific Advancements

Role of Antioxidants in Liver Cirrhosis

Md Taukir Ali, Tanzeem Nigar

Liver cirrhosis is a chronic and progressive condition characterized by fibrosis and the loss of normal liver architecture, leading to impaired liver function. It results from various long-term insults to the liver, including chronic alcohol consumption, hepatitis B and C infections, non-alcoholic fatty liver disease (NAFLD), and autoimmune or metabolic liver diseases. One of the central mechanisms contributing to the development and progression of liver cirrhosis is oxidative stress, which results from an imbalance between the production of reactive oxygen species (ROS) and the liver's ability to detoxify these harmful compounds through antioxidants. Excessive ROS can damage hepatocytes by initiating lipid peroxidation, DNA fragmentation, and protein oxidation, thereby accelerating fibrosis and worsening liver injury. In this context, antioxidants play a crucial protective role by neutralizing ROS, reducing inflammation, and limiting the activation of hepatic stellate cells, which

are primarily responsible for fibrogenesis in the liver. Both endogenous antioxidants, such as glutathione, superoxide dismutase (SOD), and catalase, and exogenous antioxidants derived from diet or supplementation, like vitamin C, vitamin E, selenium, polyphenols, and flavonoids, contribute to maintaining redox balance within the liver. Glutathione, the most abundant intracellular antioxidant, is particularly vital for detoxifying hydrogen peroxide and lipid peroxides, and its depletion is a common finding in cirrhotic livers. Studies have demonstrated that patients with liver cirrhosis often have significantly reduced levels of circulating and hepatic antioxidants, making them more susceptible to oxidative damage. Supplementation with antioxidants has shown promising effects in preclinical and clinical studies. For instance, vitamin E, a lipid-soluble antioxidant, has been found to improve liver enzyme levels and reduce oxidative stress markers in patients with non-alcoholic steatohepatitis (NASH), a precursor to cirrhosis. Similarly, silymarin, a flavonoid complex extracted from milk thistle, possesses strong antioxidant and antifibrotic properties and has been widely used in the management of various chronic liver diseases. N-acetylcysteine (NAC), a precursor to glutathione, has been used therapeutically to replenish intracellular glutathione stores and protect against oxidative injury. Antioxidants also help in modulating the immune response and reducing chronic inflammation, which are closely linked to the fibrotic progression in cirrhosis. Furthermore, natural compounds like curcumin, resveratrol, and green tea catechins have shown hepatoprotective effects by suppressing oxidative stress, inflammation, and fibrogenic signaling

pathways. Despite the promising potential, the use of antioxidants in liver cirrhosis should be approached with caution, as not all studies have demonstrated consistent clinical benefits, and high doses of some antioxidants may have pro-oxidant effects or interact with other medications. Therefore, personalized approaches, taking into account the stage of cirrhosis, nutritional status, and comorbidities, are essential for optimizing antioxidant therapy. In conclusion, antioxidants play a pivotal role in counteracting oxidative stress and may help slow the progression of liver cirrhosis by protecting hepatocytes, reducing inflammation, and inhibiting fibrogenesis. Incorporating antioxidant-rich diets, lifestyle modifications, and targeted supplementation, under medical supervision, may provide a supportive strategy in the comprehensive management of liver cirrhosis.

4

*Scientific
Advancements*

Immunomodulators in Autoimmune Diseases

Rupsa Dutta Roy, Nandita Mondal

Immunomodulators play a pivotal role in the management of autoimmune diseases, which are characterized by an inappropriate immune response wherein the body's immune system mistakenly attacks its own cells and tissues. These diseases, including rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, type 1 diabetes, and inflammatory bowel diseases such as Crohn's disease and ulcerative colitis, involve chronic inflammation and immune dysregulation. Immunomodulators are agents that can modify or regulate one or more components of the immune system, either by enhancing or suppressing immune activity, to restore balance and reduce pathological immune responses. They include a broad range of drugs such as corticosteroids, conventional disease-modifying antirheumatic drugs (DMARDs), biologics, and small molecule inhibitors. Corticosteroids like prednisone are among the earliest and most widely used immunosuppressants that reduce

inflammation and immune activity by inhibiting cytokine production and leukocyte migration. However, long-term use is associated with significant side effects, necessitating the development of more targeted therapies. Conventional DMARDs such as methotrexate, azathioprine, and sulfasalazine work by broadly suppressing immune cell proliferation and activity, helping to control symptoms and prevent disease progression. In recent decades, biologic immunomodulators have revolutionized autoimmune disease treatment by targeting specific molecules involved in immune pathways. Tumor necrosis factor-alpha (TNF- α) inhibitors such as infliximab, adalimumab, and etanercept are highly effective in treating rheumatoid arthritis, psoriatic arthritis, and inflammatory bowel diseases by neutralizing a key pro-inflammatory cytokine. Other biologics like rituximab (targeting CD20 on B cells), abatacept (inhibiting T-cell co-stimulation), and tocilizumab (blocking the IL-6 receptor) offer more tailored options based on the underlying immune pathology. Janus kinase (JAK) inhibitors such as tofacitinib and baricitinib, which interfere with intracellular signaling involved in cytokine production, represent a newer class of small molecule immunomodulators with oral administration advantages. The choice of immunomodulator depends on the specific disease, severity, patient characteristics, and risk of adverse effects. Monitoring is crucial, as immunosuppression can increase susceptibility to infections, malignancies, and other complications. Despite these risks, immunomodulators have significantly improved quality of life and long-term outcomes in autoimmune

disease patients by reducing flares, preserving organ function, and minimizing disability. Research continues into novel immunomodulators that offer higher efficacy with fewer side effects. For example, therapies targeting regulatory T cells, immune checkpoints, and microbiome-immune interactions hold promise for more precise modulation of immune responses. Moreover, advances in pharmacogenomics may allow for personalized immunomodulatory treatment strategies tailored to an individual's genetic profile and immune signatures. In conclusion, immunomodulators are essential in controlling the pathological immune activity that underlies autoimmune diseases. Their ability to modulate immune function—either by dampening harmful responses or restoring tolerance—makes them a cornerstone of current and future therapeutic strategies. Continued research into the immune mechanisms of autoimmunity and the development of more selective, safer immunomodulators is key to improving patient outcomes and achieving long-term remission in autoimmune disorders.

5 *Scientific Advancements*

Inhalation Therapy in COPD

Sushmita Chandra Tulshi Chakraborty

Inhalation therapy plays a central role in the management of Chronic Obstructive Pulmonary Disease (COPD), a progressive respiratory disorder characterized by airflow limitation, chronic inflammation, and structural changes in the lungs, primarily caused by long-term exposure to harmful particles or gases, most commonly cigarette smoke. Inhalation therapy is preferred over systemic treatment because it delivers medications directly to the lungs, ensuring a faster onset of action, enhanced local efficacy, and reduced systemic side effects. The main classes of inhaled medications used in COPD include bronchodilators, corticosteroids, and combination therapies. Bronchodilators, such as short-acting beta-2 agonists (SABAs) like salbutamol and long-acting beta-2 agonists (LABAs) such as salmeterol and formoterol, relax airway smooth muscles, reduce resistance, and improve airflow, thereby relieving breathlessness and improving exercise tolerance. Anticholinergics like ipratropium (short-acting) and tiotropium (long-acting) also provide bronchodilation

by blocking muscarinic receptors and reducing vagal-mediated bronchoconstriction. In more severe or uncontrolled cases, combination inhalers containing both LABAs and long-acting muscarinic antagonists (LAMAs) are often prescribed to enhance bronchodilation synergistically. For patients with frequent exacerbations or high levels of eosinophilic inflammation, inhaled corticosteroids (ICS) like fluticasone or budesonide are added to reduce airway inflammation, mucus production, and the risk of exacerbations. Triple therapy, combining LABA, LAMA, and ICS in a single inhaler, has shown to significantly improve lung function, reduce exacerbation frequency, and enhance quality of life in selected patients. The effectiveness of inhalation therapy largely depends on the correct choice of device and proper inhalation technique. Various inhaler devices such as pressurized metered-dose inhalers (pMDIs), dry powder inhalers (DPIs), soft mist inhalers (SMIs), and nebulizers are available, and the selection is often individualized based on patient factors such as age, hand-breath coordination, inspiratory flow, and cognitive ability. Patient education on correct inhaler usage is crucial, as poor technique can lead to suboptimal drug delivery and reduced clinical benefit. Nebulized therapy, though typically reserved for severe cases or acute exacerbations, provides an alternative means of drug delivery for patients who have difficulty using inhalers effectively. Advances in inhalation technology, including breath-actuated inhalers and smart inhaler systems with digital monitoring, aim to improve adherence, optimize dosing, and track treatment

outcomes. Adherence to inhalation therapy remains a significant challenge in COPD management, often affected by complex regimens, side effects like oral thrush or hoarseness (with ICS), and patients' misperceptions about the chronic nature of the disease. Regular follow-up, inhaler technique assessment, and patient counseling are essential components of comprehensive COPD care. Inhalation therapy not only improves symptoms like dyspnea and cough but also helps reduce the frequency and severity of exacerbations, slow disease progression, and improve overall health status and functional capacity. In conclusion, inhalation therapy is a cornerstone of COPD management, offering targeted, effective, and individualized treatment options that significantly enhance patient outcomes when appropriately prescribed and used with good technique and adherence.

6 *Scientific Advancements*

Mucoadhesive Systems for Oral Ulcers

Riya Pal, Arkendu Chatterjee

Mucoadhesive drug delivery systems have emerged as a promising therapeutic approach for the management of oral ulcers, offering site-specific, prolonged drug retention and improved therapeutic efficacy. Oral ulcers, which may result from trauma, infections, systemic diseases, or idiopathic conditions such as recurrent aphthous stomatitis, cause significant discomfort, pain, and impaired oral functions like eating and speaking. Conventional topical treatments, such as gels, rinses, or ointments, often suffer from poor adhesion to the moist oral mucosa and are easily removed by saliva, tongue movement, and swallowing, leading to frequent reapplication and reduced effectiveness. Mucoadhesive systems overcome these limitations by adhering to the mucosal surface through physical and chemical interactions between the bioadhesive polymers and mucin layer of the mucosa, ensuring sustained contact and localized drug release. These systems are typically formulated using natural, semi-

synthetic, or synthetic polymers such as chitosan, carbopol, hydroxypropyl methylcellulose (HPMC), sodium alginate, and polyacrylic acid, which possess strong mucoadhesive properties and biocompatibility. Various dosage forms, including films, patches, tablets, gels, and buccal discs, have been developed to deliver anti-inflammatory, analgesic, antimicrobial, or wound-healing agents directly to the ulcer site. For instance, mucoadhesive buccal films containing corticosteroids like triamcinolone acetonide or hydrocortisone can effectively reduce inflammation and pain by releasing the drug gradually over time at the lesion site. Similarly, antimicrobial agents such as chlorhexidine or amlexanox incorporated into mucoadhesive systems help control secondary infections and accelerate healing. One of the key advantages of mucoadhesive systems is their ability to provide a controlled and sustained drug release profile, reducing dosing frequency and enhancing patient compliance. Additionally, they offer a protective barrier over the ulcer, shielding it from mechanical irritation, microbial invasion, and environmental insults, thus promoting faster healing and symptom relief. Recent advancements include the use of novel smart polymers that respond to environmental stimuli like pH, temperature, or ionic strength to enhance drug release and mucoadhesion. Nanoparticle-loaded mucoadhesive systems and bioresorbable scaffolds are also being explored for improved bioavailability and therapeutic outcomes. Despite their potential, some challenges remain, such as ensuring sufficient adhesion time under dynamic oral conditions, patient comfort, taste masking,

and ease of application. Research continues to focus on optimizing polymer combinations, improving mechanical strength and flexibility of dosage forms, and incorporating multifunctional agents that can offer combined anti-inflammatory, analgesic, and regenerative effects. Clinical studies have demonstrated the efficacy of mucoadhesive systems in significantly reducing ulcer size, pain scores, and healing time compared to conventional therapies. Furthermore, their application extends beyond ulcer treatment to other oral pathologies such as mucositis, candidiasis, and periodontal disease. In conclusion, mucoadhesive systems represent a highly effective and innovative approach for the localized treatment of oral ulcers, offering advantages in drug stability, site-specific action, prolonged retention, and patient adherence. Continued research and development in this area hold promise for even more advanced, patient-friendly, and therapeutically potent solutions for oral mucosal disorders.

7

Scientific Advancements

Antibiotic Resistance in Tuberculosis

Suman Mali, Moloy Roy

Antibiotic resistance in tuberculosis (TB) represents a critical global health challenge, threatening the control and eradication of one of the world's deadliest infectious diseases. Tuberculosis, caused by *Mycobacterium tuberculosis*, primarily affects the lungs but can also impact other organs, and it is typically treated with a combination of antibiotics over a six-month period. However, improper use of these drugs—such as incomplete treatment, incorrect prescribing, poor-quality medications, and patient non-adherence—has led to the emergence of drug-resistant TB strains. Multidrug-resistant tuberculosis (MDR-TB), defined as resistance to at least isoniazid and rifampicin, the two most potent first-line anti-TB drugs, poses a significant threat to public health. Even more alarming is extensively drug-resistant TB (XDR-TB), which is resistant to isoniazid, rifampicin, any fluoroquinolone, and at least one of the second-line injectable drugs like amikacin or capreomycin. These forms of resistance drastically reduce the efficacy of standard treatment regimens, require longer and more toxic therapy, and are

associated with higher rates of treatment failure and mortality. The mechanisms of antibiotic resistance in TB involve chromosomal mutations that alter drug targets or affect drug activation pathways, as *M. tuberculosis* lacks plasmid-mediated resistance, which is common in other bacteria. For instance, mutations in the *rpoB* gene are responsible for rifampicin resistance, while alterations in *katG* and *inhA* genes lead to isoniazid resistance. The bacterium's thick, waxy cell wall and its ability to persist in a dormant state within macrophages further complicate treatment by reducing drug penetration and activity. Diagnostic challenges also contribute to the spread of resistant TB, as conventional culture-based drug susceptibility testing is slow, often taking weeks, allowing transmission of resistant strains to continue unchecked. Newer molecular diagnostic tools such as GeneXpert MTB/RIF and line probe assays have improved the rapid detection of resistance, particularly for rifampicin, enabling faster initiation of appropriate therapy. However, access to such diagnostics remains limited in many high-burden, resource-poor settings. Tackling antibiotic resistance in TB requires a multifaceted approach that includes ensuring strict adherence to treatment regimens through directly observed therapy (DOT), improving access to quality diagnostics and second-line drugs, promoting research into new TB medications, and strengthening health systems to monitor and manage drug resistance. Recent advancements include the development of shorter and less toxic MDR-TB regimens incorporating drugs like bedaquiline, delamanid, and pretomanid, which have shown promise in

clinical trials. Public health policies must also focus on TB prevention through vaccination, contact tracing, and addressing social determinants such as poverty, overcrowding, and malnutrition. Furthermore, global collaboration and investment are crucial, as TB antibiotic resistance knows no borders and poses a threat even in countries with previously low disease incidence. In conclusion, antibiotic resistance in tuberculosis significantly undermines efforts to control the disease and demands urgent attention through scientific innovation, public health commitment, and patient-centered care. Only through coordinated global action can we hope to curb the rise of drug-resistant TB and work towards its eventual elimination.

8 *Art & Literature* Paintings



Silent Companions

~ Rupsa Dutta Roy

This watercolour painting captures a nostalgic still life scene featuring a kerosene lantern, a glass bottle, a flashlight, and a matchbox — evoking memories of simpler, rustic times before electricity ruled the night.

The Tender Gaze

~Pratyushi De

This vibrant painting depicts a loving couple, their faces close, hinting at a tender moment or an impending kiss, framed by lush green foliage.



9 *Art & Literature*

Prose & Poetry

Whispers in the Green

~ Priya Barman

The forest had always been a place of peace for Aarya. A stretch of lush green tucked away from the chaos of the world, where sunlight filtered through the tall sal trees and the wind hummed like an old lullaby. As a child, she had wandered through those woods with her grandfather, who used to say, “If you listen closely, the trees speak. They carry the memory of the land.”

Years passed, and Aarya became a botanist. Life in the city dimmed the magic of those early days, but when her grandfather passed away, she returned to the village and to the woods that had cradled her childhood. She wanted to find something—perhaps a memory, perhaps meaning. Or maybe, she just wanted to hear those whispers again.

One misty morning, she walked deeper into the forest than she ever had before. The air was cool and heavy with the scent of wet earth. Her boots made soft thuds on the moss-covered trail. Birds chirped overhead, but underneath that, there was something else—a faint rustle, a whispering hush that danced between the leaves. It was as if the forest was breathing, not just alive but watching.

She paused by a tall banyan tree, its roots twisted like ancient stories. There, beneath the shade, she found something strange: an old journal wrapped in cloth and tucked into the tree’s hollow. She opened it slowly. The ink was faded but still readable. Her grandfather’s handwriting.

“The forest speaks when the heart is quiet. There is a rhythm in the green. I’ve heard voices—not ghosts, but guardians. They whisper truths we forget in the noise of the world.”

Aarya's breath caught. Page after page described strange encounters—glowing fungi that pulsed like heartbeats, deer that stood still and stared as if they recognized him, dreams where the trees spoke in riddles. She could almost hear his voice as she read.

Suddenly, a breeze stirred the leaves around her. A soft whisper—real, or imagined? She closed her eyes and listened. The wind rustled through the branches, carrying words she couldn't quite grasp, but the feeling was unmistakable: welcome, memory, presence.

As the sun dipped, turning the canopy golden, Aarya sat beneath the banyan and whispered back. She told the trees about her life, about the lab reports, the deadlines, the loneliness. She spoke until her voice cracked, and the silence of the forest held her like a warm blanket.

That night, back in her grandfather's old cottage, Aarya placed the journal on his empty writing desk. She didn't have all the answers, but something had changed. The forest hadn't just remembered her. It had responded.

From that day on, she walked the green paths not as a visitor, but as part of the rhythm. And when the wind rustled, she listened—not with ears, but with the heart her grandfather had taught her to open. The whispers in the green had become a part of her, and she knew now—they had always been there, waiting.

Echoes in the Forest of Being

~ Gopal Das

In the hush of the dawn, where the wild roots cling,
A soul walks bare with a quiet offering.
Leaves murmur truths that the heart can't deny,
And branches bend low to whisper the sky.

Shadows breathe stories from lifetimes ago,
Of sorrow and wonder, of ebb and of flow.
Each rustle, a memory the silence still keeps,
A forest of being where the universe sleeps.

The moss knows the weight of forgotten dreams,
And the stream sings of hope in silver streams.
Between pulse and stillness, thought and unseen,
Awakens the echo of all that has been.

Not lost, but returning, the self softly calls,
Through thickets of doubt and invisible walls.

And deep in that green where the heart starts to sing—
The forest becomes everything, everything.

Green Thoughts

~ Sonali dash

The garden behind Anirban's cottage was not spectacular by any means. No rare orchids bloomed, no sculpted hedges framed the view. It was just a patch of earth, alive with wild grass, scattered marigolds, and a guava tree that leaned a little to the left. But to him, it was more than enough—it was a sanctuary. After retiring from years of teaching literature, Anirban found himself surrounded by quiet. No bells, no students, no chalk dust. At first, the silence was a stranger, knocking on the doors of his mind too loudly. But slowly, he turned to the garden. Every morning, he'd sit on the worn wooden bench with a cup of tea, letting the green calm wash over him. At first, he thought he was simply observing nature. But one morning, as the dew clung to blades of grass and sunlight filtered like a dream through the leaves, he realized—nature was observing him too. He began hearing his own thoughts more clearly in that stillness. Not the usual anxieties about health or bills. These were slower thoughts—green thoughts, as he called them. Thoughts that sprouted from stillness, rooted in memory and stretching gently toward understanding. He remembered his mother's garden in Calcutta, where tulsi leaves were plucked with reverence. He remembered how his wife, Maya, used to hum Tagore songs while tending to her rose bush before illness took her away. He even remembered scolding a student once, harshly, over a misplaced comma—and regretted it more now than he did back then. The garden became a mirror. Every growing leaf was a reflection of something lost, something hoped for, something yet to be forgiven. The guava tree, bearing fruit only once in a while, reminded him of patience. The weeds that kept coming back no matter how many times he pulled them—those were his habits, his buried grudges. And the wild marigolds, blooming without permission or planning, were joy—uninvited, yet welcome. One evening, a young boy from the neighborhood climbed over the low wall and sat near Anirban. They talked about trees, insects, and how to grow tomatoes in plastic tubs. The boy came again the next day, and the next. Soon, a few more children joined, curious about the “garden uncle.” Anirban found himself teaching again—not Shakespeare or Keats, but how to plant a seed, how to listen to silence, how to grow green thoughts. One morning, Anirban looked out at his unruly patch of earth, now dotted with saplings planted by small hands. He smiled, feeling no rush, no ache of time. Just a still joy. Green thoughts, he knew now, were not just about plants. They were about growing inward, rooting deep, and reaching for light—quietly, gently, endlessly.

Elemental Embrace
(এলিমেন্টাল এমব্রেস)

~ Arijit Chowdhury

চন্দ্রনির গা ছুঁয়ে ছোটো পাহাড়ি গ্রাম “সাঁঝবেলা” যেন প্রকৃতির আঁচলে লুকানো এক খণ্ড শান্তি। পাহাড়, নদী, বাতাস আর আগুন—এই চারটি উপাদানকে ঘিরেই যেন গাঁয়ের জীবনের প্রতিটি মুহূর্ত গড়ে উঠেছে। সেই গ্রামেই থাকত মেঘলা, এক শান্ত-স্বভাবের কিশোরী, যার চোখে পাহাড়ের সবুজ, কানে নদীর কলতান, মনে বাতাসের ছন্দ, আর হৃদয়ে আগুনের আবেগ। সে বিশ্বাস করত—প্রকৃতির এই চারটি উপাদান শুধুই জড় বস্তু নয়, ওরা অনুভব করতে পারে, ভালোবাসতেও পারে। একদিন হঠাৎ প্রবল ঝড়ের রাতে গ্রামের ওপর নেমে এল দুর্যোগ। বজ্রপাত, ভূমিধস, নদীর তীরে ভাঙন—সব মিলিয়ে আতঙ্কে কেঁপে উঠেছিল সাঁঝবেলা। গ্রামের সবাই নিরাপদ স্থানে আশ্রয় নিলেও মেঘলা ছুটে গিয়েছিল নদীর ধারে, পুরোনো সেই অশ্বখ গাছটার দিকে—যার শিকড়ের ছায়ায় বসে সে ছোটোবেলা থেকে কবিতা লিখত। ঝড়ের মাঝে দাঁড়িয়ে মেঘলা বলল,

“তুমি কি রাগ করেছে আমাদের ওপর, নদী? তুমি তো ভালোবাসতে আমাদের মাঠ, আমাদের গান।”

সে কথা শেষ হতেই এক মৃদু বাতাস বয়ে গেল, যেন কেউ তার কানের কাছে ফিসফিস করে বলল, “তোমরা ভুলে যাচ্ছে আমাদের কথা, কিন্তু আমরা ভুলিনি। আমরা কষ্ট পাই, মেঘলা।”

তারপর নদীর জল একটু একটু শান্ত হতে লাগল, ঝড়ের বেগ কমে এল। সকালের রোদ ছুঁয়ে গেল তার ভেজা মুখ।

পরদিন সকালেই গ্রামের elders মেঘলাকে ডেকে বলল, “তুমি তো যেন প্রকৃতির সঙ্গে কথা বলতে পারো রে। তুমি ওদের মনের কথা বোঝো।”

সেই থেকে মেঘলা প্রকৃতি আর মানুষের মাঝে সেতুবন্ধনের কাজ শুরু করল। শিশুদের শেখাত কিভাবে নদীকে সম্মান করতে হয়, কীভাবে আগুনকে ব্যবহার করতে হয় জ্ঞান আর আলো পেতে, না যে ধ্বংসে। পাহাড়কে কিভাবে ক্ষত না করে জীবন গড়া যায়, আর বাতাসকে বিষ না বানিয়ে নিঃশ্বাস নেওয়া যায় নির্ভয়ে।

বছর ঘুরতে না ঘুরতেই সাঁঝবেলা বদলে গেল। ঝড় এলেও ক্ষতি হতো না, পাহাড় হাসত, নদী গাইত গান, বাতাসে থাকত শিশুরা দৌড়ানোর শব্দ।

মেঘলা বুঝে গিয়েছিল—এই চার উপাদান তার বন্ধু নয় শুধু ভালোবাসা। এক অবিচ্ছেদ্য আলিঙ্গন, যেখানে মানুষ আর প্রকৃতি একে অপরকে জড়িয়ে ধরে।

প্রকৃতির সেই গভীর ভালোবাসাই ছিল মেঘলার জীবনের সত্য। নামহীন ভাষায়, ছায়ার মতো আলিঙ্গনে, প্রকৃতির হৃদয়কে সে ছুঁতে পেরেছিল।

সেই ছিল তার—Elemental Embrace।

এক নিঃশব্দ ভালোবাসা, যা শুধুই অনুভব করা যায়, বলা যায় না।

The Unfolding Bloom

~Bristi Das

In silence deep where shadows play,
A hidden seed begins its way.
No trumpet sound, no grand parade,
Just gentle light and earth's embrace.

Beneath the soil, it dares to rise,
To touch the blue of distant skies.
Each petal wrapped in dreams unknown,
Each breath a step it's claimed alone.

No eye had seen its silent fight,
Through darkest hours, toward the light.
But morning came—and with it, grace,
The bloom appeared with softest face.

A whisper in the garden's air,
A story born of love and care.
It did not rush, it did not fear—
Its moment came, and it stood clear.

So, let your soul, like flowers, grow,
Through storms that only you may know.
For beauty lives in time and room—
The strength within an unfolding bloom.

অন্তরের স্রোত

~ Payel Ghosh

নীরব রাতে, নিঃশব্দ বুকে,
বয়ে চলে এক গোপন সুখে।
জলছবির মতো, হালকা স্বপ্ন,
অন্তরে গাঁথা এক গোপন সংগম।

শব্দহীন ভাষা, কাঁপা কণ্ঠে,
বলতে চায় যে—থেমে গিয়েছে।
তবু বয়ে চলে, বিরামহীন,
ভিতরটায় যেন নদীর কুহরিণ।

বেদনার জল, ভালবাসার ঢেউ,
মিশে যায় তাতে অতীতের নেউ।
হাসি, কান্না, স্মৃতি ও ব্যথা—
সবই যেন সেই স্রোতে পাথা।

এই স্রোত নেই কোনো গন্তব্যে বাঁধা,
এ এক অন্তর থেকে অন্তরে যাত্রা।
যার গভীরতা বুঝে ক'জন?
তবু সে বয়ে চলে আপন মন।

10

Current affairs

Ongoing Conflicts: The Israel-Hamas War

Prabal Bakly (3rd year)

The Israel-Hamas conflict, one of the most volatile and tragic confrontations in modern geopolitics, has once again erupted into intense violence, drawing global attention to the deep-rooted tensions that have plagued the region for decades. Originating from the long-standing Israeli-Palestinian conflict, this war reflects not only territorial disputes but also deep political, religious, and humanitarian crises. The latest chapter in the conflict began in October 2023, when Hamas, the Palestinian militant organization governing the Gaza Strip, launched an unprecedented attack on southern Israel, resulting in a significant number of civilian casualties. In retaliation, Israel launched a massive military operation in Gaza, targeting Hamas infrastructure, but also resulting in extensive civilian deaths, displacement, and destruction. The cycle of attack and retaliation has triggered international outcry and growing calls for ceasefire, but the path to peace remains fraught with complications. The densely populated Gaza Strip, already under a blockade for

years, is now facing severe humanitarian distress with shortages of food, medicine, electricity, and clean water. Hospitals are overwhelmed, thousands have been killed or wounded, and millions displaced. Meanwhile, Israel faces its own trauma, with the memory of surprise attacks shaking national security, prompting a firm military stance against what it sees as terrorism. This war is not simply a bilateral issue; it draws in global powers and influences regional stability. The United States, traditionally a close ally of Israel, has supported its right to self-defense while calling for humanitarian aid to Gaza. Conversely, several Middle Eastern countries, as well as global human rights organizations, have criticized the disproportionate use of force and the suffering inflicted upon Palestinian civilians. The war has reignited debates about the legality of occupation, the failure of the two-state solution, and the role of extremist ideologies on both sides. It also reflects the failure of diplomacy and decades of stalled peace processes that have left generations of Israelis and Palestinians in a cycle of fear, resentment, and violence. In addition, the conflict has spilled beyond borders, sparking protests, online polarization, and a rise in anti-Semitic and Islamophobic rhetoric worldwide. While temporary ceasefires have been brokered for humanitarian aid, lasting peace seems elusive as both sides continue to suffer loss and devastation. The Israel-Hamas war is not only a political crisis but a profound humanitarian tragedy, where innocent lives pay the price for entrenched hostilities. It underscores the urgent need for a renewed, honest international commitment to peacebuilding, mutual recognition, and

sustainable dialogue. Without addressing the root causes — such as the status of Jerusalem, refugee rights, settlements, and the political fragmentation within Palestinian leadership — any truce will only be temporary. The international community must act with empathy, courage, and fairness to help end this enduring conflict. As the war continues, it is a stark reminder that until justice and coexistence are achieved, peace will remain out of reach in the land that so many call home.



11

Current affairs

Technological Advancements and Concerns: The Rise and Regulation of Artificial Intelligence

Subrata Das (2nd year)

In recent years, the rapid development and increasing integration of Artificial Intelligence (AI) have transformed nearly every sector of human activity, marking a significant technological revolution that continues to redefine the boundaries of possibility. From healthcare diagnostics and autonomous vehicles to personalized education, virtual assistants, and financial forecasting, AI has seamlessly embedded itself into the global ecosystem, offering unprecedented efficiencies, productivity, and problem-solving capabilities. However, alongside this remarkable progress, serious concerns have emerged about the regulation, ethical implications, and socio-economic consequences of AI, particularly its impact on employment and human autonomy. The expanding capabilities of AI systems, especially generative AI and machine learning

algorithms, raise critical questions about transparency, accountability, and bias. Many AI systems are "black boxes," making decisions based on data patterns without clear explanation, leading to potential risks in sectors like criminal justice, hiring, and healthcare. Moreover, concerns over privacy, misinformation, and surveillance have intensified with the deployment of AI-powered tools capable of deepfakes, facial recognition, and large-scale data mining. Ethical dilemmas surrounding AI are not hypothetical—they are immediate and real. Who is responsible when an AI system makes a harmful or biased decision? Can machines be taught morality? Should AI ever be used in military or lethal autonomous applications? These questions demand urgent regulatory frameworks, which are still lagging behind the pace of innovation. Different countries and organizations have begun drafting AI governance policies, such as the European Union's AI Act and the U.S. Blueprint for an AI Bill of Rights, but global consensus remains fragmented. In parallel, another major concern is the disruption AI poses to the global job market. While AI promises to automate repetitive and dangerous tasks, it also threatens millions of jobs in sectors like customer service, transportation, data entry, and even creative industries like writing, design, and music. The fear of mass unemployment is tempered by optimism among some experts who argue that AI will create new kinds of jobs and industries, emphasizing the need for reskilling and educational reform to prepare the workforce for a future shaped by intelligent machines. However, without proactive planning, the transition could widen income inequality, leave vulnerable populations behind, and deepen the digital divide. Furthermore, the growing reliance on AI systems raises existential concerns about human agency and dependence. If critical decisions are increasingly made by machines, where does that leave human judgment, empathy, and accountability?

The conversation around AI is no longer confined to laboratories and tech conferences—it has become a mainstream societal debate involving ethicists, policymakers, businesses, educators, and citizens alike. In essence, the rise of AI represents both an extraordinary opportunity and a profound challenge. To ensure that AI develops in alignment with human values and democratic principles, a balance must be struck between innovation and oversight, between automation and employment, and between power and responsibility. The future of AI is not predetermined; it is a narrative we must consciously write—ethically, inclusively, and wisely—before the technology outpaces our ability to guide it.

Hindustan

NEW DELHI: SATURDAY, SEPTEMBER 27, 1946.

17 Lakhs Evacuated From W. Punjab

WAYS ESSENTIAL

PATTEL ON GRAVITY OF PROBLEM

UNDISTURBED PASSAGE TO BE ENSURED

PUNJAB STATES OFFER TO ABSORB REFUGEES

Addressing a meeting of representatives of Eastern Punjab States in New Delhi on Friday convened by the Ministry of States to consider the question of protection to refugee trains through State territories, the evacuation of Muslim refugees from State territories and the resettlement of non-Muslim refugees in those States, Sardar Patel emphasized the magnitude, urgency and supreme importance of the problem and speedy evacuation and resettlement of refugees.

Sardar Patel said: "It is of the utmost importance, that this progress of evacuation should get a possible help and facility by all the means at our disposal and I should like to remind you that in this matter time is of the essence. If we cannot evacuate within as short a time as possible, we shall be faced with consequences too terrible to contemplate."

"It is, therefore, with great concern and anxiety that we have been observing recently the mounting toll of hundreds of trains which have been stranded at various points of evacuation."

"Even otherwise, our refugees on the other side were being attacked by the various elements of West Punjab, and the refugees, being led to the green and savage, British, Hindu and Muslim, were being treated with the utmost cruelty."

Sardar Vallabhbhai Patel, Minister of States, at Billa House after the meeting of the Working Committee on Thursday.

RESTORE REAL IN DELHI

GANDHIJI ASKS PEOPLE HIM TO VISIT W.

12

Current affairs

Indian General Election 2024: A New Chapter in the World's Largest Democracy

Gourab Paul (4th year)

The Indian General Election of 2024, widely regarded as the world's largest democratic exercise, concluded in early June, capturing global attention with its scale, diversity, and political significance. Spanning over seven phases and involving more than 960 million eligible voters, the election was not just a contest for power, but a monumental expression of the democratic will of the people. With over 500 million votes cast across the nation's 543 parliamentary constituencies, the 2024 election reflected India's vibrant political engagement and its deep-rooted commitment to democratic governance. The ruling National Democratic Alliance (NDA), led by Prime Minister Narendra Modi and the Bharatiya Janata Party (BJP), returned to power for a third consecutive term, although with a reduced majority compared to the 2014 and 2019 elections. The result signaled both continued support for Modi's leadership and a growing appetite for alternative

voices, as the opposition INDIA bloc—an alliance of regional and national parties—made significant electoral gains, especially in key states like Uttar Pradesh, Maharashtra, and West Bengal.

The campaign was marked by intense political rhetoric, mass rallies, digital outreach, and debates on issues ranging from economic development, national security, and job creation to inflation, social justice, and freedom of expression. Modi's campaign centered around the themes of national pride, development, and continuity of governance, while the opposition focused on alleged institutional erosion, unemployment, farmers' distress, and the need for checks on executive power. Social media played a pivotal role, with platforms like WhatsApp, Twitter (X), Instagram, and YouTube turning into battlegrounds for narratives, misinformation, and mobilization.

One of the defining aspects of the 2024 election was the record participation of women and young voters, many of whom viewed this election as a moment to shape India's future direction. The Election Commission of India ensured the smooth conduct of polling across remote and urban areas, overcoming challenges of logistics, security, and climate, especially in conflict-prone regions and during intense summer heat. Despite sporadic incidents of violence and allegations of voter suppression in some areas, the election process was largely peaceful and widely praised for its scale and transparency.

The formation of the new government has brought both continuity and change. Modi's third term is expected to focus on economic reforms, digital infrastructure, national security, and positioning India as a global power amid rising geopolitical tensions. However, the increased strength of the opposition has injected a new dynamism into parliamentary proceedings, potentially ensuring more robust debates and accountability. The election also

highlighted the rising role of regional parties and coalition politics, signaling that India's democracy is increasingly complex and multipolar.

As the world watches India's next steps, the 2024 general election stands as a testament to the strength and resilience of democratic processes in a nation of extraordinary diversity. It reinforced the principle that in a democracy, power ultimately rests with the people—and their collective voice continues to shape the destiny of the republic.



13

Current affairs

European Parliament Elections 2024: Shifting Currents in the Heart of the EU

Nishita Das (3rd year)

The European Parliament Elections of 2024, held in early June, marked a defining moment for the European Union, significantly influencing its political direction and policymaking priorities. Held every five years, the election is one of the largest democratic exercises in the world, with over 400 million eligible voters across 27 member states. This year's election was particularly crucial, as it unfolded against a backdrop of economic uncertainty, geopolitical tension due to the ongoing Russia-Ukraine war, rising concerns over climate policy, migration, inflation, digital regulation, and the growing influence of right-wing populist movements. The most striking feature of the 2024 elections was the surge of support for far-right and nationalist parties in several key countries, including France, Germany, and Italy. Parties like France's National Rally, Germany's Alternative for Germany (AfD), and Italy's Brothers of Italy capitalized on growing discontent

with the EU's green transition policies, immigration stance, and perceived bureaucratic overreach. While the centrist coalition—comprised mainly of the European People's Party (EPP), the Progressive Alliance of Socialists and Democrats (S&D), and Renew Europe—managed to retain a parliamentary majority, their margin narrowed considerably, signaling a shift in public sentiment and the growing fragmentation of the European political space. In contrast, pro-European, green, and progressive parties saw mixed results. The Greens, who had performed strongly in 2019 amid climate activism, suffered losses in several countries, particularly where economic anxieties and energy costs took precedence over environmental priorities. However, in nations like the Netherlands and the Nordic countries, green and liberal parties held their ground. Voter turnout, which had increased in 2019, remained relatively high, demonstrating that European citizens are becoming increasingly engaged with the role of the EU in their daily lives. The election's outcomes are expected to influence key legislative areas for the next five years. Among the top priorities will be revisiting climate commitments under the European Green Deal, re-evaluating migration and asylum policies in light of growing border pressures, strengthening defense capabilities amid the Russia-Ukraine conflict, and addressing inflation and economic inequality across the bloc. The new European Parliament will also play a crucial role in shaping digital regulation, AI governance, trade policies, and the enlargement agenda regarding candidate countries such as Ukraine, Moldova, and the Western Balkans. Another notable aspect was the shift in political discourse. The presence of more vocal Eurosceptic and nationalist Members of the European Parliament (MEPs) is expected to influence debates, slowing down consensus-driven decision-making. This may challenge the European

Commission's ability to push through ambitious reforms quickly, potentially leading to a more contested and polarized political environment within the EU's institutional framework. In conclusion, the European Parliament Elections of 2024 served as a critical barometer of political mood across the continent. While the core of the EU remains intact, the rise of far-right parties and the reshaping of parliamentary alliances signal that the Union is entering a more complex, politically diverse, and perhaps contentious phase. The choices made in this election will echo throughout the EU's institutions and policies in the years to come, shaping the future of Europe in an increasingly unpredictable world.



14

Current affairs

The Race to the White House: U.S. Presidential Election Campaign Heats Up

Sangita Shit (4th year)

As the 2024 U.S. Presidential Election drew nearer, the campaign landscape intensified with full momentum, thrusting the nation into a period of political fervor, televised debates, and high-stakes primaries. The months leading up to the election were marked by a sharp increase in public engagement, strategic messaging, and polarizing discourse, as candidates from both major parties vied to secure their positions and define the key issues dominating the national agenda. Against a backdrop of economic recovery, cultural divisions, and global instability, the campaign trail became a battleground for competing visions of America's future. On the Republican side, former President Donald Trump re-emerged as a dominant force, galvanizing his base with promises of economic revival, strong border enforcement, and a return to "America First" policies. Despite facing legal challenges and internal criticism from moderate conservatives, Trump's presence

loomed large over the primaries. Rivals such as Florida Governor Ron DeSantis and former U.N. Ambassador Nikki Haley positioned themselves as alternatives with strong records, but struggled to chip away at Trump's loyal voter base. The Republican primaries reflected the party's internal struggle between traditional conservatism and populist nationalism, a dynamic that played out vividly during debates where topics like crime, immigration, and foreign policy were front and center. Meanwhile, on the Democratic side, President Joe Biden sought a second term, emphasizing achievements from his first term such as infrastructure investments, climate action, and support for Ukraine. Despite concerns about his age and approval ratings, Biden maintained strong institutional backing within the Democratic Party. The Democratic primaries were less contested, but growing progressive voices continued to push for stronger action on student loan forgiveness, healthcare access, and economic equality. The Biden campaign leaned on unity, stability, and experience, attempting to contrast sharply with the tumultuous rhetoric emerging from the Republican field. Televised debates became key moments in the campaign, drawing millions of viewers and influencing public opinion. Candidates clashed over gun control, inflation, reproductive rights, climate change, and America's role on the world stage. Media coverage played a pivotal role in shaping narratives, with social media platforms further amplifying messages—both factual and misleading. Fact-checking and digital misinformation became recurring concerns, as viral clips and out-of-context statements shaped political discourse in real time. Beyond policy, personality and trustworthiness became defining factors. Voters weighed candidates not only by their platforms but by their perceived leadership qualities, emotional resonance, and vision for a deeply divided country. As campaign ads flooded airwaves and

rallies surged in key battleground states, both parties intensified outreach to crucial demographics—young voters, suburban women, minority communities, and swing state independents. In summary, the 2024 U.S. Presidential Election campaign became a reflection of America's evolving identity and the high-stakes choices before it. With primaries concluding and national conventions on the horizon, the campaign entered its final stretch—a test of democracy, strategy, and the enduring question of what kind of nation the United States aspires to be.



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Current affairs

Global Economic Crossroads: Inflation, Interest Rates, and Uncertainty

Pijush Das (3rd year)

In 2024, the world economy stood at a critical crossroads, grappling with persistent inflation, shifting interest rate policies, and the looming specter of economic slowdowns or recessions. These interconnected factors created a climate of uncertainty for governments, investors, and ordinary citizens alike, as central banks across major economies attempted to balance economic growth with financial stability. The year was defined by delicate decisions on monetary policy, volatile energy prices, and the fragile recovery from years of pandemic-driven disruptions. Global inflation remained a dominant concern, with many countries experiencing continued price pressures despite earlier attempts at stabilization. Factors such as lingering supply chain disruptions, geopolitical conflicts (most notably the Russia-Ukraine war and tensions in the Middle East), and climate-related agricultural shocks contributed to rising food and commodity prices. Consumer costs for basic necessities such as housing, transportation, and groceries

remained elevated, especially in developing economies where fiscal space for subsidies or relief programs was limited. In response, central banks—including the U.S. Federal Reserve, the European Central Bank (ECB), the Bank of England, and others—continued to make critical interest rate decisions. Some, like the Fed, adopted a cautious approach by slowing the pace of hikes while closely monitoring inflationary trends and labor market conditions. Others, facing more stubborn inflation or currency instability, opted for further rate increases. These decisions, though aimed at tempering inflation, had ripple effects across global markets. Higher borrowing costs began to dampen business investment, real estate activity, and consumer spending, raising concerns about stalling economic momentum. Meanwhile, fears of recession loomed large in economic discourse. While some countries posted modest GDP growth, many advanced economies showed signs of fatigue. Manufacturing slowdowns, reduced retail spending, and weakening investor confidence suggested that recessionary pressures were no longer hypothetical. In particular, Germany, the U.K., and parts of Asia reported contraction in key industrial sectors, prompting governments to consider fiscal stimulus options or policy interventions. Global financial institutions such as the IMF and World Bank issued cautious outlooks, highlighting both downside risks and the need for structural resilience. One of the most volatile and influential factors in this economic mix was energy pricing. Oil and gas markets fluctuated due to ongoing supply uncertainties and geopolitical instability. The shift toward renewable energy was notable, but short-term dependence on fossil fuels, especially in colder months and industrial sectors, kept prices unstable. OPEC+ decisions, sanctions on Russian energy exports, and climate-related disruptions contributed to price shocks that impacted everything from electricity bills to transportation

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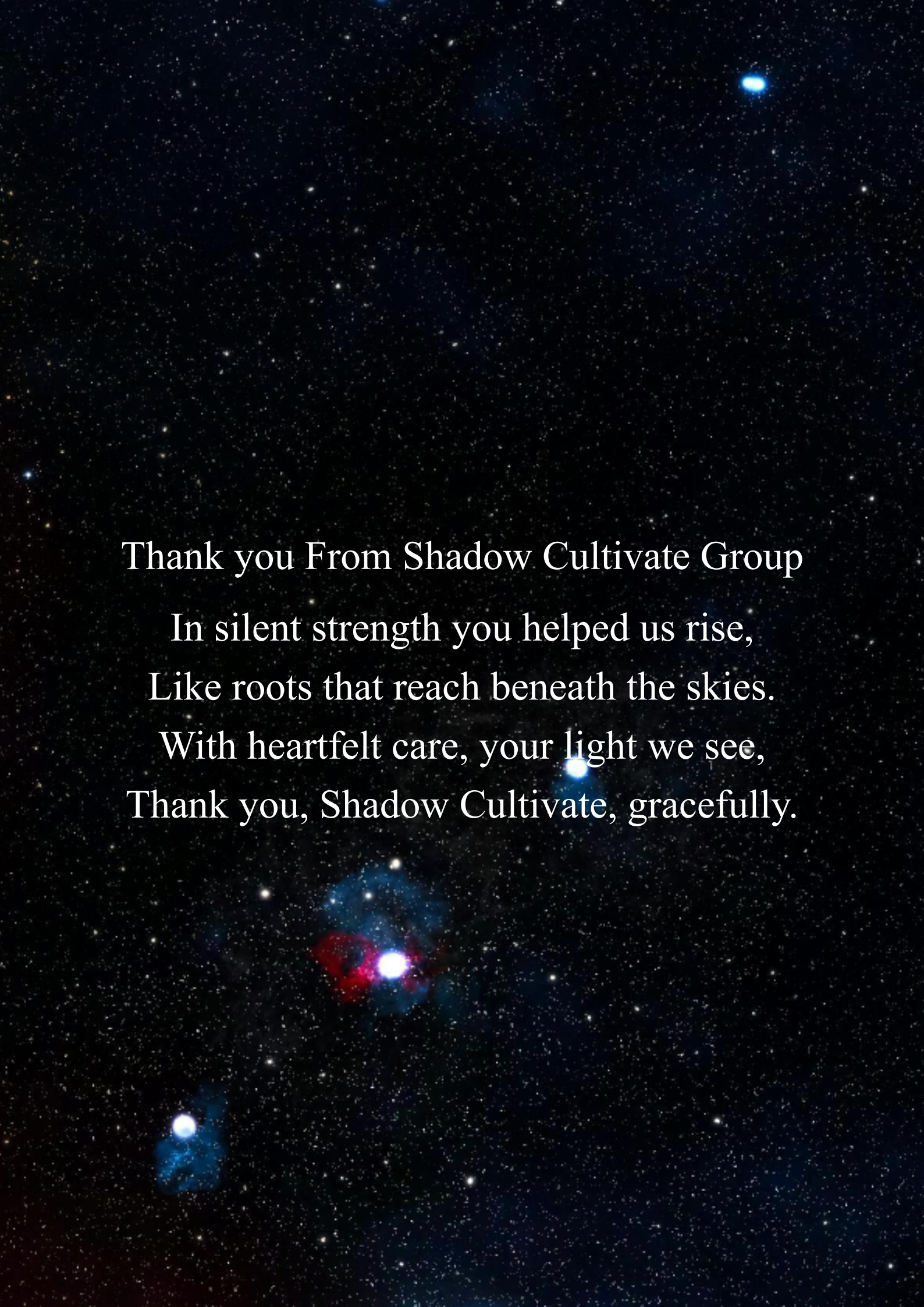
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Pharmacy Entrance Exams & Cut-offs (2024–25 Academic Year)

Exam Name	Level	Cut-off (2024–25)
GPAT 2024	M.Pharm Admission	UR: 96.15% OBC: 90.09% EWS: 90.70% SC: 75.43% ST: 54.17% PwBD: 45–55% (approximate category-wise percentiles)
GPAT 2024 (Marks)	M.Pharm Admission	General: 240–250 EWS: 210–220 OBC: 190–200 SC/ST: 160–170 (approximate)
GujCET + Board Merit	B.Pharm Admission	Cut-offs vary by institute; top ranks require percentile above 90–95 combined with strong Class 12 scores
MHT-CET (PCB)	B.Pharm Admission	High percentile (typically 95–100) needed for top institutes in Maharashtra
WBJEE (Paper-II Only)	B.Pharm Admission	Pharmacy Merit Rank (PMR) needed; general category ranks typically within top 3,000–5,000 for good institutes
BCECE (Bihar)	B.Pharm Admission	Cut-off ranks vary; general category typically under 500 for government colleges
DDCET (Diploma to Degree)	B.Pharm Lateral Entry	Seats filled based on diploma merit rank; cut-off varies depending on seat availability, category, and institute



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With heartfelt care, your light we see,
Thank you, Shadow Cultivate, gracefully.