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**Record 1 of 30**

**Title:** COVID-19 pandemic and community resilience: Study of gated and non-gated communities of Gurugram, India

**Author(s):** Yadav, S (Yadav, Sumedha)

**Source:** CITIES **Volume:** 161 **Article Number:** 105834 **DOI:** 10.1016/j.cities.2025.105834 **Early Access Date:** MAR 2025 **Published Date:** 2025 JUN

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**Abstract:** The disruption caused by the COVID-19 pandemic in the functioning of the global community has made it a global disaster, necessitating strengthening communities' resilience capacities to respond to the crisis. The study adopts a neighborhood-based approach, focusing on residential communities, which are the first to experience and respond to disasters. A questionnaire survey of 180 households in gated and non-gated residential communities was conducted to assess their perceptions of resilience. The residential communities identified as containment zones by the district administration have been considered for the study. A principal component analysis was performed based on responses, demonstrating five factors explaining 67.41 % of the variance. The factors are characterized as leadership, preparedness, place attachment, social trust, and collective

efficacy, which align with the dimensions of community resilience as per CCRAM (Conjoint Community Resilience Assessment Measure), a perception-based resilience assessment measure. A comparison between the two community types is made by calculating a mean perception score for each dimension considered for both Gated and Non-Gated Communities. The findings reveal a significant difference in resilience perception between the two community types. The factors contributing to positive resilience perceptions are further examined. Perceptionbased responses are used to compute community resilience scores, and regression analysis is performed to assess the influence of socio-demographic and economic variables. The findings indicate that community resilience is positively influenced by the duration of residence, the highest level of education, and annual family income from all sources. The study highlights the importance of strengthening grassroots networks in fostering resilience by supporting initiatives that promote social cohesion and collective actions.

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**Record 2 of 30**

**Title:** The Aporicity of Time and Memory

**Author(s):** Thaliath, B (Thaliath, Babu)

**Source:** SOPHIA **DOI:** 10.1007/s11841-025-01059-9 **Early Access Date:** MAR 2025 **Published Date:** 2025 MAR 26

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**Cited References:** Aristotle, 1995, Politics
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**Cited Reference Count:** 10

**Abstract:** In his magnum opus Temps et R & eacute;cit, Paul Ricouer diagnoses three aporias of time in Husserl's phenomenology. Of these, the first aporia is the most decisive, as it serves as the basis for the other two aporias. The first aporia identified by Ric oe ur refers to the retentional and protentional extension of "now" (jetzt), the present. The aporia of the present has its origin in the contrary conceptions of time by Aristotle and St. Augustine. The Aristotelian world time, as represented chiefly in the harmonious movement of celestial bodies, seems to contradict the Augustinian conception of time, namely the time of soul - as distentio animi. In Husserl's attempt to extend the punctiform "now" by a retentional and protentional time-consciousness, Ric oe ur sees the inevitable aporia of a fusion of two modally opposed representations of time, namely, movement and stasis. In my paper I try to show how the first aporia of time identified by Ric oe ur can be seen not merely as an aporia of the present (Gegenwart), but as the aporia of the presentification (Vergegenw & auml;rtigung) of secondary memory, as represented in Husserl's propaedeutic explanation of the retentional extension of a time-object (Zeitobjekt) in subjective time-consciousness. The time-object and its intentional in-existence in consciousness, which is primarily conceived by Brentano in a temporal 'original association' and later by Husserl in retentional and protentional extension, is thereby extended in a mnestic and furthermore historical framework. It is primarily an attempt to establish the existential autonomy of the in-existent time-object in consciousness. Memory as an in-existent temporal phenomenon seems to contradict the tacitly assumed primacy of noesis or noetic construction in phenomenology and thus illustrate its equally autonomous presentification in consciousness in the form of a temporal aporia.

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**Author Keywords:** Philosophy of Mind; Phenomenology; Phenomenology of Inner Time-Consciousness; Epistemology; Edmund Husserl; Franz Brentano; Paul Ricoeur; Retention and; Protention; Noema and Noesis; Intentionality; Intentional in-Existence; Referentiality; Temporal Phenomena; Memory; Aporias of Time; Hyletic Phenomenology; Theory of Perception; Time Perception; Temporality; Time Philosophies; Aristotle; St. Augustine; Immanuel Kant

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**Record 3 of 30**

**Title:** Walking as performing in the city: dialogues and ethnographic encounters

**Author(s):** Pathak, P (Pathak, Priyanka)

**Source:** STUDIES IN THEATRE AND PERFORMANCE **DOI:** 10.1080/14682761.2025.2478716 **Early Access Date:** MAR 2025 **Published Date:** 2025 MAR 19

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**Cited Reference Count:** 24

**Abstract:** This article explores Yamuna Walk (2007) by Atul Bhalla, an event where artists walked alone at waste and garbage sites in New Delhi. Unlike conventional theatre or performance making, there were no stage props, and the performance was not rehearsed or predetermined. The walk was an embodied and immersive experience, contrasting with leisurely or touristic walks at historical sites. Walking at such marginalized sites is an ethnographic encounter where artists and citizens take time to immerse themselves in the landscape through walking. This article establishes how an undirected and unrehearsed walk at waste/garbage sites exposes state-sponsored discrimination but also challenges the undemocratic nature of the performance apparatus, which is usually concentrated in urban hubs. With their temporal nature, the walks intertwine historical time and trace the phenomenological experiences of everyday life. This article queries the possibility of understanding urbanization and the expansion of Delhi through walks, especially at landfills or waste sites. It explores how unevenness in urbanization and the city's expansion can be observed or assessed through this medium. The

choice of a waste site, and the risks involved in walking at such sites in the city, are also critical factors in how Yamuna Walk highlights uneven urbanization.

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**Language:** English

**Document Type:** Article; Early Access

**Author Keywords:** Walking as performance; New Delhi; waste sites; ecological inclusivity; embodiment; site-specific

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**Record 4 of 30**

**Title:** Differential rhizosphere soil nutrient use strategy of invasive and native shrub species in oak, pine, and oak-pine mixed forest ecosystems of the Himalaya

**Author(s):** Hansda, P (Hansda, Priya); Kumar, S (Kumar, Shailendra); Garkoti, SC (Garkoti, Satish Chandra)

**Source:** RHIZOSPHERE **Volume:** 33 **Article Number:** 101021 **DOI:** 10.1016/j.rhisph.2025.101021 **Published Date:** 2025 MAR

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**Abstract:** Vegetation types contribute differently to the soil nutrient status; however, this study aims to investigate the rhizosphere soil nutrient use strategy of invasive (Ageratina adenophora) and native (Berberis asiatica and Rubus ellipticus) shrub species under varied soil nutrient regimes. The rhizosphere soil samples of A. adenophora, B. asiatica, and R. ellipticus were collected from the upper (0-10 cm) and lower (10-20 cm) soil depths in oak, pine, and oak-pine mixed forest stands. Bulk soil was collected as control in the selected forest stands. Linear Mixed Model (LMM) and analysis of variance demonstrated that most soil properties were significantly ($p < 0.05$) higher in the rhizosphere soil of A. adenophora than in that of B. asiatica and R. ellipticus. Specifically, soil organic carbon (SOC), total nitrogen (TN), microbial biomass carbon (MBC), nitrogen (MBN), and dehydrogenase enzyme activity (DHA) were higher in the rhizosphere of invasive A. adenophora than in that of native B. asiatica and R. ellipticus in oak forest. In contrast, the rhizosphere soil of native shrubs retained higher TN, Available phosphorus, and DHA than the invasive A. adenophora in the pine forest stand. Redundancy analysis (RDA) demonstrated that the shrub species and forest stands accounted for 22.6% and 10% variance in the rhizosphere soil properties, respectively. Among the forest stands, the rhizosphere soil traits of A. adenophora were higher than the rhizosphere of native species in oak forests suggesting that nutrient-rich soil ecosystems and favourable microclimatic conditions are suited for the growth and survival of invasive species. Conversely, pine forests, which are adapted to resource co-limitation and higher temperatures may suppress the proliferation of A. adenophora, obligating A. adenophora to alter its

nutrient use strategies from nutrient acquisition in oak to nutrient conservation in pine forests. Thus, our findings suggest that mixed forests (oak and pine) should be conserved to enhance the species richness.

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**Abstract:** Despite the efficient progress achieved in the synthesis of heterocyclic compounds, accessing these molecules by combining both visible lights induced radical chemistry and multicomponent reactions is extremely demanding yet challenging. Recognizing the significant features associated with oxygen- and nitrogen-containing heterocyclic compounds, the search for these attractive molecules in nature and developing new synthetic strategies for synthesizing these molecules remain interesting domain for synthetic chemists. In

this mini-review article, we aim to demonstrate a transitory outline of the recent development achieved in the synthesis of six-membered heterocycles having oxygen and nitrogen as the major heteroatoms as well as six-membered heterocycle containing spirooxindole molecules based on visible-light-induced photochemical multicomponent reactions strategies. Besides addressing the key success of the reaction design and product developments in this promising area, we have also emphasized the major shortcomings and challenges associated with the reaction discovery in order to stimulate further succeeding investigations.

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**Title:** How Do Molecular Crowders Influence Ligand Binding Kinetics with G-Quadruplex DNA? The Role of Bound Water

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**Abstract:** Understanding the kinetics of ligand interaction with G-quadruplex DNA (GqDNA) in a crowded cell-like environment is of paramount importance in biology and pharmacology, as it elucidates the effect of molecular crowders on reaction rates governing these interactions-a process that largely remains unexplored. In this study, we investigate the binding/unbinding kinetics of a G-quadruplex stabilizing benzophenoxazine ligand, cresyl violet (CV), with a human telomeric hybrid GqDNA structure using fluorescence correlation spectroscopy (FCS) and molecular dynamics (MD) simulations. Experiments are conducted with and without 10% and 20% (w/v) ethylene glycol (EG), PEG200 and PEG6000 crowders. The steady-state fluorescence results reveal a reduction in the ligand binding affinity to GqDNA as the size and concentration of the crowders increase. FCS data further demonstrate that the crowder-induced reduction in binding affinity is primarily driven by the viscosity-induced decrease in the association rate (k +) and a competing excluded volume effect, as well as a concomitant increase in the dissociation rate (k -) of the ligand. Atomistic MD simulations highlight the key role of strong electrostatic forces between the G-tetrad and pi-stacked ligand, along with long-lived water-mediated hydrogen-bond bridges, in stabilizing the ligand/GqDNA complex in the absence of crowders. However, in the presence of EG/PEG crowders, the ligand binding mode is disrupted by hydrogen-bond interactions of the crowders with the ligand, causing rotation of the ligand's molecular plane relative to the G-tetrad. This disruption weakens the pi-stacking electrostatic forces between the ligand and the G-tetrad and breaks the long-lived water-mediated hydrogen-bond bridges between the ligand and GqDNA, destabilizing the ligand/GqDNA complex. The current investigation underscores the prominent role of hydrogen-bond interactions of EG/PEG crowders, along with other factors, in affecting the stability of the ligand/GqDNA interaction in a crowded milieu.

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**Author(s):** Kaushik, M (Kaushik, Mahesh); Tiku, AB (Tiku, Ashu Bhan)

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**Abstract:** Owing to the developments in various therapeutic modalities, cancer treatment has come a long way, including the discovery of various anticancer drugs, innovations in delivery technology, and increased personalization of treatments. Despite this, head and neck cancer (HNC) is a cancer that has eluded the current conventional treatments. To improve quality of life and preserve vital organ function in patients with HNC, there is a need for research into therapeutic regimes that would reduce the toxicity of the current therapeutic modalities. The use of a single approach has not been enough to completely eradicate this malignancy. Therefore, the use of adjuvants and combinatorial approaches, using molecules from natural compounds that have no or minimal side effects, is a growing area of research. One objective of this review was to clarify the potentiality of novel therapeutic strategies for HNC, such as the use of phytochemicals as adjuvants with chemotherapy or radiotherapy, and use of nano-formulation for therapeutic delivery. Another objective of this review was to delineate the associated challenges in the clinical application of these therapies in HNC. Possible strategies for overcoming critical issues associated with the clinical application of phytochemicals for HNC are also discussed.

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**Title:** Federated workload-aware quantized framework for secure learning in data-sensitive applications

**Author(s):** Narula, M (Narula, Manu); Meena, J (Meena, Jasraj); Vishwakarma, DK (Vishwakarma, Dinesh Kumar)

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**Abstract:** Federated Learning (FL) emerged as a leading secure, distributed learning technology based on sharing insights instead of data. The privacy-ensuring capability of FL has enabled its extensive use in Data-Sensitive Applications like healthcare and finance. However, the transmitted insights are at risk of leakage as the security of the medium cannot be guaranteed and can lead to the inference of the user data. Quantization is sometimes used to change these transmitted values to provide security but at the cost of accuracy loss in global models. Coupled with client dropouts, this increases performance loss. In this paper, we propose a Federated Workload-Aware Framework with Linear Quantization (Fed-WALQ), which layers the quantization process with an active client-selection technique based on the sustainable workload of the clients. The framework minimizes the dropout rates and compensates for the loss due to quantization. Through numerical experiments compared against traditional FL and Quantization-enabled FL over multiple datasets, the Fed-WALQ shows improvements in security over the former and accuracy over the latter. The accuracy improvement varies with the complexities of the involved datasets, while a substantial drop in straggler node percentages is seen in all cases (up to 91.8% drop).

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**Author(s):** Panneer, S (Panneer, Sigamani); Udhayakumar, P (Udhayakumar, P.); Reddy, S (Reddy, Sunita); Rashid, J (Rashid, Javaid)

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**Title:** High-low temperature switch induces formation of catalytic and cytotoxic amyloid aggregates of papain

**Author(s):** Ansari, M (Ansari, Masihuzzaman); Prajapati, KP (Prajapati, Kailash Prasad); Mittal, S (Mittal, Shikha); Mishra, S (Mishra, Shraddha); Gupta, V (Gupta, Vartika); Anand, BG (Anand, Bibin G.); Kar, K (Kar, Karunakar)

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**Abstract:** The optimal activity of most proteins is observed at physiological temperature; however, thermophilic proteins including papain show reduced activity at physiological temperature and their maximum activity is observed at elevated temperature. The question of what structural alteration in papain is materialised via such temperature decrease from higher-to-physiological condition becomes important, and it is unclear that, apart from the loss of functional conformation, what other defects are introduced via temperature drop. Here, we revealed that 65 degrees C -> 37 degrees C temperature switching causes a minimalistic conformational alteration in papain's active site geometry that not only makes it non-functional but also it entrenches an aggregation propensity and drives a phase separation into cross-beta-rich cytotoxic amyloid fibrils. Papain-fibrils were found to catalyse cross-seeding of proteins, and enhanced autooxidation of neurotransmitters was observed in the presence of papain-fibrils. Since papain is extensively used in protein-based food processors and therapeutic-formulations, the results provide fundamental insights into structural conversion of papain into amyloid-prone-conformers via a high-low temperature switch, revealing possible food amyloid risks.

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**Title:** Estimating the variations and trends of surface skin temperature across the Indus River Basin

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**Abstract:** The Earth's skin temperature (SKT) can be useful for monitoring the impacts of climate change and anthropogenic activities on the energy exchange of land-atmosphere in the world's mountains and adjacent plains. Thus, this study aims to analyze the distribution and trends of SKT in the Indus River Basin (IRB) using reanalysis and remote sensing data from 1981 to 2021 by applying the Theil Sen slope estimator and Mann-Kendall significance test. It explores how SKT interacts with various factors, including air temperature (at 2 m), total cloud cover, land use/land cover, normalized difference vegetation index (NDVI), and snow cover area, using Pearson correlation and multiple linear regression. The findings show a significantly rising trend in the annual mean SKT of the basin (0.32 degrees C/decade). The highest SKT warming is found in post-monsoon

(0.53 degrees C/decade), followed by pre-monsoon (0.51 degrees C/decade), winter (0.44 degrees C/decade), and monsoon (0.38 degrees C/decade). Among the sub-basins of the IRB, Kabul (0.39 degrees C/decade) is experiencing the highest warming trend, followed by Upper Indus (0.35 degrees C/decade), Panjnad (0.29 degrees C/decade), and Lower Indus (0.27 degrees C/decade). The study also found enhanced warming in the basin at elevations between 1500 and 4500 m asl. The warming trends in the study area with local variations may be ascribed to the rising air temperature, total cloud cover, NDVI, and decreasing snow cover area. The rising SKT may seriously affect the basin's energy balance and ecosystem. The present study would help to improve the understanding of the SKT dynamics in land and water resource planning of the study region.

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**Abstract:** The single-phase ceramic sample (1-x)Ba(Ti0.8Zr0.2)O-3-x(Ba0.7Ca0.3)TiO3 (x = 0.4 and 0.6) was prepared using a solid-state reaction method. The prepared sample shows mixed phase of the tetragonal and rhombohedral crystal structure from XRD. The phase transition from tetragonal to rhombohedral is caused by the red shifting of the vibration B-1/E(TO3)/E(LO2) mode at low temperatures Raman study. Further, the permittivity and electrical conductivity values show the presence of a three-phase transition between Rhombohedral-orthorhombic around similar to 50 degrees C orthorhombic-tetragonal at around similar to 250 degrees C and tetragonal-cubic at about similar to 350 degrees C. The dielectrcic value epsilon(r) = 600 for x = 0.6 and high epsilon(r) = 980 for x = 0.4 at 500 degrees C at low-frequency region and obtained co-exsistence of phases for x = 0.4. The PL spectra showed indications of rhombohedral structure in the sample. So this material could be applicable for the microelectronic devices.

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**Abstract:** PurposeThe regulatory landscape in rare diseases and oncology has evolved to address unmet medical needs by implementing expedited approval pathways. The US FDA's Accelerated Approval and the EMA's Conditional Marketing Authorization facilitate earlier patient access to therapies through reliance on surrogate endpoints derived from early-phase clinical trials. The review aims to provide a comprehensive review of the role and utilization of surrogate endpoints in accelerated drug approvals, highlighting their strengths, limitations, and the varying perspectives of stakeholders on their validity and utility.MethodsThis article reviews existing literature and regulatory guidelines to assess the effectiveness and challenges associated with surrogate endpoints in expedited approval pathways. It also examines the post-approval commitment adherence required by regulatory bodies, exploring discrepancies among stakeholder perspectives.ResultsFindings indicate that while surrogate endpoints enable faster market access, uncertainties remain regarding post-approval commitments and their consistency. Differences in stakeholder opinions also persist, reflecting varying levels of confidence in the validity and applicability of surrogate endpoints.ConclusionSurrogate endpoints play a crucial role in accelerating drug approvals in areas with high

unmet needs, yet challenges around post-approval commitments and stakeholder acceptance suggest the need for enhanced regulatory clarity and ongoing assessment of surrogate endpoint validity.

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**Abstract:** This article reports on the synthesis of single crystalline gray-Arsenic (As) via the Bismuth flux method. The x-ray Diffraction (XRD) pattern revealed the single phase of the as-grown crystal, which crystallized in the rhombohedral structure with the space group R-3m. The sharp XRD peaks observed on mechanically exfoliated thin flakes of the same ensured high crystallinity of the same with growth direction along the c-axis. The Energy Dispersive x-ray Analysis (EDAX) endorses the stoichiometric purity of the as-grown As single crystal. The Raman spectra are recorded to study the vibrational mode, which showed peaks at 196.2 cm-1 and 255.74 cm-1, identified as Eg and A1g modes respectively, by DFT calculations. The as-grown crystal is further characterized for its electronic and magneto-transport properties. The resistivity versus temperature (rho-T) measurements illustrated its metallic nature throughout, right from 300 K down to 2 K. The measured residual resistivity ratio (rho 300K/rho 2K) of the sample is 180, which endorses the high metallic nature of the as-synthesized As single crystal. The transverse magnetic field-dependent resistivity (rho-H) measurements elucidated huge (104%) magneto-resistance (MR) at 2 K and 14Tesla transverse magnetic fields, along with the SdH oscillations, indicating the presence of topological surface states. The non-trivial band topology and edge states in As are confirmed by first principle calculations. Not only do orbital projected bands show the signature of band inversion but also the Z2 invariant value (1,111) calculated by Wilson's loop method affirms As to be a strong topological insulator (TI). Clear evidence of topological edge states in plane kz = 0 has been observed in surface state spectra and slab bands.

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**Abstract:** The global society widely utilises pesticides to enhance agricultural productivity. These pesticides adversely affect the environment by leaching into groundwater and contaminating it. To tackle this issue, we have synthesized the Ag/Ag2O/CuO nanocomposite (NC) using a one pot hydrothermal process at a low temperature as a potential material for the removal of isoproturon from wastewater. Comprehensive characterization of the NC was performed using various analytical techniques. The PXRD analysis confirms the synthesis of Ag/Ag2O/CuO NC. XPS validates a peak at 367.5 eV of Ag (O), which was deconvoluted by a Gaussian profile, giving 16.75% and 11.64% concentration of Ag and Ag+ ions, respectively. DRS analysis observed a significant shift in the band gap from 1.51 to 1.65 eV in the NC. This blue shift is attributed to the Moss-Burstein effect, due to the addition of high concentration of silver. The photodegradation of isoproturon has been performed under light irradiation using Ag/Ag2O/CuO NC, which exhibits photocatalytic degradation efficiency of 98%, higher than pure CuO NPs and Ag2O NPs. The improved photocatalytic performance of the NC can be attributed to the existence of oxygen vacancies, as confirmed by the XPS investigation and EPR spectrum. The photocatalyst was also explored for its effectiveness in regeneration and repurposing of isoproturon. The antibacterial activity against both gram-negative (E. coli) and gram-positive (Streptomyces toxytricini) strains is observed and results in effective inhibition of the growth of bacteria using the produced NC.

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**Abstract:** Pure WS2 and composite WS2/MoS2 thin films deposited by the CBD method have been studied for photodetector applications with different wavelengths. XRD results show a polycrystalline rhombohedral phase with crystallite size of similar to 41 nm and similar to 27 nm, for pure and composite thin films, respectively. The optical absorption spectra of pure WS2 and composite WS2/MoS2 thin films show absorption in the region from 320 nm to 720 nm, making these thin films a workable photodetector in the visible range. The band gap was observed to be similar to 2.18 eV, 2.86 eV for WS2 while 1.97 eV, 2.83 eV, 3.32 eV for WS2/MoS2. I-V characteristics were measured across the heterojunction to determine the transport properties. Low saturation current of the order of 10(-8) A, low sub-second response and recovery time for monochromatic light sources of red, green and blue were obtained. The linear dynamic range was 3.00-11.94 which makes these thin films, by

comparing the figure of merit value the WS2/MoS2 nanocomposite heterostructure thin film over p-Si shows prominent results for application as broad-range photodetectors in the visible region.
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**Abstract:** Background Cancer is one of the major health problems worldwide and medicinal plants constitute a common alternative for cancer treatment having no or fewer side effects. This study aimed to assess total phenolic (TPC) and flavonoid (TFC) contents, antioxidant, biological activities (especially antibacterial, antifungal, and anticancer), and chemical composition of methanol extract of M. napaulensis DC. bark (MNBM). This is the first study evaluating its anticancer activity and chemical composition by LC-MS/MS analysis. Methods TPC, TFC, antioxidant, antimicrobial, and anticancer activities were determined by Folin-Ciocalteu, AlCl3, DPPH, Resazurin, and MTT assays, respectively. Its metabolite profiling was done by LC-MS/MS analysis. The statistical significance of differences between test groups was analyzed by a one-way

ANOVA. Results The preliminary phytochemical screening revealed the presence of various phytochemicals viz. alkaloids, steroids, glycosides, polyphenols, tannins, flavonoids, coumarins, terpenoids, and quinone. MNBM showed 38.00 +/- 1.50 mg GAE g(-1) dry sample as TPC, 35.04 +/- 4.87 mg QE g(-1) dry sample as TFC, and 212.97 mu g/mL IC50 value (P < 0.05) as moderate antioxidant activity. MNBM showed minimal inhibitory concentration (MIC) values of 100.22 mg/mL, 50.15 mg/mL, and 25.08 mg/mL against S. aureus, E. coli, and C. albicans, respectively as weak antimicrobial activity. It showed no antibacterial effect against B. cereus and P. aeruginosa at 120 mg/mL. The anticancer activity of MNBM was moderate against human lung cancer cells A549 (228.97 mu g/mL IC50 value) and human cervical cancer cells HeLa (367.72 <mu>g/mL IC50 value) (P < 0.05). The LC-MS/MS analysis reported the presence of different anticancer compounds viz. dihydroberberine, d-berbamine, (S)-glaucine, protopine, grosheimin, mycophenolic acid, berberine, alpha-linolenic acid, etc. Conclusions MNBM showed dose-dependent moderate antioxidant, weak antibacterial, weak antifungal, and moderate anticancer activity due to the synergistic effect of different phytochemicals and anticancer compounds.

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**Abstract:** To enhance therapeutic efficacy and achieve controlled drug release for colon cancer therapeutics, this study focuses on developing a hydrocolloid-based, pH-responsive biocompatible nanocarrier. We synthesized sphingomyelin (SM)-loaded zein nanoparticles (SM-LNPs) stabilized using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC), leveraging the aromatic interactions of zein to optimize drug encapsulation and release kinetics. In silico molecular docking and molecular dynamics (MD) simulations demonstrated strong intermolecular interactions between zein, SM, and EDC, supporting the formulation's rational design. Comprehensive physicochemical characterization confirmed the stability and structural integrity of SM-LNPs. Dynamic light scattering (DLS) and field emission scanning electron microscopy (FE-SEM) analyses revealed a monodispersed, spherical morphology with an optimized particle size suitable for oral drug delivery. In vitro drug release studies indicated a sustained and pH-responsive release profile, with 90.60 % of SM released at pH 6.8, mimicking intestinal conditions. Cell viability assays using HCT 116 colon cancer cells showed that SM-LNPs exhibited significantly enhanced cytotoxicity (41.44 % reduction in cell viability) compared to free SM, confirming their potential for cancer therapeutics. Additionally, pharmacokinetic simulations validated the controlled release and systemic retention of SM, supporting its suitability for oral administration. Our findings demonstrate that SMLNPs offer a promising drug delivery platform with enhanced stability, pH response release, and improved bioactivity, paving the way for their potential application in colon cancer treatment. This research provides critical insights into nanocarrier design, drug delivery kinetics, and biomaterial-based therapeutic strategies for precision oncology.

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**Abstract:** Neuraminidase (NA) is an essential enzyme located at the outer layer of the influenza virus and plays a key role in the release of virions from infected cells. The rising incidence of global epidemics has made the urgent need for effective antiviral medications an urgent public health priority. Furthermore, the emergence of resistance caused by specific mutations in the influenza viral genome exacerbates the challenges of antiviral therapy. In view of this, this study aims to identify and analyse possible inhibitors of NA from different subtypes of influenza viruses. Initially, a thorough search was conducted in the Protein Data Bank (PDB) to gather structures of NA proteins that were attached with oseltamivir, a widely recognized inhibitor of NA. Here, 36 PDB entries were found with NA-oseltamivir complexes which were studied to evaluate the diversity and mutations present in various subtypes. Finally, N1(H1N1) protein was selected that demonstrated low IC50 value of oseltamivir with mutation H275Y. In addition, the study utilized BiMODAL generative model to generate 1000 novel molecules with comparable structures to oseltamivir. A QSAR model, based on machine learning (ML), was built utilizing the ChEMBL database to improve the selection process of candidate inhibitors. These inhibitors were subsequently analysed by molecular docking and further the best hits compounds (compound_375, compound_106 and compound_597) were appended to make a bigger molecule (compound_106-375, compound_106-597, and compound_375-597) to fit into the binding pocket of protein. Further, triplicate molecular dynamics simulations lasting 100 ns to assess their effectiveness and binding stability showed that compound_106-375 had the most stable binding with the protein. Key residues, including Asn146, Ala138, and Tyr155, form critical interactions with the ligand, contributing to its stability. The investigation was enhanced by employing principal component analysis (PCA), free energy landscape (FEL), and binding free energy calculations. The total binding free energy (GTOTAL) of - 169.62 kcal/mol suggests that the contact between compound_106-375 and the mutant N1 (H1N1) protein is thermodynamically favourable. This approach allowed for a thorough comprehension of the binding interactions and possible effectiveness of the discovered inhibitors. Overall, these findings demonstrate that compound_106-375 exhibits favourable binding characteristics and stability. Further experimental validation is required to confirm its efficacy against the H275Y mutant neuraminidase protein and its potential to overcome influenza drug resistance. However, compound_106-375 is suggested as a promising candidate for further development as a therapeutic agent against the mutant N1 (H1N1) protein. This finding will assist in drug development and to overcome the challenges associated with drug resistance in influenza strains.

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**Abstract:** A complex interplay of environmental factors profoundly influences plant cellular metabolism, with gaseous exchange serving as a fundamental physiological process critical to growth and survival. While wellcharacterized in natural environments, the role of gaseous exchange in plant in-vitro culture remains underexplored. Plant in-vitro culture offers a versatile platform for studying metabolism, where metabolic networks are highly flexible and sensitive to environmental factors. Despite advancements in understanding these dynamics, there has been relatively little investigation into how gaseous exchange within tissue culture systems affects cellular metabolism. In the present study, we investigated the effects of gaseous exchange on plant growth and metabolism by comparing traditional Parafilm- and micropore-tape-based cultures designed to facilitate different levels of gaseous exchange. A comprehensive metabolomics approach using liquid chromatography-highresolution mass spectrometry and gas chromatography-mass spectrometry was employed to delineate the metabolic changes in Arabidopsis under Parafilm- and micropore-tape-sealed culture conditions at two and three weeks of growth. Metabolic profiling identified increased levels of oxidized glutathione, arginine, ornithine, and aspartic acid, and decreased levels of TCA cycle intermediates and phenylpropanoid metabolites, indicating that restricted gas exchange alters the redox status and reprograms primary and secondary metabolism. This reprogramming affected amino acid metabolism, arginine metabolism, energy metabolism, as well as phenylpropanoid and flavonoid biosynthetic pathways. Restricted gaseous exchange in Parafilm-wrapped cultures also led to altered accumulation of several essential macro- and microelements in Arabidopsis seedlings. The present study demonstrated that restricted gaseous exchange inhibits plant growth and disrupts metabolism.

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**Abstract:** Scarcity of empirical studies turning the concepts into cost-effective practices is a barrier in achieving the desired trajectory and scale of ecosystem restoration. The present study aimed to assess (i)

potential of tree-bamboo-medicinal herb mixed plantation founded on the concept of adaptive co-management in restoration of degraded community forest in a temperate village of Indian Himalaya and (ii) persistence of offer of local people to voluntarily maintain and expand the trial after its economic benefit/cost ratio became >1.0. Biodiversity, carbon stock and economic benefits were assessed in the restored forest 1, 3 and 10 years after 7-year-long-funding phase (i.e., 8, 10 and 20 years after initial planting in 1991), and other land uses in the village landscape. Significant economic loss occurred from gregarious flowering induced mass mortality of bamboo in the 2nd year after funding phase but it was outweighed by the gain from walnut fruiting. People maintained recovery by transplanting Nepalese Alder (Alnus nepalensis) in gaps. The 20-year-old restored forest land had 17% of aboveground and 75% of belowground carbon stocks, and 39% of flowering species present in the intact forest. Restored forest had only four of the eight Near-threatened/Threatened species present in intact forest. Further, intact forest was monetarily the most efficient land use despite absence of payments for its ecosystem services. People did not expand the trial or medicinal plant cultivation in farms induced by it. They abandoned cropping in 39% farm area and leased 24% abandoned area to a company. Flowering plant species richness and carbon stocks changed at the ecosystem scale but not at the village landscape scale. Emission from agricultural abandonment nullified carbon sequestration by forest restoration. Community forest restoration should render both material/monetary and non-material/non-monetary benefits to people. Cultural landscapes should be taken as spatial units for ecosystem restoration planning, monitoring and evaluation.

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**Title:** Assessing the role of regional characteristics in estimating the volume of glacial lakes in the upper Indus-Ganga-Brahmaputra basins, Hindu Kush Himalaya

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**Abstract:** Glacial lakes have exponentially increased in the recent decades across the world's mountains, particularly in the Hindu Kush Himalaya (HKH), caused by rapid melting of glaciers. Consequently, their water volume and hence the hazard potential had also increased in recent decades. Robust water volumes of hazardous glacial lakes located in remote locations are rarely available, limiting the accuracy of current glacial lake outburst flood (GLOF) models that heavily rely on empirical water volume estimation equations. The majority of presently used equations are mainly based on data collected in the European Alps and have limited applicability in the HKH region. Thus, accurately predicting GLOF extents and likely damages in the downstream regions remains a critical challenge in the HKH region. In this study, we developed eight empirical equations to estimate mean depth (4) and volume (4) of glacial lakes in the upper Indus-Ganga-Brahmaputra (IGB) river basins. The study is based on a field-based bathymetric dataset of 25 glacial lakes from different parts of the upper IGB river basins. Separate equations were formulated for the major basins to understand the influence of regional lake characteristics on depth and volume estimations of glacial lakes. Our analysis revealed a non-linear negative relationship between the circularity ratio of glacial lakes and their mean depth, indicating that elongated lakes tend to be deeper than the circular ones. The average circularity ratio of glacial lakes in the upper IGB basins was 0.51 (as of 2020). We estimated the mean depth and total volume for a dataset comprising 19,284 glacial lakes in the upper IGB basins. The estimated mean depth and total estimated volume of these lakes in 2020 was 7.20 m and 28.88 km3, respectively. The empirical equations generated in the study based on the field-based bathymetry will be helpful in assessing the GLOF threats from continuously expanding glacial lakes in the upper IGB basins.

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**Abstract:** Two Gram-stain-negative bacterial strains (MEB164T and MEB148), were isolated from haloalkaline waters of Lonar, crater lake, India. The strains were helical, non-spore-forming and motile with polar tufts of flagella. Optimal growth occurred at 37 degrees C, at pH 10 and with 3% (w/v) NaCl. 16S rRNA gene sequences of strains (MEB164T and MEB148) demonstrated the highest similarity with Marinospirillum alkaliphilum DSM 21637T (97.8%) followed by Marinospirillum celere DSM 18438T (96%). The genome size of strain MEB164T was determined to be 2.8 Mb with genomic DNA G + C contents of 53.1 mol %. ANI and dDDH values between strain MEB164T and the most closely related type strain M. alkaliphilum DSM 21637T were (72.3% and 21.4 +/- 2.3%) while (AAI and POCP) values were (66.8 and 70.8%), respectively. Strain MEB164T exhibited potential for polyhydroxybutyrate (PHB) production, supported by key genes involved in PHB metabolism. Genome analysis further revealed presence of various pH tolerance genes, highlighting its adaptation to Lonar Lake. The predominant cellular fatty acids were summed feature 8 (C18:1 omega 7c/C18:1 omega 6c), C16:0 and summed feature 3 (C16:1 omega 7c/C16:1 omega 6c). The major respiratory quinone was ubiquinone-8. The prevalent polar lipids were diaminophosphatidylglycerol, phosphatidylglycerol, phosphatidylethanolamine, two unidentified amino phospholipids, three unidentified phospholipids and one unidentified lipid. Polyphasic analysis suggests that the two strains constitute a novel species within the genus Marinospirillum (family Oceanospirillaceae), proposed as Marinospirillum alkalitolerans sp. nov. The type strain is MEB164T (= JCM 35957T = MCC 5207T = NCIMB 15458T) and MEB148 (= JCM 35956 = MCC 5212 = NCIMB 15459) is an additional strain.

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**Abstract:** The electrostatic low energy beam transport (ELEBT) is used to handle low energy and intense beams from ion sources. It is preferred over magnetostatic low energy beam transport (MLEBT) for many reasons such as compactness, no space charge compensation and no transverse phase space coupling, more beam current handling capacity and less emittance growth as well as beam losses. The MLEBT has served in Linear accelerator 4 (LINAC4) at CERN and has been in operation at the test stand for about a decade but with demands of increasing luminosity and source upgradation to provide more beam current, there is a need of compact LEBT design which may overcome the limitations of MLEBT. The paper describes the novel design of an ELEBT by means of numerical simulation with many advantages over previous configurations and is designed to deliver the 70 mA H- beams at 45 keV energy within targeted rms normalized emittances of 0.5 pi mm-mrad. We adopt the most reliable method for multiparticle beam dynamics simulation by first extracting 3D electric field data of optimized ELEBT generated by FEM computational tool and then running multiparticles with the appropriate grid. The numerical studies show the 100% beam transmission in the proposed ELEBT. It has lower output beam emittances compared to measured beam emittances from existing MLEBT. With more numerical optimization, the energy spread and transverse twiss parameters at the end of the ELEBT are maintained within the existing RFQ acceptance. The beam optical, electrical and hardware specifications of the ELEBT section are presented in detail along with thermal analysis.

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**Record 26 of 30**

**Title:** Design and Implementation of High Isolation Textile MIMO Antenna for Wearable Applications

**Author(s):** Kumar, S (Kumar, Sanjeev); Srivastava, K (Srivastava, Kunal); Kumar, S (Kumar, Sachin); Sharma, D (Sharma, Deepti); Tiwari, RN (Tiwari, Rakesh N.); Kandwal, A (Kandwal, Abhishek); Singh, MK (Singh, Mahesh Kumar); Goyal, B (Goyal, Bhawna)

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**Abstract:** This work presents a single-layer wideband textile multiple-input-multiple-output (MIMO) antenna for wearable devices. The antenna design is made up of two rectangular-shaped monopole antennas that are mirror imaged and connected to achieve an equal voltage level in the ground surface. The antenna elements are excited by 50-Omega microstrip feed lines. By using a triangular stub decoupling element on the ground plane, greater than 22 dB of isolation is attained among antenna elements. The suggested two-element MIMO antenna has a bandwidth of 2.3-8.0 GHz and a dimension of 30 mm x 58 mm x 1 mm. In addition, four- and eight-element MIMO geometries have been designed and analyzed for massive MIMO applications. Also, an eight-element MIMO belt antenna for wearable straps is investigated. The effects of antenna bending on the human body are also investigated.

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**Title:** Reframing the agrarian question(s): pluralism, politics and the promise of critical agrarian studies : Handbook of critical agrarian studies

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**Record 28 of 30**

**Title:** Robust strain-mediated ferromagnetism of 2D-Mn<sub>2</sub>O<sub>3</sub>: A DFT study

**Author(s):** Kumar, P (Kumar, Pankaj); Singla, R (Singla, Renu); Singla, R (Singla, Rahul); Kumar, S (Kumar, Sarvesh); Saini, HS (Saini, Hardev S.); Kashyap, MK (Kashyap, Manish K.)

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**Abstract:** A comprehensive structural analysis of novel 2D-Mn2O3 under biaxial strain has been performed through density functional theory (DFT) approach. It is found as an indirect band gap magnetic semiconductor with a total spin magnetic moment of 16 mu B per unit cell. The impact of tensile and compressive strains on the magnetic state and band gap of 2D-Mn2O3 has also been investigated. Our findings indicate that the band gap of 2D-Mn(2)O(3 )is highly influenced by both strains whereas its ground state remains unaffected. All these desired properties render 2D-Mn2O3 as a promising candidate for spintronics and memory-based devices.

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Bharti R, 2022, TUBERCULOSIS, V134, DOI 10.1016/j.tube.2022.102198
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**Abstract:** Inhaled therapy of tuberculosis (TB) by a Dry Powder Inhalation (DPI) comprising mycobacteriophage D29 and TM4 was non-inferior to oral anti-tuberculosis therapy (ATT) with isoniazid and rifampicin in a mouse model of infection with Mycobacterium tuberculosis (Mtb). No pharmaceutical phage product of mycobacteriophages is approved for large-scale production. We scaled up preparation and downstream processing of phages, developed DPI formulations, and established methods for determining identity, purity, assay, stability, and critical quality attributes (CQA). We carried out cell-based assays of intracellular bactericidal activity and pharmacokinetics and comparative efficacy in Mtb-infected mice. Daily doses of the DPI containing similar to 10(10) Plaque Forming Units/dose DPI reduced Mtb colony forming units (CFU) in the lungs from 6.4 +/- 0.3-log to 4.8 +/- 0.7-log in four weeks, while oral human equivalent doses (HED) of isoniazid and rifampicin reduced CFU to 3.8 +/- 0.8-log. Combining inhaled phages with oral drugs sterilized the lungs of one of four mice and reduced group mean CFU to 2.3-log. Inhalations significantly upregulated tumor necrosis factor (TNF) in lung tissue to similar to 1500 pg/ml of homogenate, improved organ morphology, and reduced histopathology. The HD DPI may be a useful adjunct to oral drugs. Dose-finding animal efficacy studies are required before assessing preclinical safety.

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**Abstract:** Mental health and well-being are greatly influenced by interactions between gut microbiota and the brain. This "gut microbiome-brain axis" (GMBA) operates through the various metabolic products released by gut microbes, which can be altered by diet changes. Additional research is needed to elucidate the association among diet, microbial constitution, metabolite production, and various neurological and neurodegenerative conditions. This article abridges the current understanding of microbiota-mediated mental pathogenesis, opportunities for non-invasive diagnosis, and treatment options utilizing GMBA modulations. Research on the interactions between diet, microbiota, and the brain has revealed that nutritional therapy could be a promising approach for preventing or treating depression, anxiety, and neurodegenerative diseases. Studies show that the gut microbiota regulates neurological pathways, endocrine signaling, tryptophan metabolism, gut-brain communication, and immune responses. The consumption of dietary components like prebiotics, probiotics, and pharmaceutical products can modify the gut microbiota, influencing mental health and well-being. Moreover, both psychiatric and non-psychiatric neurodegenerative disorders, as well as bacterial infections, play a critical role in maintaining gut microbiota and affecting mental health. As a result, there is potential to develop innovative functional foods, supplements, or medicines tailored to support a gut microbiome that promotes better mental health.

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