SCHOLARLY PUBLICATIONS
School of Biotechnology
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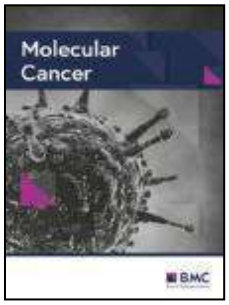
Journal Name: Molecular Cancer **IF: 33.9**

Title: Epithelial-to-mesenchymal transition (EMT) and cancer metastasis: the status quo of methods and experimental models 2025

Author: Allgayer H.; Mahapatra S.; Mishra B.; Swain B.; Saha S.; Khanra S.; Kumari K.; Panda V.K.; Malhotra D.; Patil N.S.; Leupold J.H.; Kundu G.C.

Details: Volume 24, Issue 1, December 2025, Article number 167

Abstract: Epithelial-to-mesenchymal transition (EMT) is a crucial cellular process for embryogenesis, wound healing, and cancer progression. It involves a shift in cell interactions, leading to the detachment of epithelial cells and activation of gene programs promoting a mesenchymal state. EMT plays a significant role in cancer metastasis triggering tumor initiation and stemness, and activates metastatic cascades resulting in resistance to therapy. Moreover, reversal of EMT contributes to the formation of metastatic lesions. Metastasis still needs to be better understood functionally in its major but complex steps of migration, invasion, intravasation, dissemination, which contributes to the establishment of minimal residual disease (MRD), extravasation, and successful seeding and growth of metastatic lesions at microenvironmentally heterogeneous sites. Therefore, the current review article intends to present, and discuss comprehensively, the status quo of experimental models able to investigate EMT and metastasis in vitro and in vivo, for researchers planning to enter the field. We emphasize various methods to understand EMT function and the major steps of metastasis, including diverse migration, invasion and matrix degradation assays, microfluidics, 3D co-culture models, spheroids, organoids, or latest spatial and imaging methods to analyze complex compartments. In vivo models such as the chorionallantoic membrane (CAM) assay, cell line-derived and patient-derived xenografts, syngeneic, genetically modified, and humanized mice, are presented as a promising arsenal of tools to analyze intravasation, site specific metastasis, and treatment response.



URL: https://molecular-cancer.biomedcentral.com/articles/10.1186/s12943-025-02338-2

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: Journal of Hazardous Materials **IF: 11.3**

Title: Inactivation of Vaccinia Virus via Nitric Oxide-Plasma Activated Water: A Potential Way to Inactivate Mpox Virus

Author: Patel, P.; Acharya, T.R.; Lenka, S.S.; Ghosh, S.; Mukherjee, S.; Lamichhane, P.; Jaiswal, A.; Verma, S.K.; Kaushik, N.; Choi, E.H.; Kaushik, N.K.

Details: Volume 499 Issue 5 November 2025

Abstract: Mpox virus (*Poxviridae* family) an emerging environmental bio-contaminant caused a non-zoonotic human infection in 2022. The recent surge mirrors early COVID-19 trends, highlighting the need for effective viral inactivation to prevent outbreaks and reduce environmental risks. Our study explores an eco-friendly and non-toxic antiviral approach using nitric oxide (NO_x)-plasma activated water (PAW) for environmental decontamination. Vaccinia virus (VACV) chosen as a surrogate model due to their genetic similarities with Mpox virus (MPXV). Results demonstrated that NO_x-PAW was non-toxic to host cells and significantly reduced VACV infection in lung c ell cultures. Moreover, it induced structural alterations in viral attachment proteins A27 and H3, compromising their functionality resulting in reduced binding affinity towards heparan sulfate and lowering internalization via macropinocytosis. Sequence analysis between VACV and MPXV, including receptor-binding domains, confirmed high similarity, supporting VACV's utility as a model for MPXV inactivation studies. Furthermore, *in-silico* analysis revealed NO_x species (NO, NO_2, NO_3 and N_2O) played crucial role in modification of surface protein by interaction with the amino acids. Overall, the study demonstrated successful VACV inactivation highlighting NO_x-PAW as a promising environmentally safe antiviral strategy for mitigating the spread of DNA viruses like MPXV in contaminated settings, contributing to proactive outbreak prevention and environmental biosafety.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0304389425028808

SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: Food Bioscience **IF: 5.9**

Title: Synergistic control of Pseudomonas aeruginosa biofilms using Limosilactobacillus fermentum and preservation factors

Author: De, S.; Nayak, P.P.; Nayak, A.; Garnaik, S.; Kumar, S.; Das, S.; Paramasivan, S.S.; Sasikumar, R.; Panda, S.K.

Details: Volume 74, December, 2025

Abstract: Biofilms formed by Pseudomonas aeruginosa on food substrates and in processing environments are robust and difficult to penetrate or degrade, posing a significant challenge to current control strategies. The objective of the study was to develop and validate a safe strategy for controlling P. aeruginosa biofilm in the food industry. Limosilactobacillus fermentum GGS, isolated in our laboratory, exhibited excellent antimicrobial and antibiofilm activity against P. aeruginosa, a common foodborne opportunistic pathogen capable of forming biofilms. To ensure maximum control over the P. aeruginosa biofilm, the study considered the use of cell-free supernatant (CFS) from L. fermentum, in combination with common preservation factors, namely acetic acid (for lowering the pH), and salt (NaCl). Response surface methodology (RSM) employing Box-Behnken design (BBD) was used to optimize the control of biofilm formation with the three process variables (CFS, pH, and NaCl). Synergistic interactions among CFS (20.48 %), pH (5.29), and NaCl (3.23 %) were predicted to result in 88.71 % biofilm inhibition, according to the RSM model, a finding later confirmed in an in situ study. A quadratic model (R^2 = 0.975) was developed to predict the nonlinear interactions between the inhibitory agents and biofilm inhibition. This model was further validated using machine learning techniques. Among the models evaluated, Artificial Neural Network (ANN) (R^2 = 0.998) and Random Forest (RF) (R^2 = 0.989) showed strong agreement with the RSM predictions. Atomic force microscopy (AFM) analysis further revealed a reduction in mean roughness (Sa) and root mean square roughness (Sq), along with increased skewness, following treatment with the optimal combination of CFS, low pH, and NaCl.

URL: https://www.sciencedirect.com/science/article/abs/pii/S2212429225019741?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: Biomass and Bioenergy **IF: 5.8**

Title: Fermentation of sugarcane bagasse for production of value-added phenolic compounds using potential bacterial strains: A comparative analysis

Author: Pattnaik B.; Preeti; Gupta D.; Deb D.; Selvaraj M.; Assiri M.A.; Mohapatra S.R.; Sahoo H.P.; Tapas S.; Sarangi P.K.

Details: Volume 202, November 2025

Abstract: The present study investigates the potential of bacterial strains, viz., Pseudomonas fragi, Lactobacillus plantarum, and Lactobacillus acidophilus, for the production of phenolic compounds from sugarcane bagasse (SCB). The important bio-transformed phenolic products isolated from the medium were ferulic acid (FA), vanillin and vanillic acid (VA), whose identification and quantification were done by high-performance thin-layer chromatography. Carbohydrate concentration from the de-starched bagasse was also assessed and compared with that of the original (control) bagasse. Results revealed that the utmost FA yield per kg of SCB was 275 mg from Lactobacillus acidophilus, 225 mg from Pseudomonas fragi on the 9th day, and 212 mg from Lactobacillus plantarum on the 12th day of incubation. Likewise, the peak vanillin and VA quantified per ml of fermented extract were 16 mg on 9th and 12th day of incubation, respectively, for Lactobacillus plantarum, 14 mg of vanillin and 13 mg of VA on 9th day for Pseudomonas fragi. However, in Lactobacillus acidophilus 15 mg of Vanillin and 18 mg of VA was recorded on 12th day of incubation. To compare enzymatic efficiency and structural integrity among ferulic acid esterases (FAEs), a 3D structural model was constructed. We first time demonstrated that the lid domain's structural integrity enhances enzyme efficiency which has been expressed in terms of yield. An ∼18 % higher yield of primary phenolic compound was obtained for L. acidophilus with compact FAE lid domain compared to PsfFAE. This finding highlights the metabolic potential of these strains for phenolics production and their relevance in biotransformation processes.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0961953425005720?via%3Dihub

SCHOLARLY PUBLICATIONS
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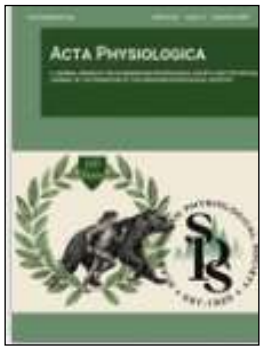
Journal Name: Acta Physiologica **IF: 5.6**

Title: Is Predisposition to T2D Impacted by Polymorphisms in Genes Involved in Insulin Signaling and Cellular Bioenergetics?

Author: Pati, B.; Jastroch, M.; Bal, N.C.

Details: Volume 241, Issue 12, December, 2025

Abstract: Background: Type 2 diabetes (T2D) represents a growing global health challenge, with its prevalence and associated metabolic complications rising sharply over the past two decades. Although the pathogenesis of T2D is complex and influenced by lifestyle and (micro)environmental factors, genetic constituents have been considered major predisposing factors. Recent literature shows significant individual variations in both the progression of T2D and the efficacy of antidiabetic drugs. These individual variations are expected to emanate from the inherent genetic make-up and potential epigenetic modifications by environmental factors. Hypothesis: It has been proposed that altered metabolism (including cellular bioenergetic mechanisms) provides protection from T2D. Moreover, several researchers have proposed that proteins regulating cellular bioenergetics, for example, involved in adaptive thermogenesis, represent good targets to counter T2D. Therefore, we thoroughly searched the literature on genetic variability associated with T2D in this review. Results: We could only find genes involved in (1) insulin secretion (INS, PDX1, ABCC8, KCNJ11, KCNQ1, CDKAL1, IGFBP2) and (2) cellular bioenergetics in insulin-responsive tissues (INSR, IRS, AKT, SLC2A4, TBC1D4, PPP1R3A, LEP, LEPR, ADIPOQ, TCF7L2, PPAR-γ, SLC30A8). Specific attention is given to diverse ethnic populations, in particular Indian subgroups where these genetic factors may display clearer association to T2D. Conclusion: By emphasizing genetic predispositions, this review highlights the lack of studies on the genetic association of cellular bioenergetics proteins in T2D pathogenesis. It also underscores the potential for early detection, personalized management, and the development of targeted therapies for individuals with T2D across different genetic profiles.



URL: https://onlinelibrary.wiley.com/doi/10.1111/apha.70122

SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: Nutrients **IF: 5.0**

Title: Dietary Influences on Nitrogen and Phosphorus Footprints in Indian Food Systems: A State and Union Territory-Level Analysis

Author: Dhar, A.R.; Oita, A.; Kaushik, H.; Panda, A.N.; Adhya, T.K.; Matsubae, K.

Details: Volume 17, Issue 23, November 2025

Abstract: Background/Objectives: Nitrogen (N) and phosphorus (P) are essential macronutrients for crop production. However, their losses throughout the agri-food system pose significant environmental and public health risks. India, with its diverse dietary cultures and large agricultural sector, presents a unique context for evaluating nutrient footprints. This study aims to provide the first sub-national assessment of food-related N and P footprints across Indian states and union territories, evaluating how vegetarian and non-vegetarian diets influence these footprints. Methods: This study employed a diet-sensitive bottom-up approach using national dietary consumption statistics from 2011–2012 to estimate food N and P footprints. The analysis incorporated regional dietary profiles and nutrient use efficiencies in crop production, along with food waste data, to quantify the affecting factors. Results: The national average food footprints were estimated at 13.11 kg-N capita^{-1} year^{-1} and 1.16 kg-P capita^{-1} year^{-1}, with sub-national variation ranging from 52% to 144% of the national average for N, and 46% to 166% for P. Regions with prevalent non-vegetarian diets exhibited significantly higher footprints than those with vegetarian diets. Low nutrient use efficiencies (NUE 19%, PUE 31%) and consumer-level food waste (contributing nearly 4%) were also identified as key drivers of elevated footprints. Conclusions: The findings indicate that dietary choices, agricultural nutrient management, and food waste practices collectively contribute to the nutrient-related risks in India. Enhancing nutrient use efficiency, promoting plant-based diets, and improving waste management in culturally and regionally sensitive ways are crucial for reducing N and P losses. These findings provide actionable insights for the development of sustainable nutrition and agro-environmental policies.

URL: https://www.mdpi.com/2072-6643/17/23/3758

SCHOLARLY PUBLICATIONS
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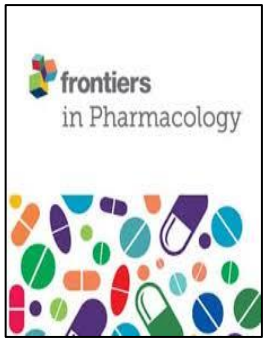
Journal Name: Frontiers in Pharmacology **IF: 4.8**

Title: Bioassay-guided isolation of sesamin and fargesin from the hydroalcoholic stem extract of Zanthoxylum armatum DC. inhibited inflammation in CpG-stimulated conventional type 1 dendritic cells

Author: Singh, N.I.; Mukherjee, C.; Soibam, J.; Singh, W.M.; Bal, N.C.; Raghav, S.K.; Singh, C.B.

Details: Volume 16, November 2025

Abstract: Zanthoxylum armatum DC. is renowned for its medicinal values. All the plant parts have been used to treat tooth- and gum-related problems, gastro-intestinal problems, inflammation, rheumatism, and pain by the indigenous people of Nepal, India, China, and other South East Asian countries. Bioassay-guided isolation of active compounds from medicinal plants is recognized as a promising approach for the discovery of novel drug candidates. The objective of this study was to examine the main constituents of Zanthoxylum armatum DC. stems through bio-guided isolation and to explore their anti-inflammatory potential. Method: Sequential fractions were prepared from the hydromethanolic stem extract of Z. armatum DC. Afterward, bioassay-guided isolation was conducted using a combination of column chromatography, heat-induced hemolysis inhibition assay, and albumin denaturation inhibition assay. The structures of the isolated compounds were elucidated through single crystal XRD and NMR. The anti-inflammatory activity of the compounds was evaluated in vitro by measuring the expression levels of IL12 and CD80 using flow cytometry. Results: Sequential ethyl acetate fraction showed the highest protein anti-denaturation and membrane stabilization activities. Afterward, sesamin and fargesin were isolated from the sequential ethyl acetate fraction. Both of them showed activity against IL12 production by conventional type 1 dendritic cells. Moreover, fargesin significantly inhibited the expression of CD80. Conclusion: The results identified bioactive compounds with potential against the pro-inflammatory dendritic cells for the first time. The findings justified the traditional use of Z. armatum DC. as an anti-inflammatory agent.



URL: https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2025.1687789/full

SCHOLARLY PUBLICATIONS
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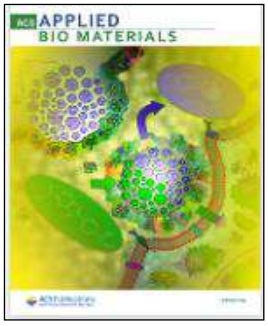
Journal Name: **ACS Bio Applied Materials** **IF: 4.7**

Title: Adhesive and Wound Healing, Dual Active Hydrogel with Snail Mucus Proteins

Author: Das, O; Newar, J; Verma, S; Swalsingh, G; Das, A; Reddy, KS; Bal, NC; Ghatak, A

Details: November, 2025

Abstract: Many gastropods secrete mucus, which is more viscous and adhesive than the common trail mucus. The primary biochemical distinction between the two types of mucus is the higher protein content of the adhesive mucus. Not enough is known about the function of each of these proteins. In the current study, two of such mucus proteins were isolated from the adhesive mucus of the land snail *Macrochlamys indica*. In an attempt to imitate the structure of the mucus, these proteins were mixed with commercial hyaluronic acid (HA). The resultant hydrogel was found to have adhesive properties. A cell viability assay revealed that each of the hydrogel components and their mixtures were biologically safe and compatible. The *in vitro* cell migration assay showed better wound closure in case of the mucus protein as compared to HA, which is already known for its wound healing properties. The hydrogel was used for incision wound healing in mice, followed by histological staining. The result showed faster healing when compared to that of commercial wound healing ointment. In conclusion, this study presents a wound repair material, formulated from snail protein and HA and useful as an adhesive wound dressing with healing effects.



URL: https://pubs.acs.org/doi/10.1021/acsabm.5c01923

SCHOLARLY PUBLICATIONS
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Journal Name: Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy **IF:4.6**

Title: Spectroscopic investigation of hydrogen bond network stability and microplastic leaching in ethanol-based potentised medicines at extreme dilutions during prolonged plastic storage

Author: Chakraborty S.; Ghosh K.; Biswas S.; Roy Chaudhuri C.; Roy Chowdhury A.; Chakravarty R.; Nayak D.; Kaushik S.; Barui A.; Kundu S.

Details: Vol. 343, Dec 2025

Abstract: The quality and efficacy of pharmaceutical products stored under proper conditions are critical. This study examined the effects of long-term plastic storage on extremely diluted ethanol-based potentised (EP) medicines using advanced spectroscopic techniques. Four medicines, Arnica montana, Rhus toxicodendron, Conium maculatum, and Belladonna, at ultra-high (200C, 1 M) and moderate-high (30C, 200C) potencies, were stored in glass and plastic containers for one month. Glass-stored medicines showed increased antioxidant activity and zeta potential with higher potency, while plastic-stored samples showed a decreasing trend. Conductivity was inversely correlated with zeta potential, with glass-stored medicines showing a ~ 41.91 % reduction, while plastic-stored samples showed a ~ 36.29 % increase. Mid-IR spectra revealed a blue shift (~4–14 cm^{-1}) in O–H stretching and a red shift (~2–3 cm^{-1}) in H–O–H bending for glass-stored medicines, showing weaker inter-molecular H-bonds at higher potencies. In contrast, plastic-stored medicines showed opposite shifts (~2–17 cm^{-1}), implying more constrained H-bonding due to carbonyl-water interaction in presence of microplastics, disrupting the native ethanol-water H-Bond network. Far-IR spectra showed an enthalpic gain (~45.34 %) in glass-stored medicines, while plastic-stored samples showed an enthalpic loss (~56.60 %), confirming structural destabilisation of native water-network due to microplastic leaching. Our findings show that plastic containers compromised the efficacy of studied medicines by altering H-bond network stability and electrical properties. Further studies on different plastic grades and storage durations are needed to validate these findings and explore cost-effective alternatives for long-term storage of such medicines.

URL: https://www.sciencedirect.com/science/article/abs/pii/S1386142525009229?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

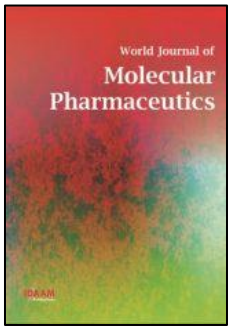
Journal Name: Molecular Pharmaceutics **IF: 4.5**

Title: Harnessing Nanotechnology to Rewire Lipid Metabolism: A Novel Therapeutic Avenue for Brain Cancer

Author: Dash, SR; Hembram, KC; Chateerjee, S; Das, C; Das, B

Details: November 2025

Abstract: The uncontrolled proliferation of abnormal brain cells characterizes brain cancer. It is lethal and develops resistance upon treatment with commonly available modalities, such as chemotherapy and radiotherapy. Findings showed that the altered metabolic programming in brain cancer is one of the major hallmarks that support the energy expenditures of the malignant cells. As evidenced, brain tumors showed elevated de novo lipid synthesis to support membrane biosynthesis, activation of oncogenic signaling, and energy storage. The most common enzymes required for lipid biosynthesis include fatty acid synthase (FASN), acetyl-CoA carboxylase (ACC), and sterol regulatory element-binding proteins (SREBPs), which are found to be upregulated during brain cancer progression. Importantly, altered lipid metabolism not only fuels tumor growth but also modulates the tumor microenvironment (TME), restricting the infiltration of immune cells, inactivating the immune cells, and ultimately promoting the development of therapeutic resistance. Therefore, unraveling how lipid biosynthesis fuels brain cancer progression is of greater importance than ever so that it could unlock new avenues for developing precise and effective targeted therapies. In the past few years, the use of nanotechnology-based delivery systems has shown promising results in selective targeting of lipid metabolic pathways while minimizing secondary toxicities, paving the way for more effective and personalized treatment approaches. This review explains how lipid biosynthesis drives brain cancer progression and the potential of a nanotechnology-based approach to modulate the abnormal lipid metabolism in brain cancer.



URL: https://pubs.acs.org/doi/10.1021/acs.molpharmaceut.5c01091

SCHOLARLY PUBLICATIONS
School of Biotechnology
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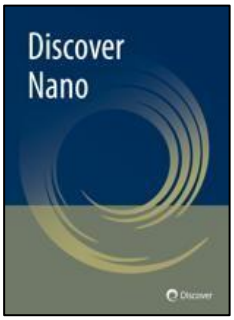
Journal Name: Discover Nano **IF: 4.5**

Title: Prospects and challenges of nanomaterials in sustainable food preservation and packaging: a review (vol 19, 178, 2024)

Author: Pattnaik, R; Panda, SK; Biswas, S; De, SYT; Satahrada, S; Kumar, S

Details: Volume 20, Issue 1, December 2025

Abstract: Nanomaterials play a pivotal role in food preservation and its safety, offering ingenious solutions for sustainable food packaging. Nanomaterials enable the creation of packaging materials having unique functional properties. It not only extends the shelf life of the foods by releasing preservatives but also enhances food safety by preventing microbial contamination or food spoilage. In this review, we aim to provide an overview of the various applications of nanotechnology in food packaging, highlighting its key advantages. We also delve into the safety considerations and regulatory issues involved in developing nanotechnology-based food packaging materials. Additionally, advancements in the field of nanotechnology-based packaging have the potential to create safer, more sustainable, and high-quality packaging with greater functionality that delivers essential benefits to manufacturers and consumers.



URL: https://link.springer.com/article/10.1186/s11671-024-04174-7

SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: Plant Science **IF: 4.1**

Title: Unearthing the secrets of drought-driven root system architecture: Nutrient acquisition and rhizosphere microbe interplay

Author: Nayak, J.; Chattopadhyay, D.; Giri, M.K.; Singh, N.

Details: Volume 363, February 2026

Abstract: Drought, a climatic occurrence that cyclically affects all climatic regions, is more prevalent in tropical and subtropical areas. This phenomenon inflicts physiological harm upon plants within ecosystems and agroecosystems. Apart from the direct scarcity of water, which severely impairs plant development and productivity, there can be consequential issues related to mineral nutrition. These secondary effects can arise and further impact plant development. Amidst drought conditions, roots play a critical role in shaping the growth and development of plants. During these circumstances, our understanding of the molecular mechanisms governing critical responses and interactions between plant roots and their surrounding rhizosphere is less comprehensive in comparison to other studies with well-characterized model species like Arabidopsis. This article examines the molecular mechanisms governing the adaptability of root system architecture (RSA) to drought stress in plants. It also explores how soil nutrients and microorganisms are regulated in response to these adaptive processes. We first give a general description of how plant hormones control RSA under water-scarce conditions. Additionally, we explore how nutrients, particularly phosphorus and nitrogen, affect the developmental responses of RSA to low water status. Additionally, this article delves into the existing understanding of the interactions between RSA and soil microbial niches under drought. Based on these understandings, our conclusion emphasizes that to achieve a more comprehensive grasp of the mechanisms underlying drought adaptation in plant roots, future research should adopt a holistic network perspective.

URL: https://www.sciencedirect.com/science/article/abs/pii/S016894522500473X?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: Scientific Reports **IF: 3.9**

Title: Novel endophytic actinomycetes species Streptomyces panacea of Panax sokpayensis produce antimicrobial compounds against multidrug resistant Staphylococcus aureus

Author: Rai S.; Singh L.S.; Liriina K.; Jeyaram K.; Parija T.; Sahoo D.

Details: Volume 15, Issue 1, December 2025, Article number 19863

Abstract: Endophytic actinomycetes of medicinal plants have recently been in focus for developing novel antimicrobial compounds to combat multidrug-resistant pathogens. In this study, we isolated and characterised endophytic actinomycetes of Panax sokpayensis rhizome traditionally used as medicine in Sikkim-Himalayan region and assessed their antimicrobial activity against multidrug-resistant (MDR) clinical isolates of Staphylococcus aureus. Saccharopolyspora dominated as the endophytic actinomycetes of P. sokpayensis rhizome. However, a novel actinomycete strain PSRA5^T belongs to the genus Streptomyces, with the highest genome sequence similarity of 91.54% with its closest relative Streptomyces niveus NCIMB 11891 has shown an effective inhibition of six clinical isolates of MDR S. aureus during disc diffusion assay. Further comparative analysis of cellular fatty acids composition and phenotypic and biochemical characteristics of strain PSRA5^T with its phylogenetically closely related strain of S. niveus, classified as representing a novel species of the genus Streptomyces, for which the name Streptomyces panacea sp. nov. is proposed here with type strain PSRA5^T (= MCC5238^T). The minimum inhibition concentration of ethyl acetate crude extract of PSRA5^T culture supernatant against MDR S. aureus isolates was 5.5 to 13.5 µg/mL. Further correlation between biosynthetic gene clusters identified by genome search with LC-MS analysis-based chemical profiling of PSRA5^T culture extract and antibacterial activity of the representative compounds detected several compounds of aminoglycosides and polyketides with antimicrobial activity against MDR S. aureus isolates.

URL: https://www.nature.com/articles/s41598-025-05333-1

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

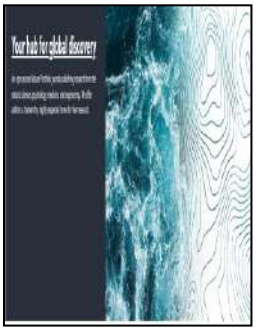
Journal Name: Scientific Reports **IF: 3.9**

Title: Association of intermediate monocytes with dengue severity among the pediatric population of Odisha, India

Author: Dash, M.K.; Samal, S.; Rout, S.; Bhola, R.K.; Gartia, J.; Saha, I.; Behera, C.K.; Hamdi, H.; Sahu, M.C.; Das, B.

Details: Volume 15, Issue 1, December, 2025

Abstract: Dengue virus (DENV) infection in children exhibits varied clinical presentations, wherein the role of monocytes is important in the innate immune response. In this study, laboratory-confirmed DENV pediatric patients (n = 120), with DENV-2 infection, were categorized into dengue fever (DF), dengue with warning signs (DWS) and severe dengue (SD) were assessed for monocyte subpopulation analysis using immunophenotyping involving CD14 and CD16 host-surface markers. Molecular docking was performed using HADDOCK 2.4 to analyze the interactions between CD14, CD16 and DENV envelope and capsid proteins. Among the cases, 84 (70%) were classified as DF and 36 (30%) as DWS & SD. Hematological and biochemical parameters indicated that thrombocytopenia and elevated hematocrit (> 40%) were significantly more common in DWS & SD, with markedly elevated liver enzymes (ALT and AST) in severe cases. Classical monocytes (CM-CD14++ CD16−) constituted 72.51% and 66.25% of the monocyte population in DF and DWS & SD cases, respectively. Intermediate monocytes (IM-CD14+ CD16+) comprised 9.89% and 30.86% in DF and DWS & SD cases, respectively. Non-classical monocytes (NCM-CD14+ CD16++) comprised 5.75% and 8.12% in DWS & SD and DF cases, respectively. In silico analysis revealed host CD16 and CD14 exhibited potential interactions with DENV capsid and envelope proteins, with binding energies − 8.9, − 10.1, − 8.6, and − 11.1 kcal/mol, respectively. IM was significantly increased in DWS & SD compared to DF ($p < 0.05$). These findings suggest that IM could act as host markers of DENV severity in children.



URL: https://www.nature.com/articles/s41598-025-21089-0

SCHOLARLY PUBLICATIONS
School of Biotechnology
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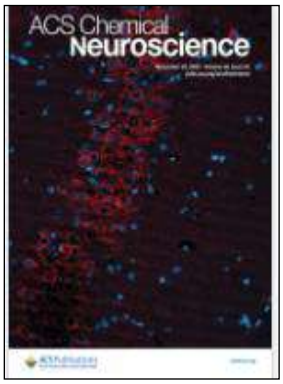
Journal Name: ACS Chemical Neuroscience **IF: 3.9**

Title: Identifying Novel Spiro-Indenoquinoxaline-Pyrrolidine-Based Amyloid Beta Inhibitors in Alzheimer's Disease from In Silico to In Vitro

Author: Rani, S.; Kaur, M.; Pothal, P.; Rajput, K.; Khera, A.; Sharma, A.; Thombare, V.; Sethi, A.; Paul, B.; Gartia, J.; Yadav, V.K.; Patil, N.A.; Ranawat, P.; Suresh Babu, A.R.; Singh, G.; Barnwal, R.P.

Details: Volume 16, Issue 22, November, 2025

Abstract: Alzheimer's disease (AD) is the most prevalent neurodegenerative disease characterized by memory loss and other cognitive functions. The key hallmarks of AD include extracellular beta-amyloid clumps and intracellular neurofibrillary tau tangles in the neurons. Cholinesterase inhibitors and NMDA-receptor antagonists and their combination are already approved treatments; however, these only give short-term symptom relief. Therefore, new therapeutic techniques and novel drugs are required to combat the century-old AD. This study includes the screening of nine novel small compounds (spiro-indenoquinoxaline-pyrrolidines) via in silico approaches; these compounds have been scrutinized to explore their potential as antiamyloidogenic drugs. Computational tools, including ADMET analysis, molecular docking, and molecular dynamics (MD) simulations, have been used for screening the selected compounds against monomeric peptides of Aβ ($A\beta_{1-40}$and $A\beta_{1-42}$) and their oligomeric counterparts, i.e., $6A\beta_{9-40}$and $6A\beta_{1-42}$. Among the nine molecules screened for this study, ADPR-d reflected the best drug-likeness and negligible toxicity. Further, ADPR-d has the highest binding affinity for all the peptides selected for this study. Additionally, MD simulations of Aβ peptide–ADPR-d complexes confirmed a stable complex formation. In vitro aggregation assay and cell culture studies for $A\beta_{1-42}$also support our in silico findings. The positive findings of the presented study highlight that the ADPR-d molecule may prove to be a potential therapeutic molecule against AD. However, these results would require further in vitro and in vivo analysis before proceeding to clinical settings with these compounds against AD.



URL: https://pubs.acs.org/doi/10.1021/acschemneuro.5c00728

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: Journal of Material Cycles and Waste Management **IF: 3.0**

Title: Harnessing the untapped value of food waste: A review of integrated valorization technologies

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Details: November 2025

Abstract: The continuous growth of the global population has led to a market rise in food waste (FW) generation, posing serious environmental and economic challenges. Improper and inadequate FW management negatively impact soil, water, and air quality, contributing to environmental degradation, and hampering economic progress. The conventional methods of managing FW, such incineration and landfilling, remain widely practiced, however, these practices often result in the release of harmful by-products, such as greenhouse gas emissions which undermine environmental sustainability. While current standalone conversion technologies, including gasification, pyrolysis, anaerobic digestion, hydrothermal carbonization, composting, and fermentation, have shown potential for energy recovery and resource valorization, they often lack integration and scalability. Nevertheless, these technologies still face limitations, such as incomplete waste conversion, low process efficiency, and the generation of toxic intermediates or inhibitors. To address these limitations, integrated valorization approaches should be adopted to enable the production of high-energy-yielding products, including solid biofuels (hydrochar), liquid biofuels (biodiesel), biogas (methane), and hydrogen-rich syngas. The successful implementation of advanced and sustainable food waste valorization strategies can play a pivotal role in realizing a circular bioeconomy and mitigating the global food waste crisis. Achieving this requires interdisciplinary collaboration among researchers, stakeholders, and policymakers to ensure strong alignment with the sustainable development goals.

URL: https://link.springer.com/article/10.1007/s10163-025-02423-0