SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: **Molecular Cancer** **IF: 27.7**

Title: Modulation of the tumor microenvironment and mechanism of immunotherapy-based drug resistance in breast cancer

Author: Kundu M., Butti R., Panda V.K., Malhotra D., Das S., Mitra T., Kapse P., Gosavi S.W., Kundu G.C.

Details: Volume 23, Issue 1, December 2024

Abstract: Breast cancer, the most frequent female malignancy, is often curable when detected at an early stage. The treatment of metastatic breast cancer is more challenging and may be unresponsive to conventional therapy. Immunotherapy is crucial for treating metastatic breast cancer, but its resistance is a major limitation. The tumor microenvironment (TME) is vital in modulating the immunotherapy response. Various tumor micro-environmental components, such as cancer-associated fibroblasts (CAFs), tumor-associated macrophages (TAMs), and myeloid-derived suppressor cells (MDSCs), are involved in TME modulation to cause immunotherapy resistance. This review highlights the role of stromal cells in modulating the breast tumor microenvironment, including the involvement of CAF-TAM interaction, alteration of tumor metabolism leading to immunotherapy failure, and other latest strategies, including high throughput genomic screening, single-cell and spatial omics techniques for identifying tumor immune genes regulating immunotherapy response. This review emphasizes the therapeutic approach to overcome breast cancer immune resistance through CAF reprogramming, modulation of TAM polarization, tumor metabolism, and genomic alterations.

URL: https://molecular-cancer.biomedcentral.com/articles/10.1186/s12943-024-01990-4

SCHOLARLY PUBLICATIONS
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Journal Name: **Chemical Engineering Journal** **IF: 13.3**

Title: Intensifying inactivation strategies: Insights into the role of ultrasound on the inactivation of antibiotic resistant Acinetobacter baumannii via Photo-Fenton reaction

Author: Pranjal; Mahapatra, GC; Chakrabortty, S; Banerjee, S; Chowdhury, S; Khan, MA; Kumar, R; Jeon, BH; Mishra, A; Lundborg, CS; Tripathy, SK

Details: Volume 497, October 2024

Abstract: Improvisation of the contemporary water treatment technologies is critical not only to prevent water borne diseases but also to augment the available water sources. Here, a systematic study is effectuated to comprehend the upswing in the inactivation efficiency of Photo-Fenton (PF) chemistry induced by ultrasound (US) against antibiotic resistant (ABR) Acinetobacter baumannii (A. baumannii). Inactivation of A. baumannii (≈5×106 CFU/mL) was noticed within 75 and 105 min of US assisted PF (SPF) and PF processes respectively using 20 mg/L of H2O2 and 2 mg/L of Fe2+. It was interesting to notice that the PF reaction was effective under weak acidic condition (pH=3 and 5.5) whereas SPF process was realized over a wide pH range (3, 5.5, 7 and 9). No reactivation of the bacteria was found in both the processes till 96 h suggesting the impairment of not only the bacterial cell membrane but also the intracellular components. Experimental results although has suggested the generation of several reactive oxygen species (ROS), the inactivation mechanism was suggested to be dominated by the H2O2 and •OH. The damage caused to the bacterial cell membranes by the synergistic role of US and ROS was observed in the electron microscopy images. Comparative transcriptomic analysis has indicated the upregulation of genes regulating the LPS assembly proteins (Lpt A, B, C) and Pls B, Pgs A and Pal genes regulating the phospholipid synthesis which are known to regulate the stress induced response in bacteria. The SPF process was further validated with real water samples and the treated water was not found to have remarkable toxic effect on the in-vivo animal which endorse its candidature for future applications.

URL: https://www.sciencedirect.com/science/article/abs/pii/S1385894724061618?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
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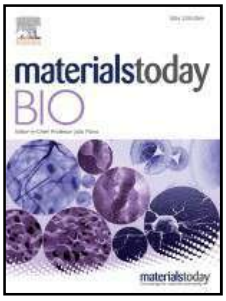
Journal Name: Materials Today Bio **IF: 8.7**

Title: Detrimental consequences of micropolymers associated plasticizers on endocrinal disruption.

Author: Saha, U; Kumari, P; Ghosh, A; Sinha, A; Jena, S; Kirti, A; Gupta, A; Choudhury, A; Simnani, FZ; Nandi, A; Sahoo, RN; Kumari, S; Mishra, R; Kaushik, NK; Singh, D; Suar, M; Verma, SK

Details: Volume 27, August 2024, Article No. 101139.

Abstract: The prevalence of polymer usage in everyday activities has emerged as a detriment to both human life and the environment. A large number of studies describe severe impacts of micropolymers (MP) and nanopolymers (NP) on various organ systems, including the endocrine system. Additionally, plasticizers utilized as additives have been identified as endocrine-disrupting chemicals (EDCs). MP/NP, along with associated plasticizers, affect principal signalling pathways of endocrine glands such as the pituitary, thyroid, adrenal, and gonads, thereby disrupting hormone function and metabolic processes crucial for maintaining homeostasis, fertility, neural development, and fetal growth. This review delves into the sources, distribution, and effects of micropolymers, nanopolymers, and associated plasticizers acting as EDCs. Furthermore, it provides a detailed review of the mechanisms underlying endocrine disruption in relation to different types of MP/NP.



URL: https://www.sciencedirect.com/science/article/pii/S2590006424001984?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

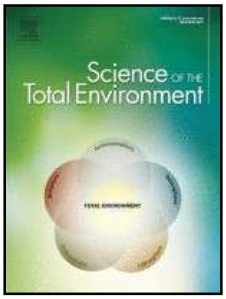
Journal Name: Science of the Total Environment **IF: 8.2**

Title: Controlled in vivo intrinsic detrimental effect of D-Limonene channelized by influential proximal interaction through apoptosis and steatosis in embryonic zebrafish (Danio rerio).

Author: Choudhury A.; Lenka S.S.; Gupta A.; Mandal D.; Sinha A.; Saha U.; Naser S.S.; Singh D.; Simnani F.Z.; Ghosh A.; Kumari S.; Kirti A.; Parija T.; Chauhan R.S.; Kaushik N.K.; Suar M.; Verma S.K.

Details: Volume 949, 1 November 2024, Article No. 175243.

Abstract: Bioaccumulation of d-Limonene in environment due to the aggrandised usage of their natural sources like citrus food wastes and industrial day to day life products has raised concern to their biotoxicity to environment biotic health. Moreover, their after-usage discharge to aquatic system has enhanced the distress of posing threat and needs attention. This study entails mechanistic and molecular evaluation of in-vivo biotoxicity of d-Limonene in zebrafish embryo models. Experimental analysis excavated the controlled concentration-dependent morphological, physiological and cellular in-vivo impact of d-Limonene in zebrafish embryos through significant changes in oxidative stress, steatosis and apoptosis regulated via 6-fold and 5-fold mRNA expression change in p53 and Sod1 genes. Computational evaluation deduced the cellular mechanism of d-limonene biotoxicity as irregularities in oxidative stress, apoptosis and steatosis due of their intrinsic interaction with metabolic proteins like Zhe1a (−4.8 Kcal/mol), Sod1(−5.3 Kcal/mol), p53, caspase3 and apoa1 leading to influential change in structural and functional integrity of the metabolic proteins. The study unravelled the measured in-vivo biotoxicity of d-Limonene at cellular and molecular level to advocate the controlled usage of d-Limonene related natural and industrial product for a sustainable environmental health.



URL: https://www.sciencedirect.com/science/article/abs/pii/S0048969724053932?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

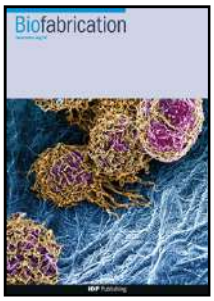
Journal Name: Biofabrication **IF: 8.2**

Title: Biofabricated nanomaterials in sustainable agriculture: insights, challenges and prospects.

Author: Mohanty P.; Singh P.K.; Lenka B.; Adhya T.K.; Verma S.K.; Ayreen Z.; Patro S.; Sarkar B.; Mohapatra R.K.; Mishra S.

Details: Volume 16, Issue 41, October 2024, Article No. 042003.

Abstract: One ever-evolving and ever-demanding critical human endeavour is the provision of food security for the growing world population. This can be done by adopting sustainable agriculture through horizontal (expanding the arable land area) and vertical (intensifying agriculture through sound technological approaches) interventions. Customized formulated nanomaterials have numerous advantages. With their specialized physico-chemical properties, some nanoparticulated materials improve the plant's natural development and stress tolerance and some others are good nanocarriers. Nanocarriers in agriculture often coat chemicals to form composites having utilities with crop productivity enhancement abilities, environmental management (such as ecotoxicity reduction ability) and biomedicines (such as the ability to control and target the release of useful nanoscale drugs). Ag, Fe, Zn, TiO2, ZnO, SiO2 and MgO nanoparticles (NPs), often employed in advanced agriculture, are covered here. Some NPs used for various extended purposes in modern farming practices, including disease diagnostics and seed treatment are also covered. Thus, nanotechnology has revolutionized agrotechnology, which holds promise to transform agricultural (ecosystems as a whole to ensure food security in the future. Considering the available literature, this article further probes the emergent regulatory issues governing the synthesis and use of nanomaterials in the agriculture sector. If applied responsibly, nanomaterials could help improve soil health. This article provides an overview of the nanomaterials used in the distribution of biomolecules, to aid in devising a safer and eco-friendly sustainable agriculture strategy. Through this, agri-systems that depend on advanced farming practices might function more effectively and enhance agri-productivity to meet the food demand of the rising world population.



URL: https://iopscience.iop.org/article/10.1088/1758-5090/ad60f7

SCHOLARLY PUBLICATIONS
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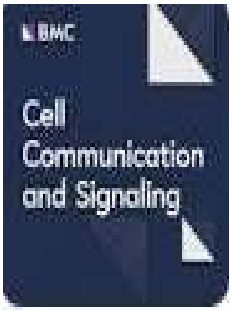
Journal Name: **Cell Communication and Signaling** **IF: 8.2**

Title: The role of Aquaporins in tumorigenesis: implications for therapeutic development

Author: Bhattacharjee A., Jana A., Bhattacharjee S., Mitra S., De S., Alghamdi B.S., Alam M.Z., Mahmoud A.B., Al Shareef Z., Abdel-Rahman W.M., Woon-Khiong C., Alexiou A., Papadakis M., Ashraf G.M.

Details: Volume 22 , Issue 1, December 2024

Abstract: Aquaporins (AQPs) are ubiquitous channel proteins that play a critical role in the homeostasis of the cellular environment by allowing the transit of water, chemicals, and ions. They can be found in many different types of cells and organs, including the lungs, eyes, brain, glands, and blood vessels. By controlling the osmotic water flux in processes like cell growth, energy metabolism, migration, adhesion, and proliferation, AQPs are capable of exerting their regulatory influence over a wide range of cellular processes. Tumour cells of varying sources express AQPs significantly, especially in malignant tumours with a high propensity for metastasis. New insights into the roles of AQPs in cell migration and proliferation reinforce the notion that AQPs are crucial players in tumour biology. AQPs have recently been shown to be a powerful tool in the fight against pathogenic antibodies and metastatic cell migration, despite the fact that the molecular processes of aquaporins in pathology are not entirely established. In this review, we shall discuss the several ways in which AQPs are expressed in the body, the unique roles they play in tumorigenesis, and the novel therapeutic approaches that could be adopted to treat carcinoma.



URL: https://biosignaling.biomedcentral.com/articles/10.1186/s12964-023-01459-9

SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: **Biomedicine and Pharmacotherapy** **IF: 6.9**

Title: Biophysical translational paradigm of polymeric nanoparticle: Embarked advancement to brain tumor therapy

Author: Naser SS, Gupta A, Choudhury A, Yadav A, Sinha A, Kirti A, Singh D, Kujawska M, Kaushik NK, Ghosh A, De S, Verma SK.

Details: Volume 17, 9 October 2024, Article number 117372

Abstract: Polymeric nanoparticles have emerged as promising contenders for addressing the intricate challenges encountered in brain tumor therapy due to their distinctive attributes, including adjustable size, biocompatibility, and controlled drug release kinetics. This review comprehensively delves into the latest developments in synthesizing, characterizing, and applying polymeric nanoparticles explicitly tailored for brain tumor therapy. Various synthesis methodologies, such as emulsion polymerization, nanoprecipitation, and template-assisted fabrication, are scrutinized within the context of brain tumor targeting, elucidating their advantages and limitations concerning traversing the blood-brain barrier. Furthermore, strategies pertaining to surface modification and functionalization are expounded upon to augment the stability, biocompatibility, and targeting prowess of polymeric nanoparticles amidst the intricate milieu of the brain microenvironment. Characterization techniques encompassing dynamic light scattering, transmission electron microscopy, and spectroscopic methods are scrutinized to evaluate the physicochemical attributes of polymeric nanoparticles engineered for brain tumor therapy. Moreover, a comprehensive exploration of the manifold applications of polymeric nanoparticles encompassing drug delivery, gene therapy, imaging, and combination therapies for brain tumours is undertaken. Special emphasis is placed on the encapsulation of diverse therapeutics within polymeric nanoparticles, thereby shielding them from degradation and enabling precise targeting within the brain. Additionally, recent advancements in stimuli-responsive and multifunctional polymeric nanoparticles are probed for their potential in personalized medicine and theranostics tailored for brain tumours.

URL: https://www.sciencedirect.com/science/article/pii/S0753332224012575?via%3Dihub

Journal Name: **Biomedicine and Pharmacotherapy** **IF: 6.9**

Title: Corrigendum to "Cellular landscaping of cisplatin resistance in cervical cancer" Biomed. Pharmacother. 153(2022) 113345

Author: Bhattacharjee R, Dey T, Kumar L, Kar S, Sarkar R, Ghorai M, Malik S, Jha NK, Vellingiri B, Kesari KK, Perez de la Lastra JM, Dey A.

Details: Volume 177, August 2024, Article number 117097

Abstract: The authors regret that incorrect information was given in the citation list of the publication The incorrect references and their corrections are as follows: Reference 27 should be same as reference 245 Reference 75 should be same as reference 82 Reference 274 should be same as reference 276 Reference 53 should be: Li, Q., Peng, X., Yang, H., Rodriguez, J. A., & Shu, Y. (2012). Contribution of organic cation transporter 3 to cisplatin cytotoxicity in human cervical cancer cells. Journal of pharmaceutical sciences, 101(1), 394–404. Reference 61 Should be: Waalkes, M. P., Liu, J., Kasprzak, K. S., & Diwan, B. A. (2006). Hypersusceptibility to cisplatin carcinogenicity in metallothionein-I/II double knockout mice: Production of hepatocellular carcinoma at clinically relevant doses. International journal of cancer, 119(1), 28–32. https://doi.org/10.1002/ijc.21245 References 69, and 73 should be: Wang, N., Hou, M. S., Zhan, Y., Shen, X. B., & Xue, H. Y. (2018). MALAT1 promotes cisplatin resistance in cervical cancer by activating the PI3K/AKT pathway. European Review for Medical & Pharmacological Sciences, 22(22). Reference 96 should be: Chen SH, Chang JY. New Insights into Mechanisms of Cisplatin Resistance: From Tumor Cell to Microenvironment. Int J Mol Sci. 2019 Aug 24;20(17):4136. doi: 10.3390/ijms20174136 Reference 229 should be: O'Brien, J., Hayder, H., Zayed, Y., & Peng, C. (2018). Overview of microRNA biogenesis, mechanisms of actions, and circulation. Frontiers in endocrinology, 9, 402. Reference 247 should be: Schräder, M., Nayeri, S., Kahlen, J. P., Müller, K. M., & Carlberg, C. (1995). Natural vitamin D3 response elements formed by inverted palindromes: polarity-directed ligand sensitivity of vitamin D3 receptor-retinoid X receptor heterodimer-mediated transactivation. Molecular and cellular biology, 15(3), 1154–1161. References 4, 156, 180, 199, 270, 273, are unnecessary and can be deleted The authors would like to apologise for any inconvenience caused.

URL: https://www.sciencedirect.com/science/article/pii/S0753332224009818?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

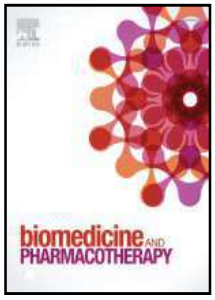
Journal Name: Biomedicine and Pharmacotherapy **IF: 6.9**

Title: The interplay between cytokines, inflammation, and antioxidants: mechanistic insights and therapeutic potentials of various antioxidants and anti-cytokine compounds.

Author: Bhol, NK; Bhanjadeo, MM; Singh, AK; Dash, UC; Ojha, RR; Majhi, S; Duttaroy, AK; Jena, AB

Details: Volume 178, September 2024, Article No. 117177.

Abstract: Cytokines regulate immune responses essential for maintaining immune homeostasis, as deregulated cytokine signaling can lead to detrimental outcomes, including inflammatory disorders. The antioxidants emerge as promising therapeutic agents because they mitigate oxidative stress and modulate inflammatory pathways. Antioxidants can potentially ameliorate inflammation-related disorders by counteracting excessive cytokine-mediated inflammatory responses. A comprehensive understanding of cytokine-mediated inflammatory pathways and the interplay with antioxidants is paramount for developing natural therapeutic agents targeting inflammation-related disorders and helping to improve clinical outcomes and enhance the quality of life for patients. Among these antioxidants, curcumin, vitamin C, vitamin D, propolis, allicin, and cinnamaldehyde have garnered attention for their anti-inflammatory properties and potential therapeutic benefits. This review highlights the interrelationship between cytokines-mediated disorders in various diseases and therapeutic approaches involving antioxidants.



URL: https://www.sciencedirect.com/science/article/pii/S0753332224010618?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: **Advanced Materials Technologies** **IF: 6.4**

Title: Rationalizing Defective Biomimetic Ceria: In Vitro Demonstration of a Potential â€œTrojan Horseâ€ Nanozyme Based-Platform Leveraging Photo-Redox Activities for Minimally Invasive Therapy

Author: Sarkar S.; Malhotra D.; Debnath M.; Kundu G.C.; Srivastava R.; Kulkarni A.R.

Details: September 2024

Abstract: Semiconductor nanostructures with surface defect-mediated chemistry have garnered pronounced interest due to their exceptional photo-induced intracellular bio-catalytic (enzyme-mimicking) responses. However, designing defective nanozymes with pH-responsive multi-bio-catalytic functions without any dopants is challenging. Herein, oxygen-deficient “trojan horse-like” folate-functionalized, L-arginine-coated ceria (FA-L-arg-CeO_2) nanozymes with synergistic multi-enzyme-mimicking and anti-cancer potential are introduced. Intrinsic surface oxygen vacancies ($V_O^{\bullet}$) are strategically created in the nanozymes under kinetically favorable synthesis conditions. Increased surface $V_O^{\bullet}$ promotes band structure reconstruction and amplified photochemica l-response efficacy under single laser irradiation (808 nm), outperforming the defect-free commercial nano-CeO_2 in rapid anti-tumorigenic activities. Through folate receptor-mediated endocytosis, these biostable nanozymes localized in MDA-MB-231 cells (84% in 48 h) and demonstrated NIR-accelerated enzymatic functions depending on the pH of the biological milieu. The reduced band gap energy facilitated effective electron-hole separation, up-regulating in vitro photo-redox reactions that impart exceptional therapeutic potential and inhibit 62% cell metastasis within only 12 h. By perturbing intratumoural redox homeostasis, $V_O^{\bullet}$-rich FA-L-arg-CeO_2 nanozymes unanimously killed 86% of MDA-MB-231 cancer cells while preferentially shielding benign L929 cells. Transcending beyond conventional drug-loaded or dopant-incorporated-CeO_2 nanoplatforms, these defective multi-modal nanozymes unravel a new avenue for developing smart, low-cost, bio-active agents with enhanced efficacy and bio-safety.

URL: https://onlinelibrary.wiley.com/doi/10.1002/admt.202400556

SCHOLARLY PUBLICATIONS
School of Biotechnology
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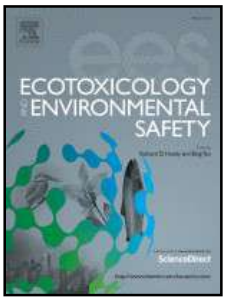
Journal Name: Ecotoxicology and Environmental Safety **IF: 6.2**

Title: Crofton weed derived isomers of ageraphorone as potent antifeedant against Plutella xylostella (L.).

Author: Mayanglambam, S; Siva, B; Katragadda, SB; Labala, RK; Singh, KD; Rajashekar, Y

Details: Volume 282, 1 September 2024, 116729.

Abstract: Global agricultural production is significantly hampered by insect pests, and the demand for natural pragmatic pesticides with environmental concern remains unfulfilled. Ageratina adenophora (Spreng.) also known as Crofton weed, is an invasive perennial herbaceous plant that is known to possess multiple bioactive compounds. In our study, two isomers of ageraphorone metabolites i.e, 10Hα-9-oxo-ageraphorone (10HA) and 10Hβ-9-oxo-ageraphorone (10HB), were identified from Crofton weed, exhibiting potent antifeedant and larvicidal activities against Plutella xylostella. For antifeedant activity, the median effective concentration (EC50) values for 10HA and 10HB in the choice method were 2279mg/L and 3233mg/L, respectively, and for the no choice method, EC50 values were 1721mg/L and 2394mg/L, respectively. For larvicidal activity, lethal concentration (LC50) values for 10HA and 10HB were 2421mg/L and 4109mg/L at 48h and 2101mg/L and 3550mg/L at 72h. Furthermore, both in- vivo and in-vitro studies revealed that the isomers 10HA and 10HB exhibited potent detoxifying enzymes inhibition activity such as carboxylesterase and glutathione S-transferases. Molecular docking and MD simulation analysis provide insight into the possible interaction between isomers of ageraphorone metabolites and Carboxylic Ester Hydrolase protein (Gene: pxCCE016b) of P. xylostella, which led to a finding that CarEH protein plays a significant role in the detoxification of the two compounds in P. xylostella. Finally, our findings show that the primary enzymes undergoing inhibition by isomers of ageraphorone metabolites, causing toxicity in insects, are Carboxylesterase and glutathione S-transferase.



URL: https://www.sciencedirect.com/science/article/pii/S0147651324008054?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
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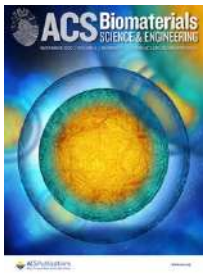
Journal Name: **ACS Biomaterials Science and Engineering** **IF: 5.4**

Title: Surface Engineered Osteoblast-Extracellular Vesicles Serve as an Efficient Carrier for Drug and Small RNA to Actively Target Osteosarcoma

Author: Samal S.; Panda G.P.; Shyamal S.; Das K.; Dash M.

Details: August 2024

Abstract: Osteosarcoma (OS) is a rare malignant tumor that affects soft tissue and has high rates of lung metastasis and mortality. The primary treatments for OS include preoperative chemotherapy, surgical resection of the lesion, and postoperative chemotherapy. However, OS chemotherapy presents critical challenges related to treatment toxicity and multiple drug resistance. To address these challenges, nanotechnology has developed nanosystems that release drugs directly to OS cells, reducing the drug's toxicity. Extracellular vesicles (EVs) are nanosized lipid-bilayer bound vesicles that act as cell-derived vehicles and drug delivery systems for several cancers. This study aims to utilize EVs for OS management by co-delivering Hdac1 siRNA and zoledronic acid (zol). The EVs' surface is modified with folic acid (FA) and their targeting ability is compared to that of native EVs. The results showed that the EVs' targeting ability depends on the parent cell source, and FA conjugation further enhanced it. Furthermore, EVs were used as the carrier for co-loading drug (zol) and small RNA (Hdac-1). This approach of using surface engineered EVs as carriers for cargo loading and delivery can be a promising strategy for osteosarcoma management.



URL: https://pubs.acs.org/doi/10.1021/acsbiomaterials.4c00952

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: **Life Sciences** **IF: 5.2**

Title: ALDH and cancer stem cells: Pathways, challenges, and future directions in targeted therapy

Author: Lavudi K, Nuguri SM, Pandey P, Kokkanti RR, Wang QE.

Details: Volume 356, 1 November 2024, Article Number 123033

Abstract: Human ALDH comprise 19 subfamilies in which ALDH1A1, ALDH1A3, ALDH3A1, ALDH5A1, ALDH7A1, and ALDH18A1 are implicated in CSC. Studies have shown that ALDH can also be involved in drug resistance and standard chemotherapy regimens are ineffective in treating patients at the stage of disease recurrence. Existing chemotherapeutic drugs eliminate the bulk of tumors but are usually not effective against CSC which express ALDH+ population. Henceforth, targeting ALDH is convincing to treat the patient's post-relapse. Combination therapies that interlink signaling mechanisms seem promising to increase the overall disease-free survival rate. Therefore, targeting ALDH through ALDH inhibitors along with immunotherapies may create a novel platform for translational research. This review aims to fill in the gap between ALDH1 family members in relation to its cell signaling mechanisms, highlighting their potential as molecular targets to sensitize recurrent tumors and bring forward the future development concerning the current progress and draw backs. This review summarizes the role of cancer stem cells and their upregulation by maintaining the tumor microenvironment in which ALDH is specifically highlighted. It discusses the regulation of ALDH family proteins and the crosstalk between ALDH and CSC in relation to cancer metabolism. Furthermore, it establishes the correlation between ALDH involved signaling mechanisms and their specific targeted inhibitors, as well as their functional modularity, bioavailability, and mechanistic role in various cancers.

URL: https://www.sciencedirect.com/science/article/pii/S0024320524006234?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: Food Bioscience **IF: 4.8**

Title: Analysis of nutritional value, antiviral potential and in vivo toxicological evaluation of Termitomyces clypeatus R. Hiem mycelial extract, a wild edible mushroom.

Author: Khumlianlal J.; Rajkumari J.; Keshry S.S.; Jena S.; Chattopadhyay S.; Mukherjee P.K.; Sarangthem I.

Details: Volume 61, October 2024, Article No. 104817.

Abstract: The wild edible mushroom, Termitomyces has been employed in traditional medicine by various indigenous communities throughout Asia and Africa. In India, the Santal tribe used it to treat pox while the Mokokchung people used it for abdominal discomfort, cough and whooping cough. However, to date, the antiviral activity of Termitomyces has not been evaluated. Thus, the nutritional value, chemical composition and antiviral potential of Termitomyces clypeatus were investigated. Further, the in vivo oral toxicity of the mushroom extract was assessed in BALB/c mice. The proximate composition analysis indicated a high protein, crude fibre, carbohydrate and mineral content. Bioactive metabolites including Sphinganine, Burseran and Melleolide were also detected in the mushroom extract. For the first time, the anti-antiviral property of Termitomyces clypeatus (100µg/mL) with 95.74% ± 4.01% and 87.13% ± 3.61% inhibition in viral copy number of CHIKV and SARS-CoV-2, respectively was documented. The in vivo acute and sub-acute toxicity study using BALB/c mice revealed no clinical signs of toxicity on oral administration of the mushroom extract. These findings offer the scientific rationale for the possible safe use of Termitomyces clypeatus as a functional food in managing RNA viruses, CHIKV and SARS-CoV-2.

URL: https://www.sciencedirect.com/science/article/abs/pii/S2212429224012471?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Biotechnology
KIIT Deemed to be University

Journal Name: **Journal of Ethnopharmacology** **IF: 4.8**

Title: Paris polyphylla Sm. characterized extract infused ointment accelerates diabetic wound healing in In-vivo model

Author: Kshetrimayum V., Chanu K.D., Biona T., Kar A., Haldar P.K., Mukherjee P.K., Sharma N.

Details: Volume 331 , September 2024

Abstract: Ethnopharmacological relevance: The dried rhizome of Paris polyphylla Sm. is extensively used by traditional healers in India, China, and Vietnam to treat skin inflammation, cut wounds, uterine and traumatic bleeding, and cancer. Aim of the study: The traditional use of P. polyphylla rhizomes for treating wounds and bleeding has been reported previously. However, the potential of P. polyphylla in the treatment of diabetic wounds has not yet been explored. Our present study focused on the investigation of the wound-healing activity of P. polyphylla infused ointment in streptozotocin (STZ)-induced diabetic rats to validate the traditional claim. Materials and methods: Hydroalcoholic extract of the dried rhizomes of P. polyphylla were quantified by validated and optimized HPTLC (High-performance thin layer chromatography) method for Paris saponin VII, Dioscin and Polyphyllin V. The extract was used to prepare P. polyphylla ointments (5 and 10%). P. polyphylla ointment was subjected to physiochemical analysis and skin irritation test. Thirty STZ-induced diabetic adult male Wistar albino rats were divided into five groups (n = 6) and a circular excision wound was created. P. polyphylla ointment, ointment base (OB), and standard (STD) (Povidone Iodine 10%) were administered topically. The wound area of all groups were recorded every six days and compared with that of control. The epithelization period of each group was recorded. On day 18, the histopathological study of skin tissues of all groups was performed using hematoxylin and eosin (H&E) and Mallory's trichrome (MT). Results: Marker analysis and quantification of phytomolecules in hydroalcoholic extract ofP. Polyphylla were found to be of paris saponin VII (3.28 ± 0.08% w/w), dioscin (1.94 ± 0.12% w/w), and polyphyllin V (1.87 ± 0.84% w/w). A physiochemical study of P. polyphylla ointment showed that the prepared ointment was within an acceptable range and was not irritable to the skin. Daily topical administration of 10% P. polyphylla ointment (PP10) for 18 days completely healed the STZ-induced diabetic wounds. On day 18, the 5% P. polyphylla ointment (PP5) showed 99.1 ± 2.9% wound closure, while that of the standard and control was 78.4 ± 7.3% and 18.5 ± 5.9%, respectively. The epithelialization period of PP10 was 18 days, whereas that of the control was 28 days. Histopathological analysis of the progression of PP10 and PP5 wounds showed a decrease in inflammatory cells, regenerated epithelial layer, keratosis layer, hair follicles, fibroblasts, and collagen. Upon collagen intensity quantification of MT stained sections, an increase in collagen density of PP10 and PP5 treated groups was observed, showing accelerated wound healing potential of P. polyphylla extract in diabetic wounds compared to the standard ointment. Conclusion: This study suggested the potential of P. polyphylla rhizomes derived formulation to treat diabetic wounds, although the plant is traditionally used to treat normal wounds. The results indicate the validation of traditional claim, which has been explored commercially in industrial aspect.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0378874124005956?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: **American Journal of Pathology** **IF: 4.7**

Title: Aurora Kinase A Is Overexpressed in Human Retinoblastoma and Correlates with Histopathologic High-Risk Factors: Implications for Targeted Therapy

Author: Borah N.A.; Mittal R.; Sucharita S.; Rath S.; Kaliki S.; Patnaik S.; Tripathy D.; Reddy M.M.

Details: Volume 194, Issue 9 , September 2024

Abstract: Retinoblastoma (RB) is an intraocular malignancy initiated by loss of RB1 function and/or dysregulation of MYCN oncogene. RB is primarily tre ated with chemotherapy; however, systemic toxicity and long-term adverse effects remain a significant challenge necessitating the identification of specific molecular targets. Aurora kinase A (AURKA), a critical cell cycle regulator, contributes to cancer pathogenesis, especially in RB1-deficient and MYCN-dysregulated tumors. The current immunohistochemistry study in patient specimens (n = 67) indicated that AURKA is overexpressed in RB, and this elevated expression correlates with one or more histopathologic high-risk factors, such as tumor involvement of the optic nerve, choroid, sclera, and/or anterior segment. More specifically, AURKA is ubiquitously expressed in most advanced-stage RB tumors that show a suboptimal response to chemotherapy. shRNA-mediated depletion/pharmacologic inhibition studies in cell lines, patient-derived cells, in vivo xenografts, and enucleated patient specimens confirmed that RB cells are highly sensitive to a lack of functional AURKA. In addition, AURKA and N-myc proto-oncogene protein (MYCN) associate with each other to regulate their levels in RB cells. Overall, these results demonstrate a previously unknown up-regulation of AURKA in RB, facilitated by its crosstalk with MYCN. The elevated levels of this kinase may indicate unfavorable prognosis in tumors refractory to chemotherapy. This study provides a rationale and confirms that therapeutic targeting of elevated AURKA in RB could be a potential treatment approach.

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SCHOLARLY PUBLICATIONS
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Journal Name: **Bioorganic Chemistry** **IF: 4.5**

Title: Scaffold overlay of flavonoid-inspired molecules: Discovery of 2,3-diaryl-pyridopyrimidin-4-imine/ones as dual hTopo-II and tubulin targeting anticancer agents

Author: Saini M.; Paul S.; Acharya A.; Acharya S.S.; Kundu C.N.; Guchhait S.K.

Details: Volume 152, November 2024

Abstract: Almost half of all medicines approved by the U.S. Food and Drug Administration have been found to be developed based on inspiration from natural products (NPs). Here, we report a novel strategy of scaffold overlaying of scaffold-hopped analogs of bioactive flavones and isoflavones and installation of drug-privileged motifs, which has led to discovery of anticancer agents that surpass the functional efficiency of the original NPs. The analogs, 2,3-diaryl-pyridopyrimidin-4-imine/ones were efficiently synthesized by an approach of a nitrile-stabilized quaternary ammonium ylide as masked synthon and Pd-catalyzed activation–arylation methods. Compared to the NPs, these NP-analogs exhibited differentiated functions; dual inhibition of human topoisomerase-II (hTopo-II) enzyme and tubulin polymerization, and pronounced antiproliferative effect against various cancer cell lines, including numerous drug-resistant cancer cells. The most active compound 5l displayed significant inhibition of migration ability of cancer cells and blocked G1/S phase transition in cell cycle. Compound 5l caused pronounced effect in expression patterns of various key cell cycle regulatory proteins; up-regulation of apoptotic proteins, Bax, Caspase 3 and p53, and down-regulation of apoptosis-inhibiting proteins, BcL-xL, Cyclin D1, Cyclin E1 and NF-κB, which indicates high efficiency of the molecule 5l in apoptosis-signal axis interfering potential. Cheminformatics analysis revealed that 2,3-diaryl-pyridopyrimidin-4-imine/ones occupy a distinctive drug-relevant chemical space that is seldom represented by natural products and good physicochemical, ADMET and pharmacokinetic-relevant profile. Together, the anticancer potential of the investigated analogs was found to be much more efficient compared to the original natural products and two anticancer drugs, Etoposide (hTopo-II inhibitor) and 5-Flurouracile (5-FU).

URL: https://www.sciencedirect.com/science/article/abs/pii/S0045206824006436?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: Inorganic Chemistry Communications **IF: 4.4**

Title: Selective adsorption and removal of Congo red dye from waste water using catechol-stabilized reusable palladium nanoparticles.

Author: Mishra S.; Suryakanta U.; Das S.; Panigrahi B.; Kumar Parhi P.; Mandal D.

Details: Volume 167 , September 2024, Article No. 112738.

Abstract: Several industries including textile, dye manufacturing industries, paper and pulp industries discharge colored wastewater. The majority of synthetic dyes is composed of toxic azo compounds. Eradication of toxic azo dyes, organic pollutants, radioactive materials from the global ecosystem has received remarkable attention due to their detrimental effects on human health and ecosystem. Nanotechnology-based applications on catalytic degradation of contaminants from aqueous ecosystem have evolved as a major topic of research in the scientific community, to develop a cost-effective and energy-effective strategy. In this context, nanomaterials have gained much attention because of its unique physico-chemical properties. Herein, catechol-generated palladium nanoparticles (PdNPs) have been utilized for the selective removal of congo red dye from wastewater. In this study, Palladium nanocatalyst (4μg/ml) developed earlier by our group, was screened for degradation of dyes of different nature. The newly developed nanocatalyst was found to be effective against anionic dyes. Among the anaionic dyes, congo red was selected for degdradation study in detail. Complete degradation of congo red dye (CR) (150μM) is found to happen within 10 min. Besides catalytic degradation, the efficiency of the recycled catalyst was evaluated, which exhibits 60 % efficiency even after the 3rd cycle. Gas chromatography-mass spectrometry (GC–MS) characterization of the degraded products reveals the formation of benzidine, indicating the reductive cleavage of azo linkage of the dye.

In summary, the results highlight the potential development of a nanocatalyst for the selective and efficient removal of congo red, suggesting a simple,cost-effective, and reusable approach to prevent industrial pollutant in aqueous ecosystem.

URL: https://www.sciencedirect.com/science/article/pii/S1387700324007226?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: **Nanomaterials** **IF: 4.4**

Title: Chitosan Nanoparticle-Mediated Delivery of Curcumin Suppresses Tumor Growth in Breast Cancer

Author: Mishra, B; Yadav, AS; Malhotra, D; Mitra, T; Sinsinwar, S; Radharani, NNV; Sahoo, SR; Patnaik, S; Kundu, GC

Details: Volume 14, Issue 15, August 2024, Article number 1294

Abstract: Curcumin is a nutraceutical known to have numerous medicinal effects including anticancer activity. However, due to its poor water solubility and bioavailability, the therapeutic impact of curcumin against cancer, including breast cancer, has been constrained. Encapsulating curcumin into chitosan nanoparticles (CHNPs) is an effective method to increase its bioavailability as well as antitumorigenic activity. In the current study, the effects of curcumin-encapsulated CHNPs (Cur-CHNPs) on cell migration, targeted homing and tumor growth were examined using in vitro and in vivo breast cancer models. Cur-CHNPs possessed a monodispersed nature with long-term colloidal stability, and demonstrated significant inhibition of cell viability in vitro, which was potentiated by 5-Fluorouracil (5-FU). Outcomes of the in vivo imaging studies confirmed effective tumor targeting and retention ability of Cur-CHNPs, thereby suppressing breast tumor growth in mice models. Overall, the results demonstrated that Cur-CHNPs could be an effective candidate drug formulation for management of breast cancer.

URL: https://www.mdpi.com/2079-4991/14/15/1294

SCHOLARLY PUBLICATIONS
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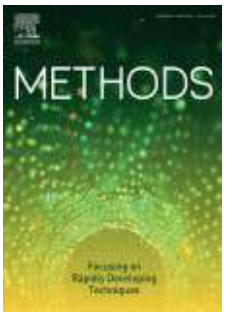
Journal Name: **Methods** **IF: 4.2**

Title: Optimisation ofLevilactobacillus brevis-fermented finger millet (Eleusine coracana) and evaluation of its effects on cancer cells (HCT116 and MDA-MB-231)

Author: Kumar Mahanta S, Pratikshya Nayak P, Muduli K, Elangovan S, Paramasivan SS, Kumar Mallick P, Kumar Mohapatra S, Kumar Panda S.

Details: Volume 229, September 2024

Abstract: he objective of this study was to optimise the millet formulation using *Levilactobacillus brevis* and to evaluate its anticarcinogenic potential *in vitro*. The formula was developed in the course of the fermentation of finger millet (*Eleusine coracana*) using *L. brevis* MTTC 4460 and optimised by response surface methodology and validation by artificial neural networking (ANN). The optimised millet formulation could be obtained using 2 % of bacterial inoculum, 2 % of glucose, and a fermentation duration of 3.3 days with a yield of 5.98 mg/mL lactic acid and 3.38 $\log_{10}$ (CFU/mL) viable *L. brevis* with overall desirability value of 1. The fermented millet formulation exhibited antiproliferative and antimigratory effects on MDA-MB-231 and HCT116 cancer cell lines. In addition, the outcomes observed in western blot analysis revealed that the formulation elicited apoptotic responses mediated by the Bcl-2 family of proteins in MDA-MB-231 and HCT116 cell lines while demonstrating no discernible impact on HEK293 normal cells.



URL: https://www.sciencedirect.com/science/article/abs/pii/S1046202324001506

Journal Name: Plant Science **IF: 4.2**

Title: A review on ubiquitin ligases: Orchestrators of plant resilience in adversity.

Author: Suranjika, S; Barla, P; Sharma, N; Dey, N

Details: Volume 347, October 2024, Article No. 112180.

Abstract: Ubiquitin- proteasome system (UPS) is universally present in plants and animals, mediating many cellular processes needed for growth and development. Plants constantly defend themselves against endogenous and exogenous stimuli such as hormonal signaling, biotic stresses such as viruses, fungi, nematodes, and abiotic stresses like drought, heat, and salinity by developing complex regulatory mechanisms. Ubiquitination is a regulatory mechanism involving selective elimination and stabilization of regulatory proteins through the UPS system where E3 ligases play a central role; they can bind to the targets in a substrate-specific manner, followed by poly-ubiquitylation, and subsequent protein degradation by 26 S proteasome. Increasing evidence suggests different types of E3 ligases play important roles in plant development and stress adaptation. Herein, we summarize recent advances in understanding the regulatory roles of different E3 ligases and primarily focus on protein ubiquitination in plant–environment interactions. It also highlights the diversity and complexity of these metabolic pathways that enable plant to survive under challenging conditions. This reader-friendly review provides a comprehensive overview of E3 ligases and their substrates associated with abiotic and biotic stresses that could be utilized for future crop improvement.

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SCHOLARLY PUBLICATIONS
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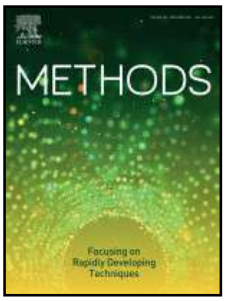
Journal Name: Methods **IF: 4.2**

Title: Optimisation of Levilactobacillus brevis-fermented finger millet (Eleusine coracana) and evaluation of its effects on cancer cells (HCT116 and MDA-MB-231).

Author: Mahanta, SK; Nayak, PP; Muduli, K; Elangovan, S; Paramasivan, SS; Mallick, PK; Mohapatra, SK; Panda, SK

Details: Volume 229, September 2024, Pages 30-40.

Abstract: The objective of this study was to optimise the millet formulation using *Levilactobacillus brevis* and to evaluate its anticarcinogenic potential *in vitro*. The formula was developed in the course of the fermentation of finger millet (*Eleusine coracana*) using *L. brevis* MTTC 4460 and optimised by response surface methodology and validation by artificial neural networking (ANN). The optimised millet formulation could be obtained using 2 % of bacterial inoculum, 2 % of glucose, and a fermentation duration of 3.3 days with a yield of 5.98 mg/mL lactic acid and 3.38 log10 (CFU/mL) viable *L. brevis* with overall desirability value of 1. The fermented millet formulation exhibited antiproliferative and antimigratory effects on MDA-MB-231 and HCT116 cancer cell lines. In addition, the outcomes observed in western blot analysis revealed that the formulation elicited apoptotic responses mediated by the Bcl-2 family of proteins in MDA-MB-231 and HCT116 cell lines while demonstrating no discernible impact on HEK293 normal cells.



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