SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: International Journal of Biological Macromolecules **IF: 8.7**

Title: Emerging roles of micropeptides in calcium cycling dysregulation and atrial fibrillation: A review

Author: Pani P.; Swalsingh G.; Sadayappan S.; Bal N.C.

Details: Volume 370, July 2026

Abstract: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia globally, marked by chaotic electrical impulses and irregular atrial contraction. At the cellular level, defective calcium (Ca+2) handling plays a central role in AF pathogenesis, with the sarco/endoplasmic reticulum Ca+2-ATPase (SERCA) pump being a critical determinant of intracellular Ca+2 reuptake and myocardial relaxation. Recent research has uncovered a class of small transmembrane micropeptides, phospholamban (PLB), sarcolipin (SLN), dwarf open reading frame (DWORF), myoregulin (MLN), endoregulin (ELN) and another-regulin (ALN), that directly modulate SERCA activity. Interestingly, these micropeptides exhibit chamber-specific expression and diverse regulatory mechanisms, functioning as inhibitors, uncouplers or facilitators of SERCA activity and are increasingly linked to atrial arrhythmogenesis. We explore evidence from genetically modified animal models and patient-derived data to elucidate how dysregulation of these peptides, particularly SLN and PLB, contributes to abnormal EC-coupling like Ca+2 cycling, delayed afterdepolarizations, oxidative stress and atrial remodeling. We also examine the influence of systemic metabolic regulators, such as thyroid hormones, catecholamines, dexamethasone and various exercise paradigms on micropeptide expression and function, offering insight into their intersection with AF progression. By dissecting the spatial, temporal and metabolic regulation of SERCA micropeptides, this review aims to offer current understanding about chamber-specific modulation of Ca+2 homeostasis and use these insights towards treatment of AF.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0141813026028503?via%3Dihub

SCHOLARLY PUBLICATIONS
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Journal Name: Materials Today Advances **IF: 8.0**

Title: Zein nanoparticles as emerging moderators of the gut microbiome: Mechanisms, biomedical potentials and translational challenges

Author: Dutta J.; Parashar R.; Mishra S.; Kumari S.; Kujawska M.; Kaushik N.K.; Ghosh A.; Verma S.K.

Details: Volume 30, June 2026

Abstract: Zein, a hydrophobic prolamin protein derived from maize, has emerged as a sustainable material for oral nanocarrier design due to its biodegradability, biocompatibility, and spontaneous self-assembly into stable NPs. This review critically examines the synthesis strategies, physicochemical behavior, and biological performance of zein NPs (ZNPs) with particular emphasis on gastrointestinal delivery and microbiome-associated outcomes. Current evidence indicates that ZNPs act primarily as protective and transport matrices: their intrinsic properties govern gastric resistance, mucus interaction, and controlled intestinal release, thereby improving stability and bioavailability of encapsulated compounds. The review insights into the microbiome pathway within a carrier-enabled exposure framework to correlate the attributing causality by ZNPs in the frame of the reported alterations in microbial composition, metabolite production, and host physiology arising from delivered bioactive (e.g., drugs, polyphenols, or probiotics). Moreover, the study details the advances in fabrication approaches, including desolvation, electrospraying, flash nanoprecipitation, and microfluidic micromixing, which have improved particle uniformity and scalability, supporting applications in pharmaceutical and nutraceutical delivery. Future progress will require integrating empty-carrier controls, longitudinal microbiome analyses, harmonized production standards, and nano-specific regulatory evaluation frameworks. Establishing these criteria will enable rational design of zein-based systems as controlled oral delivery platforms rather than assuming intrinsic microbiome-modulating activity.

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SCHOLARLY PUBLICATIONS
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Journal Name: Environmental Research **IF: 7.7**

Title: Imperative implication of microplastics as vital agent for salmonellosis inducing biofilms, antibiotic resistance, and health risk

Author: Asima, SP; Mayur, A; Sonalisha, S; Parashar, R; Batsya, I; Sinha, A; Raina, V; Suar, M; Verma, SK

Details: Volume 297, May 2026

Abstract: Microplastics (MPs) have emerged as dynamic microbial interfaces that reshape pathogen ecology, antibiotic resistance evolution, and disease transmission. This review examines how MPs function as reservoirs and vectors for *Salmonella enterica*, highlighting the plastisphere as a stable biofilm microhabitat that enhances bacterial adhesion, environmental persistence, stress tolerance, and virulence expression. We summarize evidence that MP surfaces especially weathered, hydrophobic polymers, promote dense biofilms that protect *Salmonella* from desiccation, UV exposure, sanitization, and antimicrobial agents. Within these structured communities, co-localization of *Salmonella* with antibiotic residues, heavy metals, and diverse microbial taxa accelerates horizontal gene transfer and co-selection of antibiotic resistance genes and virulence determinants. MPs thereby act as mobile genetic "incubators" that disseminate multidrug-resistant *Salmonella* across soil, aquatic systems, wastewater networks, food production environments, and host microbiomes. These interactions link environmental contamination with zoonotic and foodborne transmission pathways, constituting a critical One Health concern. We identify current methodological gaps and propose research priorities for mechanistic risk assessment, monitoring frameworks, and intervention strategies. Recognizing MPs as active ecological players rather than inert pollutants is essential for mitigating their role in the global spread of pathogenic and antimicrobial-resistant *Salmonella*.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0013935126004184?via%3Dihub

SCHOLARLY PUBLICATIONS
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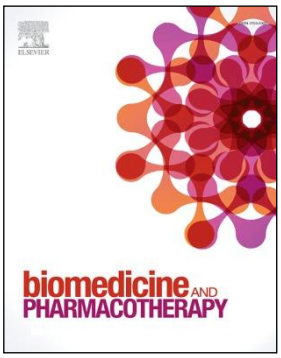
Journal Name: Biomedicine and Pharmacotherapy **IF: 7.5**

Title: Corrigendum to "The posterity of Zebrafish in paradigm of in vivo molecular toxicological profiling" (Biomedicine & Pharmacotherapy, (2024), 171, C, (116160), (S0753332224000416), 10.1016/j.biopha.2024.116160)

Author: Verma S.K.; Nandi A.; Sinha A.; Patel P.; Mohanty S.; Jha E.; Jena S.; Kumari P.; Ghosh A.; Jerman I.; Chouhan R.S.; Dutt A.; Samal S.K.; Mishra Y.K.; Varma R.S.; Panda P.K.; Kaushik N.K.; Singh D.; Suar M.

Details: Volume 199, June 2026

Abstract: This Corrigendum relates to the above article. In this article, the authors have included references [4, 6, and 59] that require correction due to contextual inappropriateness: [4] M. Harper Book of the month: MMR: science and fiction, J. R. Soc. Med., 97 (2004), pp. 552–553, 10.1177/014107680409701115 [6] C. Yu, R. Chen, J.J. Li, J.J. Li, M. Drahansky, M. Paridah, A. Moradbak, A. Mohamed, H. abdulwahab taiwo Owolabi, FolaLi, M. Asniza, S.H. Abdul Khalid, T. Sharma, N. Dohare, M. Kumari, U.K. Singh, A.B. Khan, M.S. Borse, R. Patel, A. Paez, A. Howe, D. Goldschmidt, C. Corporation, J. Coates, F. Reading, We are IntechOpen, the world ' s leading publisher of Open Access books Built by scientists, for scientists TOP 1%, Intech, 13 (2012), 10.1016/j.colsurfa.2011.12.014 [59] E. Duffey Global biodiversity: status of the earth's living resources, Biol. Conserv., 66 (1993), p. 145, 10.1016/0006–3207(93)90147-s The authors confirm that these references were inadvertently introduced in the article. The updated references for [4, 6 and 59] should be as below: [4] J. Payne-James, Clinical Toxicology: Principles & Mechanisms, J. R. Soc. Med. 97 (2004) 554–555. https://doi.org/10.1177/014107680409701117. [6] R. Nagel, K. Isberner, Testing of chemicals with fish — a critical evaluation of tests with special regard to zebrafish, Fish Ecotoxicol. (1998) 337–352. https://doi.org/10.1007/978–3-0348–8853-0_11. [59] R. Turner. Acute toxicity: The determination of LD50. Screening Methods In Pharmacology.



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SCHOLARLY PUBLICATIONS
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Journal Name: Frontiers in Immunology **IF: 7.0**

Title: Evaluation of a multi-component mucoadhesive buccal patch: cytokine-associated inflammatory responses and tissue remodeling in experimental models

Author: Kokkanti, RR; Viswanathan, S; Parida, N; Biswas, S; Kushwaha, GS; Deheri, PK; Panda, AK; Panda, A; Bajoria, AA; Patnaik, S

Details: Volume 17, May 2026

Abstract: Introduction Dysregulated cytokine signaling is implicated in persistent inflammation and fibrosis in oral submucous fibrosis (OSMF) and has been reported in association with pathways observed in oral squamous cell carcinoma (OSCC). This study investigated cytokine associated inflammatory and fibrotic responses following treatment with a mucoadhesive buccal patch containing isotretinoin, bromelain, and limonene.Methods The formulation was evaluated using lipopolysaccharide (LPS) induced acute inflammatory in vitro models and a carbon tetrachloride (CCl4) induced in vivo oral fibrotic model. Gene expression analysis was performed using qPCR to assess IL-6, TNF-alpha, MMP-2, IL-2, and TGF-beta expression. Histological analysis and functional assessment of mouth opening were conducted in vivo to evaluate fibrotic alterations.Results LPS stimulation induced upregulation of IL-6, TNF-alpha, and MMP-2, while treatment with the formulation was associated with reduced expression of these inflammatory markers. Altered IL-2 and TGF-beta expression suggested modulation of immune regulatory and fibrosis-associated pathways. Protein analysis demonstrated reduced COX-2 expression and alterations in CK17 levels, consistent with changes in inflammatory and epithelial responses. Discussion These findings provide preliminary observations on cytokine-associated responses under inflammatory and fibrotic conditions relevant to OSMF. Further studies are required to define underlying mechanisms and evaluate translational applicability.

URL: https://www.frontiersin.org/journals/immunology/articles/10.3389/fimmu.2026.1847576/full

SCHOLARLY PUBLICATIONS
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Journal Name: Biomaterials Advances **IF: 6.0**

Title: In vitro and ex vivo evaluation of a papain-loaded mucoadhesive buccal patch with potential antifibrotic and anticancer activity

Author: Parida, N.; Kokkanti, R.R.; Biswas, S.; Abikshyeet, A.; Patnaik, S.; Bajoria, A.A.

Details: Volume 182, May 2026

Abstract: Oral submucous fibrosis (OSMF) and oral squamous cell carcinoma (OSCC) are characterized by aberrant extracellular matrix remodeling, chronic inflammation, and limited responsiveness to current local treatment modalities. In this study, we report the design and in vitro / ex vivo evaluation of a papain-loaded bilayer mucoadhesive buccal patch as a proof-of-concept platform for localized enzyme delivery. Papain, a plant-derived cysteine protease with collagenolytic activity, was incorporated into a biocompatible polymeric matrix to enable controlled, site-specific release within the buccal environment. The optimized formulation exhibited acceptable physicochemical properties, including uniform thickness, flexibility, near-neutral surface pH, sustained hydration, and controlled papain release within a clinically relevant residence window. In vitro biological evaluation demonstrated differential responses in HGF and CAL-27 cells, with reduced cytotoxicity toward normal fibroblasts and decreased viability, clonogenicity, migration, invasion, and three-dimensional spheroid outgrowth in carcinoma cells under experimental conditions. Ex vivo collagen degradation studies using rat tail tissue further supported the ability of the formulation to interact with collagen-rich matrices. Hemocompatibility testing indicated minimal hemolysis, suggesting preliminary blood compatibility. Collectively, these findings establish the formulation feasibility and biological plausibility of a papain-loaded mucoadhesive buccal patch (P-MABP) as a localized enzyme delivery system. While the results support its potential relevance for fibrotic and neoplastic oral conditions, further in vivo studies and mechanistic investigations are required to define therapeutic efficacy, safety, and translational applicability.

URL: https://www.sciencedirect.com/science/article/pii/S2772950826000294

SCHOLARLY PUBLICATIONS
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Journal Name: Materials Chemistry and Physics **IF: 5.2**

Title: Intraoral biocompatible mucoadhesive buccal patch imbued with bromelain for targeting oral fibrosis: Evaluation of functional activity, cytotoxicity, and safety

Author: Kokkanti R.R.; Bajoria A.A.; Parida N.; Viswanathan S.; Pritam P.; Kumar N.S.; Kushwaha G.S.; Panda A.K.; Veeraraghavan G.; Patnaik S.

Details: Volume 361, August 2026

Abstract: A bromelain-loaded mucoadhesive buccal patch was developed for enzymatic therapy in oral submucous fibrosis (OSF), a progressive fibrotic disorder characterized by excessive collagen deposition. The patch was analytically characterized for content, release kinetics, and enzymatic stability. HPLC and LC-MS/MS confirmed bromelain content and integrity, while in vitro release studies demonstrated near-complete release within 90 min in phosphate-buffered saline and artificial saliva. Zymography revealed 76.67 U/mL enzymatic activity at 2 h, even after 6 months of storage, confirming long-term stability. LC-MS peptide mapping validated collagen degradation. Ex vivo studies showed prolonged mucoadhesion (~137 min), supporting effective mucosal retention. HPLC confirmed drug purity. Biological assays including MTT, colony formation, wound healing, and live/dead staining indicated selective cytotoxicity and apoptosis in KB-3-1 oral cancer cells, with high viability of normal fibroblasts. Acute toxicity studies in rats revealed no systemic toxicity or organ damage. Together, these findings establish a robust analytical and biological profile for the patch, supporting its potential as a non-invasive, enzyme-based therapy for OSF. Future studies will focus on dose optimization, long-term in vivo efficacy, and translational potential.

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SCHOLARLY PUBLICATIONS
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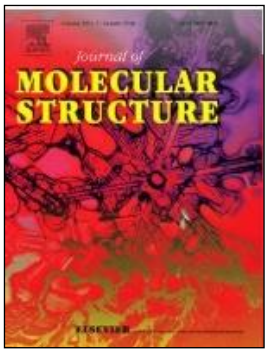
Journal Name: Journal of Molecular Structure **IF: 4.9**

Title: Tetranuclear defective dicubanes of vanadium complexes: Synthesis, characterization and their potential biological activities

Author: Singh A.R.; Rajpurohit A.S.; Khongsai L.; Singh S.A.; Chingakham B.S.; Jaccob M.; Lonibala R.

Details: Volume 1373, October 2026

Abstract: Four tetranuclear V(V) complexes 1-4 with unique $\{V_4O_8\}$ defective dicubane cores were synthesized through novel route under methanolic condition using bis(acetylacetonato) oxovanadium(IV) precursor along with 2,2′-bipyridine and substituted 2,2′-bipyridine ligands i.e. 2,2′-bipyridine in (1), 4,4′-dimethyl-2,2′-bipyridine (2), 5,5′-dimethyl-2,2′-bipyridine (3) and 4,4′-dimethoxy-2,2′-bipyridine (4). The complexes are characterized on the basis of CHN, UV-visible, IR and SC-XRD analysis data. Single-crystal X-ray diffraction analysis revealed the solid-state structures of all complexes (1-4) with distorted octahedral geometries for the four V(V) ions. The electronic nature of the complexes and their molecular surfaces were investigated using density functional theory (DFT) and Hirshfeld surface analysis. In vitro antidiabetic studies indicated that the complexes possess good antidiabetic activities against α-glucosidase and in vitro studies of anticancer activities against A549 cells, complex 3 shows better activity with IC_{50}= 2.5±1.07 µM.



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SCHOLARLY PUBLICATIONS
School of Biotechnology
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Journal Name: Journal of the Science of Food and Agriculture **IF: 4.0**

Title: Advantages of low-glycaemic-index carbohydrates in regulating glycaemic response of energy bar: A review

Author: Sasikumar, R; Gupta, A; Kumar, TS; Ganesan, K; Haorongbam, S; Rajarathinam, R; Janghu, S; Panda, SK; Jaiswal, AK

Details: June 2026

Abstract: Energy bars are widely consumed functional foods among athletes and physically active consumers who require convenient sources of sustained energy. Their carbohydrate composition, particularly the type and ratio of digestible sugars such as glucose, fructose and sucrose, strongly influences glycaemic index (GI), postprandial blood glucose response and subsequent metabolic outcomes. GI reflects the rise in blood glucose after food consumption relative to a reference carbohydrate - usually glucose. Low-GI carbohydrates are digested and absorbed more slowly, resulting in a moderated insulin response and potentially greater reliance on fat oxidation during exercise.. Evidence from formulation studies indicates that partial substitution of sucrose with inulin and FOS can reduce GI while maintaining energy density. For example, replacement of approximately 15% sucrose with inulin/FOS in papaya-based fruit bars reduced GI from about 65 to 54, while energy density remained within 3260-3350 kcal kg-1. Such formulations may produce lower postprandial glucose and insulin responses, support steadier blood glucose availability and promote substrate utilization patterns favourable for endurance performance. Standardizing sugar replacement strategies using ingredients such as inulin, FOS and selected sugar alcohols may support the development of energy bars with improved glycaemic control, sustained energy release and potential benefits for sports nutrition and metabolic health.

URL:
https://scijournals.onlinelibrary.wiley.com/doi/epdf/10.1002/jsfa.70775?getft_integrator=clarivate&src=getftr&utm_source=clarivate

SCHOLARLY PUBLICATIONS
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Journal Name: Journal of Pharmaceutical Sciences **IF: 3.8**

Title: Cocrystals of telmisartan with ascorbic acid: Enhanced solubility and antiviral potency against Japanese encephalitis virus

Author: Regu V.R.; Datey A.; Vitthal T.K.; Swain R.P.; Kumar S.; Chattopadhyay S.; Subudhi B.B.

Details: Volume 115, Issue 5, May 2026

Abstract: The significant impact of Japanese encephalitis virus (JEV) on society and the lack of any approved antiviral drugs demand urgent attention. Considering the prohibitive cost involved in new antiviral development, repurposing existing drugs is an alternative strategy. Telmisartan (TM) is a prime candidate for repurposing against JEV due to its ability to inhibit JEV infection. Poor aqueous solubility of TM can be a major hurdle in harnessing its repurposing against JEV. Cocrystallization with appropriate coformers has the scope to improve solubility and antiviral properties. The cocrystal showed adequate stability under refrigeration conditions. Using valid analytical methods, the solubility of the cocrystal was found to be enhanced by 81-fold compared to TM. The significant increase in solubility was also associated with a significant enhancement in ex vivo intestinal permeability of the cocrystal (60%) compared to that of TM (28%). Antiviral assay revealed a 2-fold enhancement in the potency of the cocrystal. This was also associated with a significant increase in selectivity index (29) as compared to TM (14.18), indicating its enhanced antiviral properties. Cocrystallization with Asca enhanced solubility, ex vivo permeability, and antiviral properties of TM, which can encourage its further progress with validation in preclinical and clinical conditions.

URL: https://www.sciencedirect.com/science/article/abs/pii/S0022354926000687?via%3Dihub