Heliyon 11 (2025) e41198

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Genetic variations and clinical significance in young-onset nasopharyngeal cancer: Analysis of EBV interaction with cellular receptor variants and viral glycoproteins

Sulistyo Emantoko Dwi Putra [a], Farizky Martriano Humardani [b,c,d,*], Hikmawan Wahyu Sulistomo [b], Yulanda Antonius [a], Jonathan Jonathan [a], Riyan Charlie Milyantono [d], Artika Uthary [d], Risma Ikawaty [d]

[a] Faculty of Biotechnology, University of Surabaya, Surabaya, 60292, Indonesia
[b] Magister in Biomedical Science Program, Faculty of Medicine Universitas Brawijaya, Malang, 65112, Indonesia
[c] Bioinformatics Research Center, Indonesia Bioinformatics and Biomolecular, Malang, 65162, Indonesia
[d] Faculty of Medicine, University of Surabaya, Surabaya, 60292, Indonesia

ARTICLE INFO

Keywords:
EBV
Genetic variant
In-silico
Nasopharyngeal cancer
NRP1

ABSTRACT

Nasopharyngeal cancer (NPC), although rare in young individuals worldwide, is significantly influenced by the Epstein-Barr virus (EBV). Considering EBV's widespread prevalence, understanding its role in NPC's future occurrence, disease progression, clinical symptoms, metastatic tendencies, and prognosis is crucial. In this study, we extensively analyzed two young patients with NPC, who displayed distinct clinical features. We utilized Whole Exome Sequencing (WES), concentrating on EBV-interacting receptors, and applied advanced in silico methods for a deeper investigation. These methods included structural analysis via SWISS-MODEL, stability assessments using PremPS, and molecular docking studies with ClusPro. Our focus was to analyze genetic variants identified by WES and confirm EBV presence using RT-qPCR. Our comparative study between the two subjects showed that the first had milder symptoms and a lower metastasis than the second. In the first subject, we identified unique genetic variants: NRP1 c.536T > C (p.Val179Ala) and MYH9 c.4876A > G (p.Ile1626Val). Notably, the NRP1 p.Val179Ala variant caused structural changes leading to protein instability. Molecular docking suggested that this variant enhances interaction more than the wild-type. RT-qPCR validation of EBV showed lower levels in subject one (mutant-NRP1) compared to subject two (wild-type-NRP1). This finding implies that the p.Val179Ala variant in subject one could obstruct EBV entry, possibly leading to less severe clinical symptoms Our research provides new insights into the genetic factors influencing the clinical presentation of NPC, identifying promising targets for further research and therapeutic interventions. However, additional validation in a larger cohort is required to elucidate the broader impact of these genetic variants.

* Corresponding author. Veteran Street, Ketawanggede, Lowokwaru Subdistrict, Malang City, East Java 65145, Indonesia
E-mail address: farizky946@gmail.com (F.M. Humardani).

https://doi.org/10.1016/j.heliyon.2024.e41198
Received 16 January 2024; Received in revised form 11 December 2024; Accepted 12 December 2024
Available online 13 December 2024

1. Introduction

Nasopharyngeal cancer (NPC) is an epithelial tumor originating from the pharyngeal recess of the nasopharynx. Predominantly diagnosed around the age of 50, NPC is twice as prevalent in males as it is in females. The incidence rates among males display two distinct peaks: the first between 30 and 39 years of age, and the second between 50 and 59 years of age. Conversely, age-specific incidence rates are at their lowest in the younger population, specifically within the 10 to 29-year age range. Furthermore, epidemiological studies have identified individuals of Asian descent as being particularly vulnerable to NPC [1–3].

The Epstein-Barr virus (EBV) has a significant correlation with NPC. Lower EBV levels are associated with reduced progression and decreased survival rates, whereas higher EBV levels are linked to increased progression and improved survival rates [4]. This suggests that EBV plays a crucial role in the progression of NPC rather than in its initiation. Infection by EBV is managed by several receptors, including ITGB6, EphA2, NRP1, and MYH9 [5]. Despite this, there have been no clinical studies so far that have successfully determined the underlying mechanisms of these receptors in relation to EBV. The most recent research only identified a variant of ITGB6 present in NPC [6], yet the precise mechanism by which this gene variant contributes to the disease remains unknown.

In this study, we focused on two young patients diagnosed with NPC, who displayed distinct clinical manifestations and disease progression patterns despite having the same onset. To explore this, we employed whole exome sequencing (WES) to thoroughly investigate their genetic profiles, specifically targeting receptors interacting with EBV. Recognizing that genetic variants can significantly affect protein expression at multiple levels, possibly altering protein function to enhance, reduce, or completely eliminate its activity, we utilized an in-silico approach. This methodology was employed to assess the structural changes in the proteins and their interactions with EBV and receptors using molecular docking as influenced by the identified variants. To our knowledge, this is the first study in the context of NPC that integrates WES and in silico analysis. This novel approach aids in a better understanding of how genetic variations can influence protein function.

2. Materials and methods

2.1. Subject of study

This study involves subjects with young-onset NPC from East Java, Indonesia. The inclusion criteria specify that the patients must be diagnosed with young-onset NPC (under 20 years old), with confirmation of the diagnosis via CT-scan and Fine Needle Aspiration Biopsy (FNAB). The exclusion criteria encompass patients who have already undergone radiochemotherapy. Patient or guardian must give concern to including this study and this study was approved by Ibnu Sina General Hospital, Gresik, East Java, Indonesia (02/437.76/2023).

2.2. Sample preparation, analysis and validation of Epstein-Barr virus

A 5 mL blood sample was collected during a routine examination and was immediately frozen at −80 °C for preservation. Genomic DNA was then extracted from this sample using the FavorPrep™ Tissue Genomic DNA Extraction Mini Kit. In this study, we utilized specific primers for the validation of EBV, targeting the BamHI-W region and BALF5, as outlined in Supplementary Table 7. These primers and the methodology are based on previous research, referenced in studies [7,8], and the detection was performed using the Bio-Rad CFXDuet system. For sequencing, the DNA was processed using the Illumina NovaSeq 6000 system.

The WES data underwent comprehensive analysis. Sequence reads were aligned to the hg19 reference genome, followed by the removal of duplicate reads to enhance alignment precision. Variant calling was subsequently performed. To ensure the integrity and quality of the sequencing data, we employed MultiQC, a tool that integrates numerous bioinformatics quality control metrics from trimming through to variant calling [9]. The WES data thus obtained were thoroughly analyzed using MultiQC for comprehensive evaluation [9], reads were aligned to the hg19 reference genome, the alignments were refined by removing duplicate reads and variant calling using MultiQC [9]. Annotation was performed using Franklin (https://franklin.genoox.com/clinical-db/home), along with COSMIC, cBioPortal, Kaviar, ClinVar, and gnomAD, as well as published articles for supplementary annotation.

2.3. In-silico method

An in-silico approach was utilized to establish the structure of the protein in the variant result, with molecular docking employed to ascertain the interactions between the mutant and wild-type receptors. The wild-type receptor and EBV envelope were sourced from UniProt (https://www.uniprot.org/), while the mutant receptor was created by substituting the protein sequence with the variant obtained from WES. Both the wild-type and mutant receptors addressed for 3D modeling by using homology modelling and their structures were evaluated using SWISS-MODEL [10]. Further assessment of these structures was carried out using PremPS for an in-depth understanding [11]. To investigate the interaction between receptors, specifically NRP1, MYH9, and EBV, we focused on the interaction via the EBV envelope proteins gH/gL and gB by using ClusPro webserver for molecular docking [12].

To evaluate the homology in our molecular docking, we devised both qualitative and quantitative analysis methods. For the qualitative approach, we employed the superimposition method to overlay the wild-type and mutant docking models. Quantitatively, we examined the similarity of binding sites. Drawing from a prior study, models are typically considered homologous if they exhibit 75 % similarity in binding sites [13]. However, the protein mutations are acknowledged by structural changes of protein. The cut-off 70 % was addressed for analysis. The quantification of protein homology is determined using the formula:

$$\text{Protein Homology Percentage } (\%) = \frac{a}{b} x100\%$$

Where:

a = Number of matching receptor-ligand interactions between the wild-type and mutant models.

b = Total receptor-ligand interactions observed in the wild-type model.

3. Results

3.1. Characteristics of subject

This study involves two subjects with young-onset NPC from East Java, Indonesia. Despite the simultaneous onset of the disease in both patients, they presented differing clinical manifestations and rates of progression. The first subject's tumor size was smaller compared to the seconds. Moreover, the second subject exhibited more severe clinical manifestations than the first (Table 1).

Despite having the same disease onset, subjects one and two exhibited differences in the magnitude of NPC mass, as shown by three-dimensional CT scan results. The NPC mass in subject two was larger and metastatic than that in subject one. In subject two, the mass had infiltrated Rosenmüller's fossa, the nasal cavity, auditory tube, parotid gland, and had extended to the cervical region (Fig. 1(a and b), Supplementary Fig. 1 and Supplementary Fig. 2).

Two subjects were referred to the same hospital for further treatment with the same protocol. After one year of follow-up, the first subject underwent serial FNAB, all of which indicated a cancer-free status. However, the second subject passed away three months after their initial visit to our clinic. To gain a better understanding of the differences in clinical manifestations between the subjects, we performed WES.

3.2. Genetic variants of receptors identified through WES

We identified four genes associated with nasopharyngeal carcinoma (NPC), including XPC, HCG9, GABBR1, and TP53 (Supplementary Table 2). In whole exome sequencing, 17 % of the genetic variants in subject one are identical to those in subject two. The genetic variants that differ between subject one and subject two account for 6 % of the total variants in subject one (Supplementary Table 3). Further analysis focused on receptors known to interact with EBV, as EBV is a known factor that increases progression and lowers survival rates [4]. These receptors may play a role in the differential manifestations observed in both subjects. Specifically, we analyzed EPHA2, ITGB6, NRP1, and MYH9 (Supplementary Table 1).

We annotated all variants as benign using the annotation tool from the Franklin database. Intriguingly, the variant in subject one not only differs from that in subject two but also results in a protein mutation. Specifically, subject one exhibits variations from subject two in the NRP1 gene (NM_003873.7:c.536T > C, p.Val179Ala), resulting in the alteration of the A allele to the G allele, leading to a substitution of valine with alanine at position 179. Additionally, variations in the MYH9 gene (NM_002473.6:c.4876A > G, p.Ile1626Val) result in the alteration of the T allele to the C allele, leading to a substitution of isoleucine with valine at position 1626 (Supplementary Fig. 4). These genetic variations are common in the general population, particularly among Asians, as evidenced by the Franklin database. Given the disparities in clinical manifestations and disease progression between the two subjects, we conducted further in silico analysis on these variants.

3.3. Alterations and instability in protein structure due to NRP1 mutation

To evaluate the three-dimensional structure of the protein, we calculated the protein structure based on template homology. Given that our target protein is already in the database, we employed SWISS-MODEL for our analyses. The NRP1 mutation p.Val179Ala is located in domain, while the p.Ile1626Val is situated in the coiled coil region of MYH9 (Supplementary Fig. 4). For focused structural analysis and subsequent molecular docking, we considered only the locations affected by these mutations. The sequences used were

Table 1
Characteristics of young patient with NPC.

Characteristics	Subject One	Subject Two
Age at diagnosis	14 years 9 months	16 years
Onset of neck mass	±6 months	±6 months
Progressivity of neck mass	Slow	Fast
Epistaxis	Infrequent	Frequent
Tinitus	Infrequent	Frequent
Headache	Infrequent	Frequent
FNAB	Non keratinizing Squamous cell carcinoma, undifferentiated subtype	Non keratinizing Squamous cell carcinoma, undifferentiated subtype
Stage of cancer	III	IVA

Note: Slow: indicating a gradual increase; Fast: indicating a rapid increase. "Infrequent": meaning the symptom occurs rarely; Frequent: meaning it occurs often.

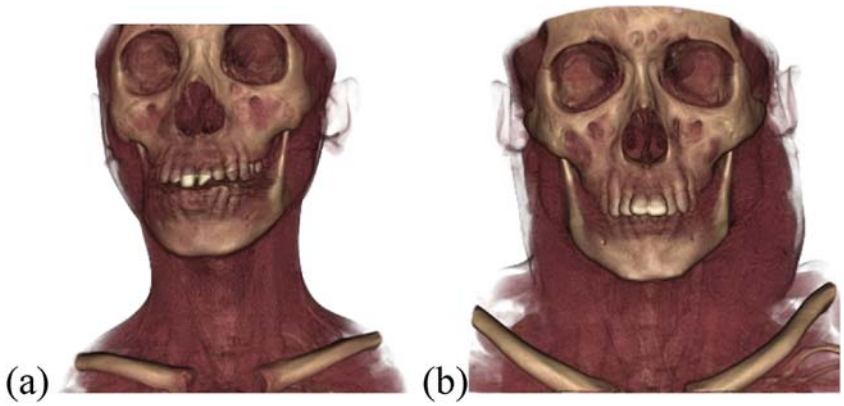


Fig. 1. Three-dimensional CT scans. (a) subject 1; (b) subject 2.

obtained from the UniProt database with several modifications limited to the affected sequences (Supplementary Table 4). It is worth noting that the wild-type protein sequence is available on the UniProt website without any alterations.

This research conducted through investigation into the structural attributes of two models of MYH9. Remarkably, both samples exhibited a consistent level of quality as evidenced by their identical molprobity scores of 0.83 and ramachandran favoured percentages of 98.81 %. Upon close examination of the NRP1 protein models, notable variations were observed. The NRP1 wild-type exhibited a ramachandran favoured percentage of 96.55 %, suggesting a robust structural conformation. On the other hand, the mutant NRP1 p.Val179Ala exhibited a marginal decrease, with a recorded value of 94.83 %. Furthermore, there was a variation in the molprobity scores observed between the NRP1 wild-type (0.91) and the mutant (1.08). The observed divergence between the wild-type and mutant specimens highlights the possibility of structural disparities in the mutant variant (Supplementary Table 5).

In order for strengthening our analysis, we employed PremPS for the purpose of validation. In the present assessment, the mutant NRP1 p.Val179Ala exhibited a ΔΔG value of 2.73, indicating a significant alteration in the protein's stability. Furthermore, it is worth noting that the mutation is located within the core region of the protein. In contrast, the MYH9 p.Ile1626Val protein variant exhibited a ΔΔG value of 0.04, whereby the mutation was observed on the protein's surface conformation (Supplementary Table 6).

3.4. NRP1 mutant increase interaction energy with EBV binding, but not in MYH9 mutant

To analyze the interactions between protein mutations and EBV, we utilized molecular docking. However, challenges arose: the binding sites for NRP1 and MYH9 were not found in existing databases or literature, leading us to employ blind docking with ClusPro. We identified 14 models for MYH9-gB in both mutant and wild-type forms and 20 models for MYH9-gH/gL in both mutant and wild-type forms. For NRP1, we identified 20 models across all docking experiments. To further refine our analysis, we labeled the positions as follows: position 0 is NRP1-gB model 0, and position 2 is NRP1-gB model 2. The model with the lowest number model indicates the best binding interaction.

A further complication emerged when comparing the wild-type to the mutant. Because of our dependence on blind docking, solely

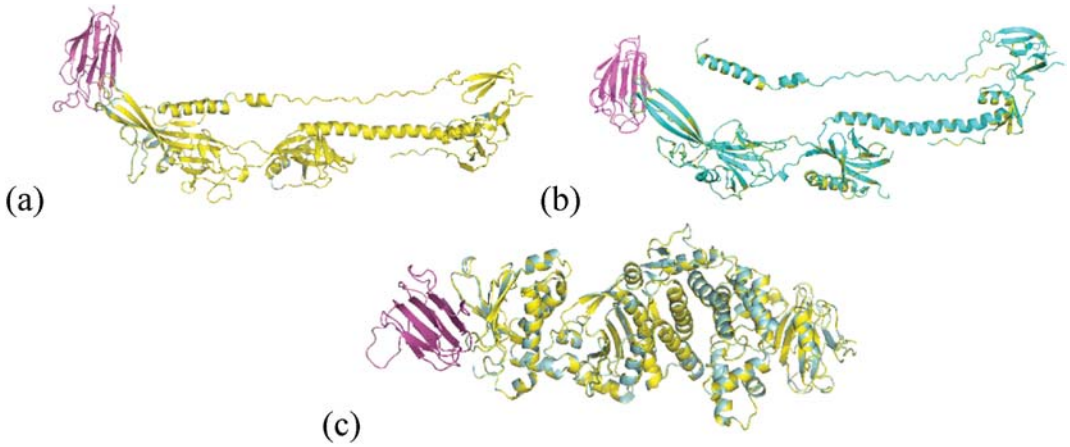


Fig. 2. Qualitative Evaluation of Blind Docking Results on both Wild-Type and Mutant Models with the EBV Envelope. a) NRP1-gB 1; b) NRP1-gB 2; c) NRP1-gH/gL 1.

relying on numerical homology between models was not feasible. To address this, we developed a method that integrates both qualitative and quantitative analyses for each docking model, ensuring distinction between the wild-type and mutant.

In our initial assessment, we utilized a qualitative evaluation through PyMOL to superimpose all the complexes formed by blind docking. We identified one homolog in NRP1-gH/gL and another in NRP1-gB (Fig. 2(a–c)). For MYH9, there are six models each for MYH9-gB and MYH9-gH/gL (Supplementary Fig. 5). To further refine our findings, we conducted a quantitative evaluation, ensuring that the binding site in the mutants was at least 70 % similar to that of the wild-type. This threshold was based on a previous study that identified molecular unknowns [13]. Based on this criteria, we excluded the NRP1-gB model 2 vs 0 and MYH9-gB 1 vs 1 from our evaluation, as did not meet the required cut-off value (Table 2 and Supplementary Table 5).

We subsequently assessed the molecular docking values between the wild-type and mutants for both NRP1 and MYH9. For the model NRP1-gB, the values for 0 vs 2 (number 1) and 1 vs 3 (number 2) were −7 and −20.4, respectively. For NRP1-gH/gL, the value for 0 vs 3 (number 1) was −61.4 (Table 3). In contrast, for MYH9, only minimal differences were observed. For MYH9-gB, the differences were −0.1 and −1.6. Notably, in the case of MYH9-gH/gL, all observed differences equated to zero as indicated in Supplementary Table 6. This highlights the critical role of mutations in the core region in maintaining protein stability and facilitating molecular interactions. Notably, this finding is corroborated by data in Supplementary Fig. 6, which demonstrates a reduced EBV yield in subject one compared to subject two.

4. Discussion

Young-onset NPC is uncommon, and the presence of the EBV can significantly impact its progression, metastatic potential, and overall prognosis. Globally, EBV infections are pervasive, with a prevalence exceeding 90 % [14]. Notably, there is a rising trend of EBV infections among young individuals in the Asian population [15]. This surge in infections raises concerns since EBV can act as a precursor to NPC. Given these factors, there's an imperative need to devise strategies to prevent the spread of EBV, thereby reducing the potential risk of NPC in younger populations.

In this investigation, we elucidated distinct variants between two young patients with NPC that exhibited differing clinical manifestations, including disease progression and metastatic profiles. This phenotypic disparity may be influenced by the presence of the p.Val179Ala. Our results suggest that this specific allele might play a protective role in the context of NPC. In-depth analysis revealed that this NRP1 variant notably impacts the structural integrity and stability of the NRP1 protein, more so than the p.Ile1626Val. This pronounced effect can be attributed to the location of the mutation: the NRP1 protein mutation is situated within its core, whereas the MYH9 mutation is present on its surface. Historically, mutations localized within the core of proteins are recognized to induce significant alterations to both the structure and stability of the protein, which might further explain our findings [16].

Subsequent to our structural findings, molecular docking was utilized to further characterize the interactions of the mutated proteins NRP1 and MYH9 with EBV. Distinctly, only minor differences were evident between the wild-type MYH9 and its mutant form in relation to the EBV envelope protein gB. In contrast, there were no discernible differences in their interactions with the envelope protein gH/gL. In the context of NRP1, we observed marked differences between the wild-type and the mutant variant. This further confirms our previous discovery regarding the notable structural and stability alterations caused by the NRP1 mutation. The validation provided by EBV yield in RT-qPCR supports the notion that the mutation results in lower EBV levels compared to the normal NRP1.

The potential impact of a genetic variant on binding energy is discussed concerning its effect on EBV penetration, which could potentially result in an EBV-negative NPC phenotype (Fig. 3). This genetic variant represents an interesting target for further research and interventions. The current observation is consistent with a previous study that showed reduced SARS-CoV-2 entry in the presence of a mutant form of NRP1 [17].

The milder clinical manifestations and reduced metastatic tendencies observed in subject one compared to subject two could potentially be attributed to this particular variant. This aligns with previous findings: survival rates significantly decrease for patients with over 1000 copies/mL of plasma EBV DNA and those testing positive for serum EBV antibodies, as demonstrated by a 3-year survival rate in a prior study [18]. Reinforcing this, research from Indonesia indicates that a higher EBV DNA load obtained from nasopharyngeal brushings is associated with more advanced tumor stages [19]. Furthermore, patients diagnosed as EBV-positive typically exhibit more severe symptoms, faster disease progression, and a higher incidence of metastasis compared to their EBV-negative counterparts [20].

In accordance with the prevailing paradigm, it is widely accepted that mutations occurring in proteins predominantly lead to detrimental consequences. According to previous studies [21], mutations have the potential to either disrupt the normal functioning of a protein or enhance its chances of being broken down. Our research sheds light on the potential of specific protein mutations in offering protection against NPC, which goes against the commonly held belief.

This study presents innovative in silico methods that utilize structural protein measurements and molecular docking techniques to

Table 2
Quatitative Evaluation of NRP1 Blind Docking Results on both Wild-Type and Mutant Models with the EBV Envelope.

NRP1-gB			NRP1-gH/gL		
NO	Model (Wild-Type vs Mutant)	Percentage homolog	NO	Model (Wild-Type vs Mutant)	Percentage homolog
1	0 vs 2	81.81 %	1	0 vs 3	76.47 %
2	1 vs 3	73.07 %			

Table 3
Structural analysis of wild-type and mutant proteins using SWISS-MODEL.

NRP1-gB						NRP1-gH/gL					
Wild-Type			Mutan			Wild-Type			Mutan		
No	Model	Binding affinity	Model	Binding affinity	Δ Binding affinity	No	Model	Binding affinity	Model	Binding affinity	Δ Binding affinity
1	0	−1155.4	2	−1147.4	−7	1	0	−956.0	3	−894.6	−61,4
2	1	−1110.2	3	−1089.8	−20,4						

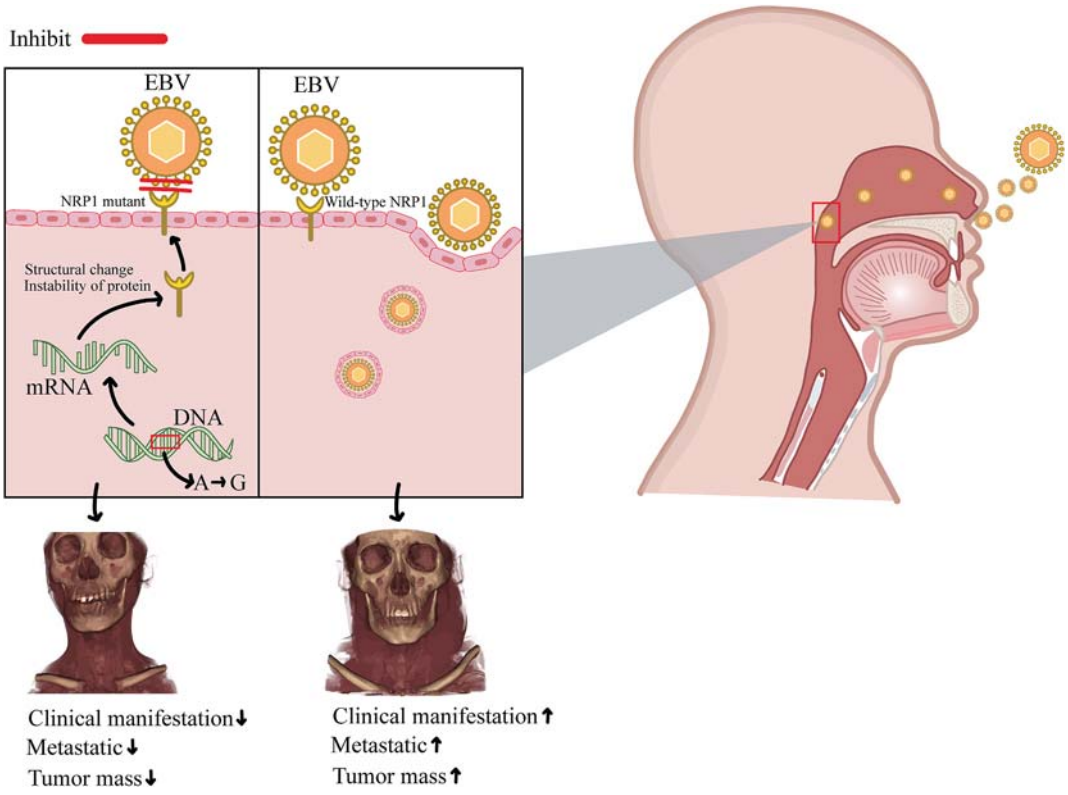


Fig. 3. Proposed Mechanism of Interaction between NRP1 (NM_003873.7:c.536T > C, p.Val179Ala) and EBV. The variant NRP1 NM_003873.7: c.536T > C results in the alteration of the A allele to the G allele, leading to a substitution of valine with alanine at position 179 (p.Val179Ala). During protein synthesis, this variant induces alterations in the structure, leading to the instability of the NRP1 protein. This modified structure enhances the energy binding between NRP1 and EBV, which could potentially inhibit the entry of EBV. As a consequence, the presence of this variant might be associated with milder clinical.

evaluate variant interpretation. Previous studies have predominantly focused on investigating splicing sites, coding regions, non-coding regions, and missense changes [22]. The study presents a significant discovery in relation to the existing guidelines. The observation is made that the current guidelines lack the ability to distinguish between risk and protective variants. The classifications of these variations range from benign to likely benign, uncertain significance, likely pathogenic, or pathogenic [22].

This study underscores the need to reassess, adapt, and develop new protocols for a deeper understanding of genetic variants. However, its findings are limited by a small sample size of only two subjects, necessitating further research with a larger cohort for validation. Enhancements in homology checks for random docking should incorporate both qualitative and quantitative measures, including variables like geometrical similarity or other relevant metrics. Future studies should investigate whether this variant is specific to younger populations, whether its protective role remains consistent in larger populations, and how this mutation affects disease outcomes when accounting for other risk factors.

5. Conclusions

A novel method was effectively utilized to shed light on the influence of genetic variations on protein structure and stability, as well as to analyze intermolecular interactions. The variant p.Val179Ala was discovered to induce structural changes, resulting in reduced

protein stability. These alterations in conformation were found to increase the binding energy between the protein and the EBV, potentially obstructing EBV entry into cells. This enhanced binding energy could offer a viable explanation for the milder clinical manifestations and reduced metastatic tendencies observed in subject one. Furthermore, these results illuminate the prospects for personalized medical strategies, such as the creation of NRP1 blockers customized to specific genetic profiles. However, additional research is necessary to validate the effects associated with this particular variant, emphasizing the importance of extending this line of inquiry across a broader population.

CRediT authorship contribution statement

Sulistyo Emantoko Dwi Putra: Writing – review & editing, Validation, Supervision, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Farizky Martriano Humardani:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Hikmawan Wahyu Sulistomo:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yulanda Antonius:** Writing – review & editing, Methodology, Investigation, Formal analysis. **Jonathan Jonathan:** Writing – review & editing, Validation, Methodology, Investigation, Formal analysis. **Riyan Charlie Milyantono:** Methodology, Investigation. **Artika Uthary:** Writing – review & editing, Methodology, Investigation. **Risma Ikawaty:** Writing – review & editing, Methodology, Investigation.

Ethical statement

Since the patients were under 18 years old, their parents provided consent for their participation in this study. Additionally, the patients themselves agreed to participate. Written informed consent was obtained from the parents for their children's participation and the publication of their clinical data, photographs, images, and videos. This study was approved by the Ethics Committee of Ibnu Sina General Hospital, Gresik, East Java, Indonesia (Approval No. 02/437.76/2023).

Data availability statement

Data available in supplementary material.

Funding

This work was supported by Indonesian Ministry of Research, Technology, and Higher Education for this study (004/SP2H/PT-L/LL7/2023, 018/SP-Lit/LPPM-01/KemendikbudRistek/FTB/V/2023).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We express our gratitude to Prodia Clinical Laboratory, Indonesia, for their valuable technical assistance. Additionally, we would like to acknowledge the support provided by Ibnu Sina Regional Public Hospital, Gresik in conducting this research.

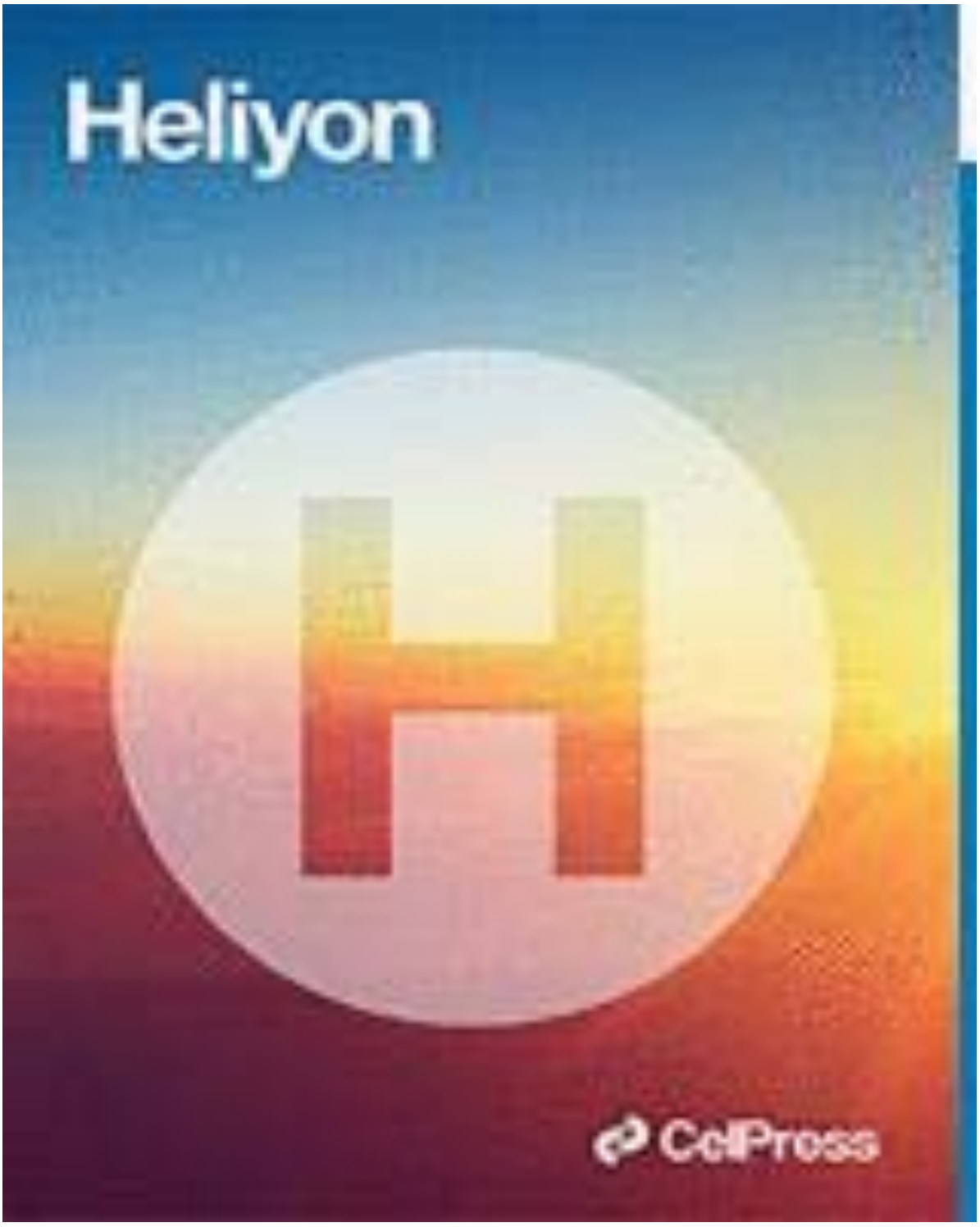
Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e41198.

References

[1] E.T. Beyene, S.G. Ketema, A.N. Alebachew, M.Y. Saleh, T.A. Gebremariam, Descriptive epidemiology of nasopharyngeal carcinoma at tikur anbessa hospital, Ethiopia, BMC Cancer 21 (2021) 540, https://doi.org/10.1186/s12885-021-08311-8.
[2] A. Reffai, M. Mesmoudi, T. Derkaoui, N. Ghailani Nourouti, A. Barakat, N. Sellal, P. Mallick, M. Bennani Mechita, Epidemiological profile and clinicopathological, therapeutic, and prognostic characteristics of nasopharyngeal carcinoma in northern Morocco, Cancer Control 28 (2021) 107327482110505, https://doi.org/10.1177/10732748211050587.
[3] A. Minhinnick, P.S. Aye, J.M. Elwood, M.J. McKeage, Cancer of the nasopharynx in Aotearoa New Zealand from 1994 to 2018: incidence and survival in a population-based, national registry cohort study, Lancet Reg. Heal. - West. Pacific. 24 (2022) 100522, https://doi.org/10.1016/j.lanwpc.2022.100522.
[4] A. Prayongrat, C. Chakkabat, D. Kannarunimit, P. Hansasuta, C. Lertbutsayanukul, Prevalence and significance of plasma Epstein-Barr Virus DNA level in nasopharyngeal carcinoma, J. Radiat. Res. 58 (2017) 509–516, https://doi.org/10.1093/jrr/rrw128.
[5] J. Chen, R. Longnecker, Epithelial cell infection by Epstein–Barr virus, FEMS Microbiol. Rev. 43 (2019) 674–683, https://doi.org/10.1093/femsre/fuz023.

[6] G. Yu, W.L. Hsu, A.E. Coghill, K.J. Yu, C.P. Wang, P.J. Lou, Z. Liu, K. Jones, A. Vogt, M. Wang, S.M. Mbulaiteye, H.H. Chen, J. Boland, M. Yeager, S.R. Diehl, C. J. Chen, A. Hildesheim, A.M. Goldstein, Whole-exome sequencing of nasopharyngeal carcinoma families reveals novel variants potentially involved in nasopharyngeal carcinoma, Sci. Rep. 9 (2019) 1–10, https://doi.org/10.1038/s41598-019-46137-4.
[7] J.A. Miller, C.H. Huang, F. Yamamoto, M.K. Sahoo, Q.T. Le, B.A. Pinsky, Comparison of real-time PCR and digital PCR for detection of plasma epstein-barr virus DNA in nasopharyngeal carcinoma, J. Mol. Diagnostics. 25 (2023) 490–501, https://doi.org/10.1016/j.jmoldx.2023.03.007.
[8] H.G.M. Niesters, J. Van Esser, E. Fries, K.C. Wolthers, J. Cornelissen, A.D.M.E. Osterhaus, Development of a real-time quantitative assay for detection of Epstein-Barr virus, J. Clin. Microbiol. 38 (2000) 712–715, https://doi.org/10.1128/jcm.38.2.712-715.2000.
[9] P. Ewels, M. Magnusson, S. Lundin, M. Käller, MultiQC: summarize analysis results for multiple tools and samples in a single report, Bioinformatics 32 (2016) 3047–3048, https://doi.org/10.1093/bioinformatics/btw354.
[10] A. Waterhouse, M. Bertoni, S. Bienert, G. Studer, G. Tauriello, R. Gumienny, F.T. Heer, T.A.P. de Beer, C. Rempfer, L. Bordoli, R. Lepore, T. Schwede, SWISS-MODEL: homology modelling of protein structures and complexes, Nucleic Acids Res. 46 (2018) W296–W303, https://doi.org/10.1093/nar/gky427.
[11] Y. Chen, H. Lu, N. Zhang, Z. Zhu, S. Wang, M. Li, PremPS: predicting the impact of missense mutations on protein stability, PLoS Comput. Biol. 16 (2020) e1008543, https://doi.org/10.1371/journal.pcbi.1008543.
[12] D. Kozakov, D.R. Hall, B. Xia, K.A. Porter, D. Padhorny, C. Yueh, D. Beglov, S. Vajda, The ClusPro web server for protein–protein docking, Nat. Protoc. 12 (2017) 255–278, https://doi.org/10.1038/nprot.2016.169.
[13] M. Tyagi, R.R. Thangudu, D. Zhang, S.H. Bryant, T. Madej, A.R. Panchenko, Homology inference of protein-protein interactions via conserved binding sites, PLoS One 7 (2012) e28896, https://doi.org/10.1371/journal.pone.0028896.
[14] L. Zanella, I. Riquelme, K. Buchegger, M. Abanto, C. Ili, P. Brebi, A reliable Epstein-Barr Virus classification based on phylogenomic and population analyses, Sci. Rep. 9 (2019) 9829, https://doi.org/10.1038/s41598-019-45986-3.
[15] K. Devkota, M. He, M.Y. Liu, Y. Li, Y.W. Zhang, Increasing Epstein-Barr virus infection in Chinese children: a single institutional based retrospective study, F1000Research 7 (2019) 1211, https://doi.org/10.12688/f1000research.15544.2.
[16] F. Pucci, K.V. Bernaerts, J.M. Kwasigroch, M. Rooman, Quantification of biases in predictions of protein stability changes upon mutations, Bioinformatics 34 (2018) 3659–3665, https://doi.org/10.1093/bioinformatics/bty348.
[17] D. Pal, K. De, T.B. Yates, J. Kolape, W. Muchero, Mutating novel interaction sites in NRP1 reduces SARS-CoV-2 spike protein internalization, iScience 26 (2023) 106274, https://doi.org/10.1016/j.isci.2023.106274.
[18] J. Zhang, X. Luo, Q. Huang, Y. Huang, Clinicopathological and prognostic features of nasopharyngeal carcinoma in children and adolescents: a retrospective study of 196 cases in South China, Int. J. Cancer 148 (2021) 1087–1096, https://doi.org/10.1002/ijc.33293.
[19] M. Adham, N.K. Jelita, D. Gatot, S.A. Gondhowiardjo, L. Rachmadi, A.E. Greijer, I.B. Tan, J.M. Middeldorp, Epstein-Barr DNA in advanced pediatric nasopharyngeal cancer, Paediatr, At. Indones. 61 (2021) 261–270, https://doi.org/10.14238/pi61.5.2021.261-70.
[20] D. Tao, N. Zhang, Q. Huang, C. Ge, Q. Li, S. Li, K. Weng, Q. Guo, J. Sui, C. Wang, X. Zhang, Y. Wang, Association of Epstein-Barr virus infection with peripheral immune parameters and clinical outcome in advanced nasopharyngeal carcinoma, Sci. Rep. 10 (2020) 21976, https://doi.org/10.1038/s41598-020-78892-0.
[21] R. Puglisi, Protein mutations and stability, a link with disease: the case study of frataxin, Biomedicines 10 (2022) 425, https://doi.org/10.3390/biomedicines10020425.
[22] S. Richards, N. Aziz, S. Bale, D. Bick, S. Das, J. Gastier-Foster, W.W. Grody, M. Hegde, E. Lyon, E. Spector, K. Voelkerding, H.L. Rehm, Standards and guidelines for the interpretation of sequence variants: a joint consensus recommendation of the American college of medical genetics and genomics and the association for molecular pathology, Genet. Med. 17 (2015) 405–424, https://doi.org/10.1038/gim.2015.30.


Heliyon
CellPress

Editors and staff

2 January 2025

Heliyon editors and staff

For biographical details about our editors and staff, please see our editors and staff page. For a detailed listing of our advisory board, please see our advisory board page.

Editorial director

Christian Schulz

Deputy editor

Pinak Chincholkar

Publisher

On Ching Lo

Editorial team leaders

Sahar Farajnia (Medical sciences)

Harry McGee (Physical and applied sciences)

Sujitha Shiney (Social sciences)

Fiona Ye (Life sciences)

Scientific editors

Leema George

Alphy Sebastian P.

Kavitha Subramanian Vignesh

Rachael Tucker

Associate scientific editors

Kruti Arjun

Spoorthy N Babu

Manasi Kulkarni

Hemalatha Thiagarajan

Elizabeth Wesner

Deputy editorial team leaders

Luca Cannatell

Katie Greenwood

Radwa Salem

Aishwarya M. Unnikrishnan

Wen Xia

Senior editorial section managers

Rebecca Campbell

Kimia Golestanian

Pradipa Mourougane

Jivitesh Newoor

Gowsika Rengaraj

Natalie Smith

Harvey Thibault

Mengpei Yan

Jie Zhang

Yating Zhang

Editorial section managers

Sisily Shiji Amaladas

Meryl Sanjna Anand

Chiranjeev Bisht

Corey Bugg

Uthara Brahadeesh

Marcus Bunduka

Charlotte Burney

Madhav Chandarana

Ruby Das

Jayachithra E

Vidya Ezhumalai

Lily Faller-Spital

David Fernández

Adlin Neefa Gleetous

Wenxin Huang

Selciba Jebastin

Helen Johnsey Rani

Roopini Karthikeyan

Difei Li

Sursha Li

Xiaoting Lyu

Jairo Martínez

Zav McDowell

Mohana Mummoorthi

Monica Pang

Mattyn Pirnazari

Hari Priya P.

Lakshmi R

Tessa Senior

Apoorva Singh

Sasikumar Somasundaram

Sylvia Sun

Niki Tahouri

Alexandra Thurston

Vigneshwari Uthayakumar

Arunkumar Vaithiyam

Yanan Wang

Zoe Wong

Nisha Yadav

Marketing manager

Victoria Howard

Project manager

Chris Russell

In-house scientific editors

A full list can be found here

Heliyon

Open access

3.4
Impact Factor

Volume 11, Issue 1

15 January 2025

Previous vol/issue | Next vol/issue

Review Article

Review article ● *Open access*

Advancements and trends in cooperative economy research — A Knowledge Map analysis based on CiteSpace and Bibliometrix

Cong Xu, Feng Wu, Yie-Ru Chiu

Article e41095

View PDF | Article preview

Abstract

Abstract

Given the rapid development and widespread application of the cooperative economy, an in-depth understanding and continuous focus on its research has become necessary. This study utilizes bibliometric analysis tools, CiteSpace and Bibliometrix, along with visualization techniques, to systematically analyze the progression and trends in cooperative economy research. Each of these tools has its unique advantages and functionalities that supplement each other in the application of bibliometric analysis, enhancing the comprehensiveness and effectiveness of the research. The aim of this study is to reveal the core themes, knowledge structure, and academic influence of cooperative economy research, providing valuable insights and references for future studies. Furthermore, this study explores the application and combination of CiteSpace and Bibliometrix in bibliometric analysis, offering a new perspective for research methodology. The findings are anticipated to contribute to the further development of cooperative economy research, providing theoretical and practical references for the sustainable development of society and economy.

Review article ● *Open access*

Tracing knowledge diffusion trajectories in the research field of cyberbullying

Abderahman Rejeb, Karim Rejeb, Imen Zrelli, Edit Süle

Article e41141

View PDF Article preview

Abstract

Abstract

In today's digital age, cyberbullying has emerged as a pervasive issue that affects individuals across various social media platforms and digital communication channels. This review explores the developmental trajectory of cyberbullying as an interdisciplinary academic field, employing a unique combination of co-word analysis and main path analysis (MPA) across a substantial body of 5183 documents. This integrated methodological approach allows for a nuanced examination of the evolution of themes and influential works within the realm of cyberbullying research. The findings highlight a complex landscape where initial focus areas, such as the behavioral and psychological triggers of cyberbullying, progressively expand towards exploring effective preventive measures and intervention strategies. Key themes identified include the impact of digital literacy, the dual role of social media as both a vector and a tool against cyberbullying, and the potential of technological advancements in detecting and mitigating cyberbullying. This comprehensive mapping and analysis deepens our understanding of cyberbullying and highlights the dynamic nature of this field, suggesting new directions for future research and practical applications to effectively address cyberbullying across various social and technological contexts. This study represents a pioneering effort in synthesizing a broad spectrum of research to offer detailed insights

Review article • *Open access*

Immunomodulatory properties of Giloy (*Tinospora cordifolia*) leaves and its applications in value-added products

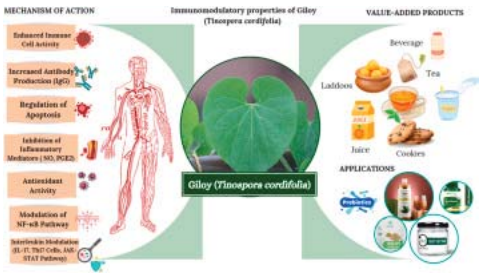
Jyoti Singh, Etika Saxena, Anjali Raj Chaudhary, Mandeep Kaur, ... Riaz Ullah

Article e40948

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article • *Open access*

Advances in electrochemical sensors for naproxen detection: Mechanisms, performance factors, and emerging challenges

Seyed Saman Nemati, Gholamreza Dehghan, Jafar Soleymani, Abolghasem Jouyban

Article e40906

View PDF Article preview

Abstract Graphical abstract

Graphical abstract

Schematic 1. Naproxen oxidized in the electrochemical cell, and electrical parameters indicate the oxidation and reduction peaks of naproxen.

Review article ● *Open access*

Development and challenges of autonomous electric vertical take-off and landing aircraft

Lijuan Hu, Xufei Yan, Ye Yuan

Article e41055

View PDF Article preview

Abstract

Abstract

Urban Air Transportation (UAT) encompasses private aircraft, air taxis, and specialized missions. These missions include aerial sightseeing, logistics transportation, emergency response, and anti-terrorism operations. They impose stringent requirements on advanced air mobility (AAM) aircraft. These requirements include efficient hovering performance, high-speed cruising capability, and compliance with strict safety and clean energy standards. Consequently, one of the core vehicles for AAM is the efficient and reliable eVTOL (electric vertical take-off and landing) aircraft. Therefore, this paper presents a review of current research on eVTOL aircraft, and highlights potential research paths to advance this innovative field. We begin by classifying and analyzing the latest eVTOL aircraft configurations currently in production, offering an overview of their applications. Subsequently, we delve into key autonomous eVTOL aircraft technologies encompassing electric propulsion, flight control method, sensing & perception, decision-making, and safety & reliability, elucidating recent progress in each domain. Furthermore, we engage in a discourse on the regulatory and societal challenges, including a discussion on airworthiness regulations, that are pertinent to the integration and operation of autonomous eVTOL aircraft. Finally, we conclude by providing future trends and recommendations of autonomous eVTOL aircraft technology,

Review article ● *Open access*

Deep learning-based object detection algorithms in medical imaging: Systematic review

Carina Albuquerque, Roberto Henriques, Mauro Castelli

Article e41137

View PDF Article preview

Abstract

Abstract

Over the past decade, Deep Learning (DL) techniques have demonstrated remarkable advancements across various domains, driving their widespread adoption. Particularly in medical image analysis, DL received greater attention for tasks like image segmentation, object detection, and classification. This paper provides an overview of DL-based object recognition in medical images, exploring recent methods and emphasizing different imaging techniques and anatomical applications. Utilizing a meticulous quantitative and qualitative analysis following PRISMA guidelines, we examined publications based on citation rates to explore into the utilization of DL-based object detectors across imaging modalities and anatomical domains. Our findings reveal a consistent rise in the utilization of DL-based object detection models, indicating unexploited potential in medical image analysis. Predominantly within Medicine and Computer Science domains, research in this area is most active in the US, China, and Japan. Notably, DL-based object detection methods have gotten significant interest across diverse medical imaging modalities and anatomical domains. These methods have been applied to a range of techniques including CR scans, pathology images, and endoscopic imaging, showcasing their adaptability. Moreover, diverse anatomical applications, particularly in digital pathology and microscopy, have been explored. The analysis

Review article ● *Open access*

Neuroprotective effects of baicalin and baicalein on the central nervous system and the underlying mechanisms

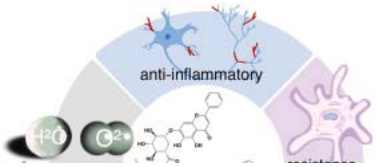
Lujia Si, Yupu An, Jiahang Zhou, Yu Lai

Article e41002

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article • *Open access*

Mechanical properties of hydraulic concretes with partial replacement of Portland cement by pozzolans obtained from agro-industrial residues: A review

Ramon Torres-Ortega, Diego Torres-Sanchez, Teresa Lopez-Lara

Article e41004

View PDF Article preview

Abstract

Abstract

The search for alternative material sources to conventional ones has had a significant impact on the construction sector today, driven by the implementation of sustainable development policies on a global scale. Alternative cementitious materials, such as agricultural industry by-products, have been introduced to ensure the efficient use of renewable natural resources while promoting a balance between the technical and economic aspects of infrastructure projects. This article provides an overview of research conducted on the use of pozzolans derived from agro-industrial by-products, such as rice husk ash (RHA), palm oil fuel ash (POFA), and sugarcane bagasse ash (SCBA), which have a high content of amorphous silica. This silica reacts with calcium hydroxide during the hydration process of Portland cement, leading to the production of calcium silicate hydrate (C-S-H) gel with cementitious properties. Investigations have explored the improvements these pozzolans provide in terms of compressive, flexural, and tensile strength in concretes where conventional Portland cement has been partially replaced by these materials. The influence of temperature and grinding processes used in their preparation was also determined, with optimal temperatures for obtaining amorphous silica ranging between 600°C and 700°C. Additionally, the optimal replacement levels for enhancing the mechanical properties of concrete were

Review article • *Open access*

Monitoring and discussion on river carbon and nitrogen fluxes in the Pearl River Estuary region

Dawei Li, Hongji Liang, Zimiao Zhao, Huifeng Huang, ... Chengzhi Wang

Article e40968

View PDF Article preview

Abstract

Abstract

Rivers link land and sea, playing an important role in the global carbon and nitrogen cycles. By conducting surveys and research on river flow in a specific region, we can gain a better understanding of the nitrogen and carbon sinks in the area and their contributions to the environment. In this study, we conducted bi-annual sampling and monitoring of river flow in the Pearl River Delta downstream of Zhuhai, China, and collected hydrological information. The results show that the total flow in the dry season (939.22 m^3/s) is lower than that in the rainy season (1556.40 m^3/s); the highest concentration of total organic carbon is in the dry season (14.70 mg/L) and the lowest is in the rainy season (10.95 mg/L); the total organic carbon emission flux is lower in the dry season (1804.45 g/s) than in the rainy season (3331.04 g/s), and the maximum emission points in both seasons are at the Damenkou Waterway, with values of 2327.60 g/s and 917.87 g/s, respectively; the highest concentration of total nitrogen is in the dry season (40.20 mg/L) and the lowest is in the rainy season (17.80 mg/L); the total nitrogen flux is lower in the dry season (2204.68 g/s) than in the rainy season (2403.47 g/s). Inorganic nitrogen is the main component of total nitrogen, and ammonium nitrogen is the main component of inorganic nitrogen. The maximum flux of total nitrogen at both sampling frequencies is in the main entrance waterway. Same as the maximum flux point

Review article • *Open access*

Potential of water sediments in construction materials: Current approaches and critical consideration of future challenges

Jan Fořt, Ayodele Afolayan, Václav Kočí, Lenka Scheinherrová, ... Robert Černý

Article e41121

View PDF Article preview

Abstract

Abstract

Human activities result in sediment accumulation, so the reservoirs gradually lose their functionality, impacting their ability to manage large flood inflows, supply water, and generate hydroelectric power. Therefore, periodic removal of sediments from water reservoirs is essential to maintain functionality. Notwithstanding, the management of dredged sediments is a multifaceted process that involves careful consideration of environmental, regulatory, and economic factors to ensure their responsibility and sustainable handling. In this regard, the search for synergies represents an important development factor in the current industrial world, which can bring several benefits, especially in the construction industry. By reusing sediments, the environmental externalities typically associated with building materials production can be reduced by transforming sediments from waste material into valuable resources. The consolidated knowledge in this review emphasizes the advances in the upcycling of dredged sediments into building materials in various ways, including aggregate production, brick manufacturing, traditional binder replacement, and alkaline activation. The provided summary of benefits, disadvantages, challenges, and future potential of freshwater dredged sediments (FDS) use can stimulate the rationalization of material flows, reduce the dependence on primary raw materials in the construction industry, and at

Review article ● *Open access*

A review on effect of nanoparticle addition on thermal behavior of natural fiber–reinforced composites

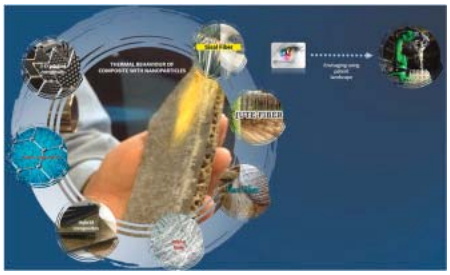
D. Balaji, P. Sathish Kumar, V. Bhuvaneshwari, L. Rajeshkumar, ... Suchart Siengchin

Article e41192

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article ● *Open access*

Review of the environmental and health risks of hydraulic fracturing fluids

Sara Makki, Elsa Maalouf, Alissar Yehya

Article e40883

View PDF Article preview

Abstract

Abstract

The composition of hydraulic fracturing (HF) fluid poses risks to human health and the environment by impacting drinking water sources. Fracturing fluid recovery rate is highly variable, and the fact that a high percentage of the injected HF fluid is not produced back to the surface in some areas raises questions about its fate and possible migration into aquifers. In this paper, the composition of the HF fluid and related toxicity are described, along with insights about the environmental impact linked with HF fluid, synthesized spill data, main factors affecting the flow-back ratio, and induced seismicity related to HF activities. The environmental and health hazards posed by HF fluid are concerning due to the high concentration of toxic chemicals, the limited data on toxicity, the high probability of spills, and the reported cases of aquifer contamination. Furthermore, low load recovery values (10%–50%) suggest that a significant volume of fracturing fluids may remain in the subsurface, thereby potentially increasing the likelihood of fluid migration towards drinking water sources under certain conditions. Hence, the fate of HF fluid is explained by establishing correlations between fluid flow (i.e., flow-back and migration to the subsurface) and different operation and formation parameters. For example, a negative correlation was detected between HF fluid recovery and shut-in period, fracture network complexity, and induced seismicity, while a

Review article ● *Open access*

Empirical and methodological foundations on the impact of climate-smart agriculture on food security studies: Review

Girma Tilahun, Amare Bantider, Desalegn Yayeh

Article e41242

View PDF Article preview

Abstract

Abstract

The progress of Ethiopia's agriculture is constrained by climate change leaving smallholder farmers vulnerable. As a panacea to the challenge, development institutions, governments, and research organizations are progressively promoting climate-smart agriculture (CSA) to maximize productivity, increase the resilience of livelihoods and farming systems (adaptation), and minimize or stop greenhouse gas emissions to the atmosphere (mitigation). This review synthesized knowledge on the prospects of CSA and climate change in addressing the adverse effects of climate change and variability by revising 99 peer-reviewed journal articles. The results depict that smallholder farmers in Sub-Saharan Africa are highly impacted due to their reliance on the rain-fed agriculture production system. From several available CSA technologies in the study area, the review found that small-scale irrigation is the dominant option promoted in addition to improved animal husbandry and other technologies. Secondly, adoption differs across farmers and there can never be a one-size-fits-all approach in promoting adoption in farming societies. Thirdly, the key to spearheading the adoption of CSA is the active involvement of all actors along the value chain from the buyers to input suppliers of agricultural commodities. Moreover, the review indicated that development partners and the government have played a crucial role as evidenced by the CSA roadmap that

Review article ● *Open access*

A review of emerging techniques for pyrethroid residue detection in agricultural commodities

Dirong Goh, Ahmad Faizal Abdull Razis, Nor Azah Yusof, Norida Mazlan, ... Choo Yee Yu

Article e41154

View PDF Article preview

Abstract

Abstract

Pyrethroid pesticides are essential for modern agriculture, helping to control pests and protect crops. However, due to growing concerns about their potential impact on human health and the environment, reliable detection methods are essential to ensure food safety. In this literature review, we explore the techniques used over the past decade to detect pyrethroid residues in agricultural products. Until now, various methods have been developed for detecting pyrethroid pesticides, ranging from conventional analytical approaches to innovative approaches. The conventional analytical approaches include gas, liquid, and supercritical fluid chromatography, micellar electrokinetic capillary chromatography, and enzyme-linked immunosorbent assay. Whereas innovative approaches refer to various optical-based and electrochemical-based sensors. For each method, we evaluate its strengths, limitations, and practical applications. Recent innovations are highlighted, focusing on sensitivity, selectivity, and practical applicability. By summarizing the current state of research, this review serves as a valuable resource for researchers and practitioners, providing insights into the evolving technology and strategy for detecting pyrethroid residue.

Review article ● *Open access*

Current antibiotics for leptospirosis: Are still effective?

Celyne Mendu, Syarifah Ab Rashid, Wan Siti Nur Atirah Wan Mohd Azemin, Noraini Philip

Article e41239

View PDF Article preview

Abstract

Abstract

Leptospirosis is a recurring zoonotic disease of global significance. Leptospirosis is curable, and antibiotics are available for its treatment. However, little is known about the effectiveness of the currently used antibiotics against different *Leptospira* species, serovars, and strains. This review aimed to give insight into the anti-leptospiral activities of the currently available antibiotics towards *Leptospira* strains and their effectiveness in treating and preventing leptospirosis. Anti-leptospiral activities from natural resources were also reviewed. The literature search was conducted using several databases. The majority of *Leptospira* strains were sensitive to the current antibiotics. Antibiotics can accelerate the defervescence and reduced the occurrence of leptospirosis cases

there is no affirmative evidence on the beneficial effects of the antibiotics compared to placebo in preventing death. Adverse reactions like Jarisch-Herxheimer reactions (JHR) in patients treated with the current antibiotics were also reported. Plants, marine actinobacteria and propolis are shown as potential sources of new anti-leptospiral compounds. Although leptospirosis can still be adequately treated with current antibiotics, continuous susceptibility testing and the development of novel antibiotics especially from natural resources are highly encouraged.

Review article ● *Open access*

Therapeutic potential of seaweeds and their biofabricated nanoparticles in treating urolithiasis: A review

Dhanya Raj C. T, Vivekanandan Palaninathan, Surabhi Kandaswamy, Vimal Kumar, Rathinam Arthur James

Article e41132

View PDF Article preview

Abstract

Abstract

Urolithiasis affects a significant portion of the global population, causing discomfort and pain. Unfortunately, effective drugs to treat this disorder are currently unavailable due to multiple mechanisms and an incomplete understanding of its causes. Consequently, drugs with multiple targets could be a safer and more effective remedy for treating urolithiasis. Moreover, the current treatment options are expensive and come with a risk of complications and stone recurrence. Therefore, an alternative treatment that can prevent stone recurrence and reduce associated symptoms is necessary. Seaweeds are a rich source of beneficial metabolites, like antioxidants, anti-inflammatory, analgesic, and enzyme-inhibitory properties. Advances in nanotechnology hold great promise for improving the therapeutic potential of these metabolites. However, the use of nanoparticles for treating urolithiasis has yet to be explored well, and only a few reports exist on the use of terrestrial plant-based nanoparticles. This review examines the therapeutic properties of seaweed bioactive compounds and their possible applications in treating urolithiasis. We propose that seaweeds could be an excellent source of essential dietary minerals and other bioactive compounds with multiple targets to treat renal calculus naturally. Additionally, the review highlights the potential of nanomedicine in treating urolithiasis, proposing seaweed-based

Review article ● *Open access*

A review on the production of nanofertilizers and its application in agriculture

Birara Melku Ayenew, Neela Satheesh, Zemenu Birhan Zegeye, Desalegn Adisu Kassie

Article e41243

View PDF Article preview

Abstract

Abstract

Due to the rapid rise in the worldwide population, the need for food is expanding constantly. To boost agricultural productivity large amounts of synthetic fertilizers are used. However, the extensive use of these synthetic fertilizers leads to various environmental and health problems. Nanotechnology (NT) offers significant improvement in the fertilizer fabrication with optimal chemical compositions, enhances nutrient usage competence, reduces environmental influence, and increased plant productivity. Nano fertilizers (NF) are nanomaterials (NM) that contrast significantly from their corresponding bulk materials. The concept of NF technology is highly innovative, utilizing physical, chemical, and biological methods for formulation. Additionally, the precise application and targeted delivery of nano-fertilizers ensures a more sustainable and accurate approach to agriculture. The purpose of this review is to provide an overview of the various types of nano fertilizers and their synthesis by different methods. In addition, applications of the NF and advantages are also given over the conventional pesticides. Information is also given on the current applications and challenges of the NF. NF are more effective and efficient than conservative fertilizers. The use of NF is expanding owing to the positive influence on nutritional superiority and stress resistance in plants.

Review article ● *Open access*

Threats of zoonotic pathogens in food chain: Current status and gaps in India

Madhuchhanda Das, Anup Kumar Ojha, Venencia Albert, Saradi Borah, ... Sarangthem Indira Devi

Article e41240

View PDF Article preview

Abstract

Abstract

Background

Public health is seriously threatened by transmission of zoonotic infection through the food chain. Factors like increasing population, deforestation, high demand for animal protein, and trade of sub-clinically infected animals are the main causes of the spread of infections from asymptomatic animals to humans. Despite several national programs like *Swatch Bharat Abhiyan* (The Clean India Mission), prevention of open defecation and water, sanitation, and hygiene (WASH), the incidence of diarrhoeal diseases remains high in India. There is an urgent need to understand the route of the spread of zoonotic infections so that related preventive action can be taken to protect the health of the people.

Objective

The purpose of this review is to overview the current threats of zoonotic food-borne infections to humans, challenges, and propose possible solutions to improve the public health system.

Review article ● *Open access*

Novel insights into mechanisms and therapeutics for presbycusis

Xiaoying Lin, Yiyuan Xu, Chunmei Fan, Guanbin Zhang

Article e41203

View PDF Article preview

Abstract

Abstract

Presbycusis, also referred to as age-related hearing loss, poses a substantial burden on both individuals and society. The hallmark of presbycusis is a progressive decrease in auditory sensitivity. Irreversible hearing loss occurs due to the limited regenerative capacity of spiral neurons and peripheral cochlear hair cells (HCs). Although hearing aids and cochlear implantations (CIs) are established approaches for alleviating symptoms of presbycusis, there are currently no preventive or curative measures available. This article provides a comprehensive discussion on the research progress pertaining to the classification, molecular mechanism, genetic susceptibility, as well as the applications and prospects of diverse therapeutic interventions of presbycusis. Building upon these discussions, promising interventions like gene therapy and stem cell (SC) therapy are proposed for their potential value in restoring cochlear function; thus aiming to pave new avenues for prevention and cure of presbycusis.

Review article ● *Open access*

Emerging trends in nano-sensors: A new frontier in food safety and quality assurance

Farhang Hameed Awlqadr, Ammar B. Altemimi, Syamand Ahmed Qadir, Tablo Azad Hama Salih, ... Mohammad Ali Hesarinejad

Article e41181

View PDF Article preview

Abstract

Abstract

The rapid evolution of nanotechnology has catalyzed significant advancements in the design and application of nano-sensors, particularly within the food industry, where ensuring safety and quality is of paramount concern. This review explores the multifaceted role of nano-sensors constructed from diverse nanomaterials in detecting foodborne pathogens and toxins, offering a comprehensive analysis of their operational principles, sensitivity, and specificity. Nano-sensors leverage unique physical and chemical properties at the nanoscale to enhance the detection of microbial contamination, actively contributing to food safety protocols. With applications ranging from real-time monitoring of pathogenic bacteria, such as Escherichia coli and Salmonella, to assessing environmental factors affecting food quality, these innovative devices demonstrate unparalleled advantages over conventional detection methods. Recent research illustrates the integration of nano-sensors with biosensing techniques, enabling multiplex analysis and rapid detection. Furthermore, the review addresses current challenges in the commercialization and regulatory landscape of nano-sensor technology, emphasizing the need for ongoing research to optimize their performance and facilitate widespread adoption in food safety systems. Overall, the incorporation of nano-sensors represents a transformative approach to

Review article ● *Open access*

A systematic review on the trend of transcriptomic study in livestock: An effort to unwind the complexity of adaptatio

change environment

Putri Kusuma Astuti, Péter Sárkány, George Wanjala, Zoltán Bagi, Szilvia Kusza

Article e41090

View PDF Article preview

Abstract

Abstract

Heat stress has been proven to cause negative effects on livestock leading to lower productivity and economic value. Understanding how heat stress manifests within an animal's body is the first step in devising a heat stress mitigation strategy; transcriptomic studies are one of the methods used. Here, using a systematic literature review methodology, we examine the recent decade of transcriptomics' application to the study of livestock adaptation. We identified 152 studies that met our criteria for using transcriptome methods to heat stress adaptation and were published within the last ten years. Our analysis demonstrates the growing popularity and application of transcriptome approaches in the investigation of the response of ruminants, pigs, and poultry livestock to heat stress. Majority of the works was done in chicken and cattle using multiple organs as the sample, with qRT-PCR as the most employed technique. It has been established that a variety of biomarkers can be used to assess animals under heat stress, such as the HSPs, ILs, and TLRs. Although transcriptomics has lately been employed extensively to uncover the mechanism of heat adaptation, this adaptive feature's complex mechanism remains unclear, leaving many knowledge gaps for investigation. A more complex studies involving more various cell types, organs, or even model organisms using multi-omics approach could be the future research direction

Review article ● *Open access*

Critical considerations and computational tools in plant genome editing

Dipnarayan Saha, Alok Kumar Panda, Subhojit Datta

Article e41135

View PDF Article preview

Abstract

Abstract

Recent advances in genome editing tools and CRISPR-Cas technologies have enabled plant genome engineering reach new heights. The current regulatory exemptions for certain categories of genome edited products, such as those derived from SDN-1 and SDN-2, which are free of any transgene, have significantly accelerated genome editing research in a number of agricultural crop plants in different countries. Although CRISPR-Cas technology is becoming increasingly popular, it is still important to carefully consider a number of factors before planning and carrying conducting CRISPR-Cas studies. To attempt genome editing in a plant, a high-quality genome sequence and a repeatable tissue culture protocol for in vitro regeneration are essential. One of the most important steps in plant genome editing is the designing of a CRISPR construct, which involves selecting the appropriate Cas protein, sgRNA sequence, and appropriate regulatory sequence to trigger expression. Computational tools and algorithms play a crucial role in construct design and gRNA selection to minimize off-target effects and also to optimize their delivery techniques. Researchers may need to select appropriate software tools capable of analyzing post-editing detection of mutation events and other DNA sequence abnormalities to identify off-target effects. To fully fulfill the potential of plant genome editing, continued advances in computational biology are

Review article ● *Open access*

Wallerian degeneration: From mechanism to disease to imaging

Ruiqi Tian, Yingying Zhou, Yuan Ren, Yisen Zhang, Wei Tang

Article e40729

View PDF Article preview

Abstract

Abstract

Wallerian degeneration (WD) was first discovered by Augustus Waller in 1850 in a transection of the glossopharyngeal and hypoglossal nerves in frogs. Initial studies suggested that the formation mechanism of WD is related to the nutrition of neuronal cell bodies to axons. However, with the wide application of transgenic mice in experiments, the latest studies have found that the mechanism of WD is related to axonal degeneration, myelin clearance and extracellular matrix. This review summarizes the discovery and research progress of WD and discusses the mechanism of WD from the perspective of molecular biology. In addition, this review combines the etiology, symptoms and imaging results of WD patients, and analyzes the clinical and imaging characteristics of WD, to provide the best perspective for future clinical research.

Review article ● *Open access*

Narrative overview of possible preventive measures for differentiated thyroid carcinomas

Maria Eduarda de Castro, Lucas Leite Cunha, Laura Sterian Ward

Article e41284

View PDF Article preview

Abstract

Abstract

There is compelling evidence that although the increased availability of sensitive imaging is the main cause of the increasing incidence of differentiated thyroid cancer, particularly the papillary type, there are other factors involved. Despite the acknowledged role of genetic and certain lifestyle factors, comprehensive studies delineating the interactions between multiple risk factors and the mechanistic pathways involved are scarce. A greater understanding of both modifiable and non-modifiable risk factors for thyroid cancer is critical to prevent and manage the disease and could provide a scientific basis for future research into more appropriate lifestyles and living environments for people at high risk. We reviewed the main endogenous factors that, although considered non-modifiable, can help identify at-risk individuals. In addition, we offer a narrative review of other putative causes and make recommendations for measures to prevent the emergence of new cases of differentiated thyroid cancer.

Review article ● *Open access*

Inducing apoptosis in acute myeloid leukemia; mechanisms and limitations

Zahra Koolivand, Farbod Bahreini, Elham Rayzan, Nima Rezaei

Article e41355

View PDF Article preview

Abstract

Abstract

Acute myeloid leukemia is the expansion of leukemic stem cells which might originate from a stem cell or a progenitor which has acquired self-renewal capacity. An aggregation of leukemic blasts in bone marrow, peripheral blood, and extramedullary tissue will result in acute myeloid leukemia. The main difficulty in treating acute myeloid leukemia is multidrug resistance, leading to treatment failure. This unfortunate phenomenon is practically elevated because of apoptosis inhibition in tumor cells.

Two general apoptotic pathways are the Bcl-2 regulated pathway (the intrinsic pathway) and the death receptor pathway. Deficiencies in each of these apoptotic pathways can cause the usual resistance mechanism in this disease. This article reviews and highlights different antiapoptotic pathways, currently-used treatments, and new findings in this field, which may lead to the development of treatment methods for acute myeloid leukemia.

Review article ● *Open access*

A review on WO_3 photocatalysis used for wastewater treatment and pesticide degradation

Yerkanat N. Kanafin, Alshyn Abduvalov, Marat Kaikanov, Stavros G. Poulopoulos, Timur Sh. Atabaev

Article e40788

View PDF Article preview

Abstract

Abstract

The rapid growth in the global population has led to increased environmental pollution and energy demands, exacerbating the issue of environmental contamination. This contamination is significantly impacted by various types of pesticides found in water sources, which pose serious health risks to humans, animals, and aquatic ecosystems. In response, extensive research into water treatment technologies has been conducted, focusing on efficient methods to remove these pollutants, with advanced oxidation processes and the utilization of tungsten trioxide (WO_3) as a photocatalyst showing promising results. This paper aims to review WO_3-based photocatalytic processes for pesticide degradation, highlighting the potential of modified WO_3 structures to improve photocatalytic efficiency and address current environmental challenges. Different WO_3 synthesis routes and methods for modification have been discussed. The synthesis of WO_3-based photocatalysts encompasses various methods that significantly affect their morphologies, sizes, structures, and thus catalytic performance, cost-effectiveness, and environmental sustainability. Techniques like hydrothermal, solvothermal, co-precipitation, sol-gel, and green synthesis and physical deposition techniques are elaborated, highlighting their unique advantages in producing nanostructures with desired physical and chemical properties. Moreover, enhancement methods

Review article ● *Open access*

Bridging the gap: From petri dish to patient - Advancements in translational drug discovery

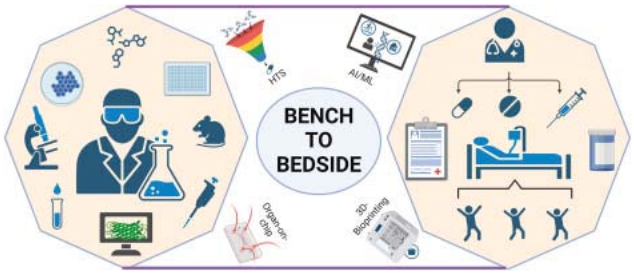
Mohamed El-Tanani, Syed Arman Rabbani, Yahia El-Tanani, Ismail I. Matalka, Ikramy A. Khalil

Article e41317

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article ● *Open access*

Global perspectives and hotspots of VEGF signaling pathway in liver disease from 2008 to 2023: A bibliometric analysis and visualization

Yi He, Jiaxin Huang, Xiaofan Liang, Chang Shao, ... Junjie Zhang

Article e41346

View PDF Article preview

Abstract

Abstract

Background

The vascular endothelial growth factor (VEGF) signaling pathway is closely related to pathological angiogenesis in liver disease. Anti-angiogenesis is an effective intervention in the clinical treatment of liver disease. Some antiangiogenic drugs are resistant and have limitations in clinical use.

Methods

This research uses bibliometric methods to assess the literature on the VEGF signaling pathway in liver disease from 2008 to 2023.

Results

The number of publications has generally increased over the past 16 years, meaning that enormous researchers are interested in this

FEEDBACK

Review article ● *Open access*

Navigating the nano-world future: Harnessing cellulose nanocrystals from green sources for sustainable innovation

Felix Sahayaraj Arockiasamy, Bharathi Manoharan, Vivek Mariappan Santhi, K. Prakalathan, ... R.A. Ilyas

Article e41188

View PDF Article preview

Abstract

Abstract

Cellulose nanocrystals (CNCs) are a class of materials that have received significant attention in recent years due to their unique properties and potential applications. CNCs are extracted from plant fibers and possess high strength, stiffness, and biocompatibility, making them attractive materials for use in various fields such as biomedical engineering, renewable energy, and nanotechnology. This provides an in-depth discussion of the extraction, characterization, and promising applications of CNCs. Furthermore, it discusses the sources of CNCs and the methods used for their extraction as well as the common techniques used to characterize their properties. This work also highlights various applications of CNCs and their advantages over other materials. The challenges associated with the use of CNCs and the current research efforts to address these challenges were analyzed. In addition, the potential future directions and applications for CNCs were discussed. This review article aims to provide a comprehensive understanding of CNCs and their potential as versatile and sustainable materials.

Review article ● *Open access*

Curing cryptoglandular anal fistulas—Is it possible without surgery?

Chuang Wu, Zubing Mei, Zhenyi Wang

Article e41297

View PDF Article preview

Abstract

Abstract

Background

Empirical reviews suggested that cryptoglandular anal fistulas require surgical resolution. However, some reports have indicated the possibility of nonsurgical and conservative treatment, which is discussed in this review.

Methods

This review explores the potential of nonsurgical approaches for curing anal fistulas through bacterial inhibition and immunomodulation. The longstanding cryptoglandular theory has been a subject of controversy, prompting the reevaluation of conventional surgical interventions for anal fistulas. The review was conducted through database searches, including Medline, EMBASE, PubMed, and the Cochrane Library.

Results

Review article ● *Open access*

Key attributes of nitrocellulose-based energetic materials and recent developments

Khoirul Solehah Abdul Rahim, Alinda Samsuri, Siti Hasnawati Jamal, Siti Aminah Mohd Nor, ... Nur Shazwani Abdul Latif

Article e41282

View PDF Article preview

Abstract

Abstract

Nitrocellulose (NC)-based propellants have played a pivotal role in the development of energetic materials for both military and civilian applications. This review offers a comprehensive exploration of NC-based propellants, tracing their evolution from their historical origins as smokeless gunpowder to modern advancements. It discusses the chemical composition and classifications of NC propellants, along with continuous efforts to refine smokeless powder formulations through studies on smoke formation, residues, and additives. Modern techniques such as PCR-based detection and dynamic light scattering have enabled precise analysis of NC properties, including variations in the degree of substitution and molar mass, which allow for tailoring the chemical structure to meet specific performance needs. Special attention is given to the combustion dynamics of NC-based propellants, with an e

reaction zones, performance characteristics, and optimization strategies that enhance their overall efficacy. The review also highlights the significant impact of nitrogen content, additives, and processing methods on the performance, stability, and safety of NC-infused propellants. While higher nitrogen content improves energetic output, it also increases surface cracking and gas production, necessitating the use of stabilizers and additives like Bu-NENA, copper compounds, and MgH_2 to enhance flexibility, thermal stability,

Review article ● *Open access*

Collaborative arts therapies as a supportive intervention for autism spectrum disorders: Bibliometric analysis, insights, and directions

Aijia Zhang, Xuexing Luo, Fangtian Ying, Jue Wang, Guanghui Huang

Article e41333

View PDF Article preview

Abstract

Abstract

Purpose

Arts therapies (ATs) for the treatment of autism spectrum disorders (ASD) has attracted widespread attention from scholars. However, resources, technical, and ethical issues still pose significant obstacles to current research. A collaborative design approach is needed to guide the intervention treatment process involving multiple stakeholders. Therefore, this study focuses on exploring the current status, development and potential value of the collaborative arts therapies (CATs), providing a comprehensive perspective for subsequent research.

Methods

The Web of Science, PubMed, ScienceDirect, and Cochrane Library were searched for publications up to August 30, 2023, related to the use of CATs for the treatment of ASD. CiteSpace was used to build a knowledge graph to achieve visual analysis of current research countries, institutions, journals, authors, and hot topics

Review article ● *Open access*

Lapsi (*Choerospondias axillaris* (Roxb.) B.L.Burtt & A.W.Hill): A review on traditional uses, chemical constituents and biological activities

Summi Rai, Sawan Kumar Rajbanshi, Jashuda Chauhan, Pooja Shah, ... Hari Prasad Devkota

Article e41146

View PDF Article preview

Abstract

Abstract

Lapsi (*Choerospondias axillaris* (Roxb.) B.L.Burtt & A.W.Hill) is an useful medicinal plant known for various bioactive compounds and diverse biological activities. The aim of this article was to comprehensively review the available information about the traditional uses, chemical constituents and biological activities of Lapsi. A comprehensive literature search was conducted using various databases, including PubMed, Scopus, Web of Science, Google Scholar, and ScienceDirect. Fruits, leaves, and bark have been extensively studied for their potential health benefits, owing to the presence of various phytochemicals such as polyphenols including flavonoids and phenolic acids, terpenoids, and essential oils. These compounds exhibited antioxidant, antimicrobial, anti-inflammatory, and anticancer properties. Additionally, the nutritional value of Lapsi fruit contributes to its popularity as a food source in traditional cuisines. In conclusion, this review explores the chemical constituents and pharmacological activities of Lapsi and highlights its importance as a multipurpose plant in various fields.

Review article ● *Open access*

Immunotherapy in colorectal cancer: Statuses and strategies

Yuan Li, Zewei Cheng, Shengli Li, Jiwei Zhang

Article e41354

View PDF Article preview

Abstract

Abstract

Colorectal cancer (CRC) is widely recognized as the third most prevalent malignancy globally and the second leading

related mortality. Traditional treatment modalities for CRC, including surgery, chemotherapy, and radiotherapy, can be utilized either individually or in combination. However, these treatments frequently result in significant side effects due to their non-specificity and cytotoxicity affecting all cells. Moreover, a considerable number of patients face relapses following these treatments. Consequently, it is imperative to explore more efficacious treatment interventions for CRC patients. Immunotherapy, an emerging frontier in oncology, represents a novel therapeutic approach that leverages the body's immune system to target cancer cells. The principal advantage of immunotherapy is its capacity to selectively target cancer cells while minimizing damage to healthy cells. Its recent adoption as a neoadjuvant therapy presents significant potential to transform the treatment landscape for both primary resectable and metastatic CRC. This review endeavors to offer a comprehensive overview of current strategies in CRC immunotherapy, critically analyze existing literature, underscore anticipated outcomes from ongoing clinical trials, and deliberate on the challenges and impediments encountered within the field of immunotherapy.

Review article • *Open access*

Bibliometric analysis of laryngeal cancer treatment literature (2003–2023)

Yan Zhao, Jiancheng Xue

Article e40832

View PDF Article preview

Abstract

Abstract

Background

Despite advancements in medical science, the 5-year survival rate for laryngeal squamous cell carcinoma remains low, posing significant challenges in clinical management. This study explores the evolution of key topics and trends in laryngeal cancer research. Bibliometric and knowledge graph analysis are utilized to assess contributions in treating this carcinoma and to forecast emerging research hotspots that may enhance future clinical outcomes. The findings aim to guide researchers by identifying new areas, providing valuable insights and innovative perspectives.

Methods

Data were extracted from the Web of Science Core Collection database on December 1, 2023. Bibliometric and knowledge mapping analyses were conducted using software tools such as R-Studio 4.1.3, CiteSpace 6.1.R6, VOSviewer 1.6.18, and http://bibliometre.com. (Both CiteSpace 6.1.R6 and VOSviewer 1.6.18 are widely used bibliometric analysis software tools, each with distinct features and

Review article • *Open access*

Review on antibacterial flavonoids from genus *Erythrina*: Structure-activity relationship and mode of action

Tati Herlina, Abd Wahid Rizaldi Akili, Vicki Nishinarizki, Ari Hardianto, Jalifah Binti Latip

Article e41395

View PDF Article preview

Abstract

Abstract

The Fabaceae family, particularly genus *Erythrina*, is renowned for significant medicinal properties. These plants have been used as natural remedies to address various health issues and are rich in flavonoids. Therefore, this review aimed to provide a comprehensive overview of antibacterial activity, structure-activity relationship, especially against drug-resistance *Staphylococcus aureus,* and mode of action for flavonoids isolated from *Erythrina*. Data were collected from reputable electronic scholarly resources focusing on publications from 2000 to 2022. The results showed that the evaluated flavonoids include 31% pterocarpans, 22% flavanones, 20% isoflavanones, 18% isoflavones, 4% isoflavans, 3% isoflav-3-enes, 1% 3-arylcoumarins, and 1% coumestans. Most of these compounds in *Erythrina* plants were extracted from the roots and stem bark. Among these group of flavonoids, pterocarpan stands out as the most active class against *S. aureus*. Structure-activity relationship study emphasized pivotal contribution of the prenyl functional group to enhance antibacterial activity of flavonoids. Increasing the number of prenyl groups enhanced antibacterial effectiveness while modifying the group reduced this activity. The proposed antibacterial mechanisms of these flavonoids include the suppression of nucleic acid synthesis, disruption of cytoplasmic membrane function, and modulation of energy metabolism. Among the potent

Review article • *Open access*

Exploring perinatal mesenchymal stromal cells as a potential therapeutic strategy for rheumatoid arthritis

Stefano Alivernini, Alice Masserdotti, Marta Magatti, Anna Cargnoni, ... Ornella Parolini

Article e41438

View PDF Article preview

Abstract

Abstract

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease characterized by inflammation in the synovial tissue, driven by aberrant activation of both the innate and adaptive immune systems, which can lead to irreversible disability. Despite the increasing therapeutic approaches for RA, only a low percentage of patients achieve sustained disease remission, and the persistence of immune dysregulation is likely responsible for disease recurrence once remission is attained. Cell therapy is an attractive, wide-spectrum strategy to modulate inflammation, and mesenchymal stromal cells (MSC) derived from perinatal tissues provide valuable tools for their use in regenerative medicine, mainly due to their immunomodulatory properties. Several *in vitro* studies have shown that perinatal MSC modulate the proliferation, maturation, and cytokine secretion profile of both innate and adaptive immune cells. Moreover, different beneficial effects have also been described when perinatal MSC were used to treat animal models of diseases associated with inflammatory conditions and degenerative processes. Specifically, in experimental models of RA, treatment with perinatal MSC resulted in a strong reduction of articular damage, which was associated with the modulation of both inflammation and activation of stromal resident cells in the synovial tissue. Here, we present *in vitro* and *in vivo* evidence supporting the use of perinatal

Review article ● *Open access*

The therapeutic potential of apigenin against atherosclerosis

Xueqiang Jiang, Huimin Huang

Article e41272

View PDF Article preview

Abstract

Abstract

Apigenin is a natural flavonoid abundantly found in fruits, vegetables, and medicinal plants. It possesses protective effects against cancer, metabolic syndrome, dyslipidemia, etc. Atherosclerosis, a chronic immune-mediated inflammatory disease, is the underlying cause of coronary heart disease, stroke, and myocardial infarction. Numerous in vivo and in vitro studies have shown a protective effect of apigenin against atherosclerosis, attributed to its antioxidant and anti-inflammatory properties, as well as its antihypertensive effect and regulation of lipid metabolism. This study aimed to review the effects and mechanisms of apigenin against atherosclerosis for the first time. Apigenin displays encouraging results, and this review confirms the potential value of apigenin as a candidate medication for atherosclerosis.

Review article ● *Open access*

Effects of Tongluo Zhitong formula on synovial fibroblast proliferation in human knee osteoarthritis

Li-Li Yang, Qing-Fu Wang, Xiao-Fang Ding, Huan Liang

Article e41392

View PDF Article preview

Abstract

Abstract

Objective

We aimed to investigate the effects of Tongluo Zhitong formula on synovial fibroblast proliferation in human knee osteoarthritis (KOA).

Methods

Discarded synovial tissue collected from patients undergoing total knee arthroplasty at our hospital was digested with type I collagenase. Primary culture was performed on three to four generations of fibroblasts, which were treated with high, medium, and low concentrations of Tongluo Zhitong formula. The KOA synoviocyte proliferation level was detected through applying the methyl-thiazol-tetrazolium (MTT) method, and cell morphology at each concentration was observed under inverted microscopy.

Results

Review article ● *Open access*

Metal-organic framework catalysed multicomponent reactions towards the synthesis of Pyrans

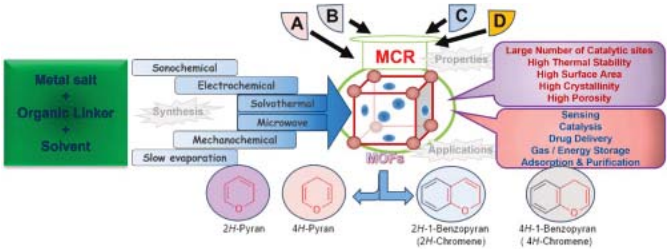
Subrahmanya Ishwar Bhat, Chinmay Bhat

Article e41439

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article ● *Open access*

Self-mentions in design area disciplines: A corpus analysis

Victor(ia) Batres-Prieto, Asad Abbas

Article e41200

View PDF Article preview

Abstract

Abstract

This study analyzes the self-mention forms represented by first-person pronouns (I, me, my, we, us, and our), self-citations, and other forms of mentions made by the same author(s) in each article (e.g., this writer, the author, the authors, the research team) in a corpus of academic articles (625,195 words) in Design area disciplines to determine the similarities and differences in self-mention practices within these disciplines and the previous findings reported in the literature of authorial self-representation observed in hard and soft fields. A quantitative approach using the method employed by Hyland in 2001 [23] explored a corpus of 100 academic empirical and theoretical articles on visual arts, design, architecture, and art and design education (25 for each discipline) obtained from Q1 and Q2 journals listed in the Visual Arts and Performing Arts subject area of Scopus. The results suggest that self-mention practices in Design area disciplines share similarities and differences with the authorial self-representation in soft and hard fields previously reported in the literature by Hyland in 2001 [23] and Dixon in 2022 [24]. Overall, self-mentions in Design area disciplines resemble the authorial self-representation practices in soft fields. However, self-mentions in architecture tend to use the impersonal writing of hard fields because this discipline has a close historical relationship with engineering. This is the first corpus analysis of self-mention practices in

Review article ● *Open access*

Research focus and theme evolution on enhanced external counterpulsation: A bibliometric analysis

Weimei Yang, Lijuan Lu, Jie Cheng, Xifei He

Article e41258

View PDF Article preview

Abstract

Abstract

Aims

The study delved into the identification of key research areas and evolving trends within the domain of Enhanced External Counterpulsation, aiming to gain comprehensive insights into the subject matter.

Methods

Utilizing the sophisticated search parameter of 'topic' (TS) on the Web of Science (WoS) database, the necessary information was retrieved. This research employed an array of tools for effective data extraction, analysis, and visualization, which incl

Excel for tabular management, HistCite Pro for citation analysis, GunnMap for geographical mapping, BibExcel for bibliometric assessments, and VOSviewer for network visualization purposes.

Review article ● *Open access*

A comprehensive review of flexible alternating current transmission system (FACTS): Topologies,applications, optimal placement, and innovative models

Mehrdad Tarafdar Hagh, Mohammad Ali Jabbary Borhany, Kamran Taghizad-Tavana, Morteza Zare Oskouei

Article e41001

View PDF Article preview

Abstract

Abstract

This paper is a comprehensive reference for researchers interested in flexible AC alternating current transmission systems (FACTS) technologies. This study investigates modified UPFC models. Besides UPFC, an overview of DPFC will be presented, and the critical differences between these advanced power flow control technologies will be discussed. In particular, we will do a comparative evaluation of three well-known DPFC models: Distributed Series Reactor (DSR), Distributed Static Series Compensator (DSSC), and Distributed Unified Power Flow Controller (DUPFC). This work also discusses the latest models of FACTS technology, such as Carbon Nanotubes (CNT), Multi-winding transformers (MWT), and Line-to-Line Compensators (LLC). Finally, this review paper introduces advanced optimization techniques for optimal placement and design of FACTS devices.

Review article ● *Open access*

Multi-functional dressings for recovery and screenable treatment of wounds: A review

F. Moradifar, N. Sepahdoost, P. Tavakoli, A. Mirzapoor

Article e41465

View PDF Article preview

Abstract

Abstract

Considerable research has focused on advanced wound dressing technology over the past decade. The increasing emphasis on health and medical treatment is crucial to the modern healthcare system. Consequently, high-quality wound dressings with advanced standards are essential for superior medical care. Next-generation multifunctional wound dressings feature antibacterial properties, pain relief, biocompatibility, drug delivery, flexibility, and exudate absorption. Today, biomimetic models, tissue engineering, and synthetic skin are integrated with emerging wound healing technologies, offering a new perspective on wound management. Based on the classification model of multifunctional and advanced wound dressings, various AI-assisted wound management technologies are also highly efficient. The primary goals of advanced wound dressing technologies include faster wound healing, prevention of microbial contamination, preservation of skin aesthetics, reduction of treatment costs, and increased patient comfort. The latest technologies in this field not only promote faster healing and the treatment of deep wounds but also emphasize continuous control and monitoring of the healing process. These screenable wound dressings can be smart sensors to detect wound status based on parameters such as pH, moisture, temperature, and oxygen levels. This enables wound status monitoring and appropriate treatment

Review article ● *Open access*

Preoperative management in octogenarian patients with rectal cancer

Arthur M. Damasceno, Rubens Kesley, Marcus Valadão, Fabrício Braga, ... Marcos B. Pitombo

Article e41469

View PDF Article preview

Abstract

Abstract

Background

In recent years, the rise in average lifespan has been linked to an increase in the occurrence of diseases associated wit

worldwide. Rectal tumors often occur in elderly patients.

Methods

Between January and August 2024, 6 experts in colorectal cancer met to develop an algorithm to organize the interdisciplinary and multimodal preoperative approaches in the octogenarian population with rectal cancer. To develop the algorithm, we conducted a straightforward search within the PubMed database and also reviewed the citations of the most pertinent articles we discovered. The quality of the methods used in the final selection of 76 sources was evaluated, every single source was scrutinized and analyzed, and a team of six experts created an algorithm.

Review article ● *Open access*

Molecular mechanisms of mTOR-mediated cisplatin response in tumor cells

Amirhosein Maharati, Yasamin Rajabloo, Meysam Moghbeli

Article e41483

View PDF Article preview

Abstract

Abstract

Cisplatin (CDDP) is one of the main chemotherapeutic drugs that is widely used in many cancers. However, CDDP resistance is a frequent therapeutic challenge that reduces prognosis in cancer patients. Since, CDDP has noticeable side effects in normal tissues and organs, it is necessary to assess the molecular mechanisms associated with CDDP resistance to improve the therapeutic methods in cancer patients. Drug efflux, detoxifying systems, DNA repair mechanisms, and drug-induced apoptosis are involved in multidrug resistance in CDDP-resistant tumor cells. Mammalian target of rapamycin (mTOR), as a serine/threonine kinase has a pivotal role in various cellular mechanisms such as autophagy, metabolism, drug efflux, and cell proliferation. Although, mTOR is mainly activated by PI3K/AKT pathway, it can also be regulated by many other signaling pathways. PI3K/Akt/mTOR axis functions as a key modulator of drug resistance and unfavorable prognosis in different cancers. Regarding, the pivotal role of mTOR in CDDP response, in the present review we discussed the molecular mechanisms that regulate mTOR mediated CDDP response in tumor cells.

Review article ● *Open access*

AI-optimized electrochemical aptasensors for stable, reproducible detection of neurodegenerative diseases, cancer, and coronavirus

Amira Elsir Tayfour Ahmed, Th.S. Dhahi, Tahani A. Attia, Fawzia Awad Elhassan Ali, ... Subash C.B. Gopinath

Article e41338

View PDF Article preview

Abstract

Abstract

AI-optimized electrochemical aptasensors are transforming diagnostic testing by offering high sensitivity, selectivity, and rapid response times. Leveraging data-driven AI techniques, these sensors provide a non-invasive, cost-effective alternative to traditional methods, with applications in detecting molecular biomarkers for neurodegenerative diseases, cancer, and coronavirus. The performance metrics outlined in the comparative table illustrate the significant advancements enabled by AI integration. Sensitivity increases from 60 to 75% in ordinary aptasensors to 85–95%, while specificity improves from 70-80% to 90–98%. This enhanced performance allows for ultra-low detection limits, such as 10 fM for carcinoembryonic antigen (CEA) and 20 fM for mucin-1 (MUC1) using Electrochemical Impedance Spectroscopy (EIS), and 1 pM for prostate-specific antigen (PSA) with Differential Pulse Voltammetry (DPV). Similarly, Square Wave Voltammetry (SWV) and potentiometric sensors have detected alpha-fetoprotein (AFP) at 5 fM and epithelial cell adhesion molecule (EpCAM) at 100 fM, respectively. AI integration also enhances reproducibility, reduces false positives and negatives (from 15-20% to 5–10%), and significantly decreases response times (from 10-15 s to 2–3 s). These advancements improve data processing speeds (from 10 to 20 min per sample to 2–5 min) and calibration accuracy (<2% margin of

Review article ● *Open access*

The role of cell cycle-related genes in the tumorigenesis of adrenal and thyroid neuroendocrine tumors

Ekaterina Filipovich, Ekaterina Gorodkova, Anastasia Shcherbakova, Walaa Asaad, ... Marina Utkina

Article e41457

View PDF Article preview

FEEDBACK

Abstract

Abstract

The molecular mechanisms underlying adrenal and thyroid neuroendocrine tumors, including their tumorigenesis, progression, and metastasis, involve unique pathways regulating cell cycle progression. To better understand these mechanisms and pathways, extensive in-depth research on cell cycle-related genes is necessary. This review aims to describe and interpret current single-cell RNA sequencing studies on neuroblastoma, medullary thyroid cancer, and pheochromocytoma tumors. Our review summarizes differentially expressed cell cycle-related genes with distinct functions, highlighting their potential as therapeutic targets and components of panels used to determine tumor type or aggressiveness. Although some insights have been gained, there is still limited information on these topics, and further research is required to explore the regulatory mechanisms of these tumors.

Review article ● *Open access*

Pharyngeal perforations after anterior cervical spinal procedures: A systematic review

Baha Eldin Adam, Osman Kılıç, Selma Bozcan, Mehmet Ali Kahraman, ... Naci Balak

Article e41466

View PDF Article preview

Abstract

Abstract

Background

Digestive system perforations after anterior cervical spine surgery (ACSS), if left untreated, are life-threatening. These injuries are often categorized as pharyngoesophageal. Although the pharynx and esophagus are continuations of each other, they are two distinct anatomical structures. There is limited experience in managing patients with pharyngeal injuries after ACSS.

Methods

Using PRISMA guidelines, a PubMed search was conducted on the iatrogenic pharyngeal perforations after ACSS for the treatment of disc herniation and degenerative cervical myeloradiculopathy.

Results

Review article ● *Open access*

The role of the extracellular matrix in cardiac regeneration

Xiying Wang, Shuo Yu, Lan Xie, Meixiang Xiang, Hong Ma

Article e41157

View PDF Article preview

Abstract

Abstract

The extracellular matrix (ECM) is a complex and dynamic three-dimensional network that functions as an architectural scaffold to maintain cardiac homeostasis. Important biochemical and mechanical signals associated with cell–cell communication are provided via the reciprocal interaction between cells and the ECM. By converting mechanical cues into biochemical signals, the ECM regulates many cell processes, including migration, adhesion, growth, differentiation, proliferation, and apoptosis. Moreover, the ECM facilitates the replacement of dead cells and preserves the structural integrity of the heart, making it essential in conditions such as myocardial infarction and other pathological states. When excessive ECM deposition or abnormal production of ECM components occurs, the heart undergoes fibrosis, leading to cardiac dysfunction and heart failure. However, emerging evidence suggests that the ECM may contribute to heart regeneration following cardiac injury. The present review offers a complete overview of the existing information and novel discoveries regarding the involvement of the ECM in heart regeneration from both mechanical and biochemical perspectives. Understanding the ECM and its involvement in mechanotransduction holds significant potential for advancing therapeutic approaches in heart repair and regeneration.

Review article ● *Open access*

Navigating the depths: A comprehensive narrative review on depression in people with epilepsy

Norah A. Alkhaldi

Article e41389

View PDF Article preview

Abstract

Abstract

Epilepsy presents a significant global health challenge, impacting millions worldwide. Alarmingly, over half of individuals living with epilepsy (PWE) also face concurrent medical conditions, with psychiatric complications, particularly depression, standing out as prevalent issues. The relationship between epilepsy and depression is complex and bidirectional, with approximately a quarter of adults with epilepsy receiving a diagnosis of depression. This complexity underscores the challenges in diagnosing depression in epilepsy patients, hindered by overlapping symptoms and distinct manifestations of depression in this population. Our review highlights that the use of most antidepressant pharmacotherapies does not increase the risk of seizure occurrences. On the contrary, compelling evidence suggests that such treatments may even decrease seizure frequency, offering hope for patients. In addition to pharmacology, non-pharmacological interventions are emerging as vital alternatives, enriching the therapeutic landscape. However, despite these promising avenues, a significant gap in our understanding persists, characterized by a lack of comprehensive, prospective research. Our review rigorously explores the latest pathophysiological insights linking depression and epilepsy while critically evaluating contemporary treatment paradigms for individuals grappling with these comorbid conditions. By focusing on the

Review article ● *Open access*

Tropical almond (*Terminalia catappa*): A holistic review

Suresh Ramanan S, A. Arunachalam, Rinku Singh, Ankit Verdiya

Article e41115

View PDF Article preview

Abstract

Abstract

Terminalia catappa L. known as tropical almond, has a global distribution. Further, it is a popular choice for avenue planting in the tropics including India. In India, more than 20 species of the genus *Terminalia* are reported and grown for its multipurpose uses. However, *T. catappa* is an untapped as well as underutilized nut-yielding tree, despite having comparable nutritive value to Almonds but with lower yield. The propagation of the tree is typically done with seeds and there is lack of documented tree breeding and improvement initiative with regard to this species. In this review, we summarize the available information on the ecological and economic utility of this tree reported across the world. There are numerous studies on this species detailing its uses as an avenue tree, medicinally important plant, small timber tree, biosorbent and other uses. The tree is also reported as a good choice for agroforestry owing to its unique features including its salinity tolerance and canopy architecture. Overall, this review concludes with details on various prospects of this tree as well as alternative for agroforestry and trees outside forests.

Review article ● *Open access*

The therapeutic potential of vitamins A, C, and D in pancreatic cancer

Alban Piotrowsky, Markus Burkard, Hendrik Schmieder, Sascha Venturelli, ... Luigi Marongiu

Article e41598

View PDF Article preview

Abstract

Abstract

The pancreatic ductal adenocarcinoma (PDAC) is among the deadliest tumor diseases worldwide. While treatment options have generally become more diverse, little progress has been made in the treatment of PDAC and the median survival time for patients with locally advanced PDAC is between 8.7 and 13.7 months despite treatment. The aim of this review was to explore the therapeutic potential of complementing standard therapy with natural or synthetic forms of vitamins A, C, and D.

The therapeutic use of vitamins A, C, and D could be a promising addition to the treatment of PDAC. For all three vitamins and their derivatives, tumor cell-specific cytotoxicity and growth inhibition against PDAC cells has been demonstrated in vitro and in preclinical animal models. While the antitumor effect of vitamin C is probably mainly due to its pro-oxidative effect in supraphysiological concentrations, vitamin A and vitamin D exert their effect by activating nuclear receptors and influencing gene transcription. In

addition, there is increasing evidence that vitamin A and vitamin D influence the tumor stroma, making the tumor tissue more accessible to other therapeutic agents

Review article ● *Open access*

Animal models in biomedical research: Relevance of *Drosophila melanogaster*

Olabisi Tajudeen Obafemi, Ademola Olabode Ayeleso, Olusola Bolaji Adewale, Jeremiah Unuofin, ... Sogolo Lucky Lebelo

Article e41605

View PDF Article preview

Abstract

Abstract

Animal models have become veritable tools in gaining insight into the pathogenesis and progression of several human diseases. These models could range in complexity from *Caenorhabditis elegans* to non-human primates. With the aid of these animal models, a lot of new knowledge has been gained about several diseases which otherwise would not have been possible. Most times, the utilization of these animal models is predicated on the level of homology they share with humans, which suggests that outcomes of studies using them could be extrapolated to humans. However, this has not always been the case. *Drosophila melanogaster* is becoming increasingly relevant as preferred model for understanding the biochemical basis of several human diseases. Apart from its relatively short lifespan, high fecundity and ease of rearing, the simplicity of its genome and lower redundancy of its genes when compared with vertebrate models, as well as availability of genetic tool kit for easy manipulation of its genome, have all contributed to its emergence as a valid animal model of human diseases. This review aimed at highlighting the contributions of selected animal models in biomedical research with a focus on the relevance of *Drosophila melanogaster* in understanding the biochemical basis of some diseases that have continued to plague mankind.

Review article ● *Open access*

Advanced photoluminescent nanomaterials for targeted bioimaging of cancer cells

Tooba Mohammadi, Hadi Gheybalizadeh, Elaheh Rahimpour, Jafar Soleymani, Vahid Shafiei-Irannejad

Article e41566

View PDF Article preview

Abstract

Abstract

The investigation of changes in the membrane of cancer cells holds great potential for biomedical applications. Malignant cells exhibit overexpression of receptors, which can be used for targeted drug delivery, therapy, and bioimaging. Targeted bioimaging is one the most accurate imaging methods with a non-invasive nature, allowing for localization of the malignant cell without disrupting cellular integrity. Also, bioimaging has the potential to enhance the quality of established imaging techniques like magnetic resonance imaging (MRI). The utilization of nanoparticles in targeted bioimaging enhances the imaging quality and efficiency. Biocompatible nanoparticles can easily penetrate cell membranes, while they can be readily functionalized on their surfaces toward cell receptors. This study reviews reports on the application of new advanced photoluminescent materials for targeted bioimaging using the cell membrane receptors. Also, the limitations and advantages of the application of nanoparticles have been reviewed along with the clinical consideration of their uses in bioimaging.

Review article ● *Open access*

Exploring peripheral fluid biomarkers for early detection of Alzheimer's disease in Down syndrome: A literature review

Charlotte Jacob, Marleen Tollenaere, Hanane Kachar, Marie-Claude Potier, ... Debby Van Dam

Article e41445

View PDF Article preview

Abstract

Abstract

People with Down Syndrome (DS) are at high risk of developing Alzheimer's disease dementia (AD) and cerebral amyloid angiopathy, which is a critical factor contributing to dementia in sporadic AD. Predicting and monitoring the decline and onset of dementia is a diagnostic challenge and of essence in daily care and support for people with DS. In this literature scoping review, we

the different blood-based biomarkers for AD in DS. Next, we describe urine-based biomarkers for AD in DS and finally, we explore various blood-based biomarkers in the general AD population. Apart from the classic amyloid beta and Tau biomarkers, we also discuss more out-of-the-box biomarkers such as neurofilament light chain, Dual-specificity tyrosine-regulated kinase 1A, and monoaminergic biomarkers. These potential biomarkers could be a valuable addition to the established panel of fluid biomarkers.

Review article ● *Open access*

Contradictory Mechanisms of rheumatoid arthritis and hepatitis B virus infection activation

Fenglin Zhu, Miao Wang, Xuhong Zhang, Guoqing Zhao, ... Lamei Zhou

Article e41444

View PDF Article preview

Abstract

Abstract

Rheumatoid arthritis (RA) is associated with a high rate of hepatitis B virus (HBV) infection. A large proportion of HBV reactivation may occur in RA patients after immunosuppression treatment, while fulminant hepatitis may occur in severe cases. Immunosuppressants are fundamental medications for the treatment of RA but carry the risk of inducing HBV reactivation. This inherent contradiction poses challenges throughout the immunosuppressive treatment process in patients with RA. Recently, numerous studies have been conducted on the contradictory therapeutic mechanisms between RA treatment and HBV infection, including aspects of innate immunity, adaptive immunity, and related signalling pathways. In this article, we review the immunological mechanisms underlying the onset of RA and HBV infections, providing a reference for determining appropriate treatment plans to reduce therapeutic contradictions and thereby reduce the risk of HBV reactivation in patients with RA combined with HBV infection.

Review article ● *Open access*

Lipidomics-based natural products for chronic kidney disease treatment

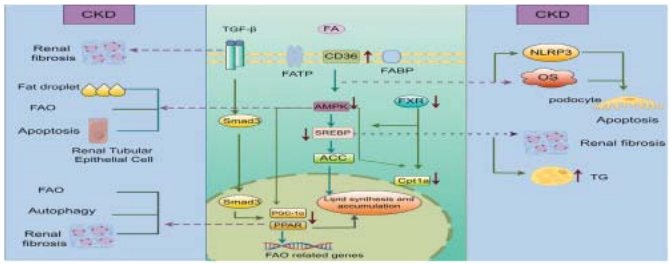
Rui Zhang, Jingjing Wang, Chenguang Wu, Lifan Wang, ... Ping Li

Article e41620

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Review article ● *Open access*

Revisiting water resources management in the Mandara Mountains

Diane Madomguia, Esther Laurentine Nya, Emma Laureane Njomou-Ngounou, Nadège Gatcha-Bandjun, ... Chicgoua Noubactep

Article e41692

View PDF Article preview

Abstract

Abstract

This article evaluates the prospects for rainwater harvesting (RWH) as a means of optimizing water management in the Mandara

Mountains. RWH is a small-scale water conservation approach for locally intercepting and storing rainfall before it enters the usual hydrologic cycle. This ancient practice has recently sustained lives in semi-arid areas of the world (e.g. Brazil, China), but is not yet really used in the Mandara Mountains of Cameroon where people are still lacking safe drinking water. Recently, RWH was also demonstrated as the missing puzzle in integrated water resources management (IWRM) not only in areas facing water scarcity. The present article aims to prepare large scale RWH in the Mandara Mountains. Water harvesting yields are estimated for residential roofs, administrative and confessional buildings, and agricultural areas (e.g. farm scale). The results show that RWH is an affordable, applicable, and attractive tool for both rural and urban communities to sustainably solve the long-lasting problem of lack of safe drinking water in the Mandara Mountains. Moreover, despite the short rainy season, RWH may provide enough irrigation water to mitigate dry spells and increase agricultural and livestock productivity. This study is regarded as a blueprint for planning sustainable

Review article ● *Open access*

New horizons in the treatment of psoriasis: Modulation of gut microbiome

Mojtaba Memariani, Hamed Memariani

Article e41672

View PDF Article preview

Abstract

Abstract

The last decennia have witnessed spectacular advances in our knowledge about the influence of the gut microbiome on the development of a wide swathe of diseases that extend beyond the digestive tract, including skin diseases like psoriasis, atopic dermatitis, acne vulgaris, rosacea, alopecia areata, and hidradenitis suppurativa. The novel concept of the gut-skin axis delves into how skin diseases and the microbiome interact through inflammatory mediators, metabolites, and the intestinal barrier. Elucidating the effects of the gut microbiome on skin health could provide new opportunities for developing innovative treatments for dermatological diseases. Psoriasis is a complex disease with multiple factors contributing to its development, such as diet, lifestyle, genetic predisposition, and the microbiome. This paper has a dual purpose. First, we outline the current knowledge on the unique gut microbiota patterns implicated in the pathogenesis of psoriasis. Second, and of equal importance, we briefly discuss the reciprocal impact of psoriasis treatment and gut microbiome. In addition, this review explores potential therapeutic targets based on microbial interventions, which hold promise for providing new treatment options for psoriasis.

Review article ● *Open access*

Parinari curatellifolia: A treasure trove of phytochemicals, nutritional benefits, and biological activities

Tafadzwa Kaseke, Trust Mukudzei Pfukwa, Kwanele Andy Nxumalo, Mawande Hugh Shinga, ... Olaniyi Amos Fawole

Article e41647

View PDF Article preview

Abstract Graphical abstract

Graphical abstract

Review article ● *Open access*

Lecturers' teaching competencies towards improving teaching and learning process in universities in Tanzania: Students' perspectives

Asia Mbwebwe Rubeba

Article e41683

View PDF Article preview

FEEDBACK

Abstract

Abstract

This study examined lecturers' teaching competencies at universities in the attempt to improve the teaching and learning process by considering students' perspectives. Specifically, the study examined indicators of lecturers' teaching competencies in universities as well as establishing whether there is a relationship between students' perceived lecturers' teaching competencies and students' demographic parameters. The study used a cross-sectional survey design to generate data from 422 undergraduate students from three public universities in Tanzania using a questionnaire. Means, standard deviations, percentages and the independent T-test were used to analyse data. Experts and peer reviews were carried out to determine the validity of the study. The study's reliability was assessed using Cronbach Alpha in which content competency=0.889, pedagogical competency=0.809, assessment and evaluation skills=0.701, and technological competency=0.777 show acceptance of theoretical constructs. From the findings, students perceived content, pedagogical, assessment and technological competencies are key indicators of lecturers' teaching competencies that improve the teaching and learning process. Based on demographic factors, there was no relationship among the four variables. These findings imply that university lecturers are required to possess and master the perceived competencies and see how best they connect these

Review article ● *Open access*

A systematic review and meta-analysis of the effectiveness of perineural dextrose injection in peripheral compression neuropathies of the upper limbs

Fatemeh Azizi, Faezeh Saber Gharesoo, Fereshteh Eidy, Sama Heidari, ... Amir Kasaeian

Article e41622

View PDF Article preview

Abstract

Abstract

Background

Entrapment neuropathies, marked by nerve compression at various anatomical sites, can be effectively managed using conservative approaches like injections. Dextrose 5% water injection has emerged as a potential therapy by reducing inflammation and promoting tissue regeneration. We aimed to evaluate dextrose injection's efficacy in treating entrapment neuropathies in upper extremities.

Method

We systematically searched EMBASE, Scopus, Web of Science, and PubMed. Our eligibility criteria included participants aged 18 and older who had peripheral upper limb nerve entrapment from non-metabolic and non-traumatic sources. These participants were treated with dextrose injection compared to those receiving other injectables, such as corticosteroids and non-corticosteroid medications. The primary outcome was pain, with secondary outcomes including function, ultrasonographic, and electrodiagnostic findings. The quality of the clinical trials was assessed using Cochrane tools. Random-effect model was employed for meta-analysis

Review article ● *Open access*

From contamination to detection: The growing threat of heavy metals

Basma Hossam Abdelmonem, Lereen T. Kamal, Rana M. Elbaz, Mohamed R. Khalifa, Anwar Abdelnaser

Article e41713

View PDF Article preview

Abstract

Abstract

Heavy metals like lead, mercury, cadmium, and arsenic are environmental pollutants that accumulate in ecosystems and pose significant health risks to humans and wildlife, primarily through food chain contamination where plants absorb heavy metals, affecting their growth and threatening consumer health. Cognitive and cardiovascular functions are particularly affected by exposure to heavy metals even at low concentrations through the induction of oxidative stress. Various analytical techniques are used in measuring heavy metals in different environmental and biological samples. The atomic absorption spectroscopy (AAS) offers low cost, simplicity, and portability but lacks sensitivity for certain metals. Although more sensitive, the high cost of inductively coupled plasma mass spectrometry (ICP-MS) may limit laboratory accessibility. The inductively coupled plasma with atomic emission spectrometry (ICP-AES) is known for its broad dynamic linear range and ability to identify minute variations in concentration. Atomic fluorescence spectrometry (AFS) is considered a powerful tool for quantifying heavy metals due to its high sensitivity, low detection limits, and wide linear range. The current article reviews heavy metal pollution's impact on health and spectrometric techniques for the detection of these contaminants. This may help efforts of international, and regional policies towards preventing this health hazard problem.

Review article ● *Open access*

Computational epitope-based vaccine design with bioinformatics approach; a review

Esmaeil Roohparvar Basmenj, Susan Radman Pajhouh, Afsane Ebrahimi Fallah, Rafe naijian, ... Shamim Ghiabi

Article e41714

View PDF Article preview

Abstract Graphical abstract

Graphical abstract

Review article ● *Open access*

Novel methods for the detection of glutathione by surface-enhanced Raman scattering: A perspective review

Mohammad Kamal Hossain, Genin Gary Huang, Mohammad Mozahar Hossain

Article e41588

View PDF Article preview

Abstract

Abstract

Detection of biomolecules, Glutathione (GSH) in particular, is important because it helps assess antioxidant capacity, cellular protection, detoxification processes, and potential disease associations. Monitoring glutathione levels can provide valuable information about overall health and well-being. Many medical disorders have been connected to glutathione levels. Higher glutathione levels have been seen in several cancer cell types, which may increase their resistance to radiation and chemotherapy. Glutathione levels can be measured through various methods, such as colorimetric assays and fluorescent probes. However, surface-enhanced Raman scattering (SERS) has been known as an efficient and selective technique for biomolecule detection. Here in this perspective review, we have reported two distinctive methods based on SERS technique in detection of GSH; heat-induced method and reversed reporting agent method. Several variables that can impact the detection scheme were elaborated in the "heat-induced method," including pretreatment, nanoparticle reduction time, the process temperature, the pH of the colloidal solution, the concentration of citrate buffer, and the concentration of participating nanoparticles. To choose the best reporting agent for a reverse reporting scheme using SERS approaches, several reporting agents were examined in the second method. In order to grasp the

Review article ● *Open access*

Personalized statin therapy: Targeting metabolic processes to modulate the therapeutic and adverse effects of statins

Zhuangqi Shi, Shuxin Han

Article e41629

View PDF Article preview

Abstract

Abstract

Statins are widely used for treating lipid disorders and cardiovascular diseases. However, the therapeutic efficiency and adverse effects of statins vary among different patients, which numerous clinical and epidemiological studies have attributed to genetic polymorphisms in statin-metabolizing enzymes and transport proteins. The metabolic processes of statins are relatively complex, involving spontaneous or enzyme-catalyzed interconversion between more toxic lactone metabolites and active acid forms in the liver and bloodstream, influenced by multiple factors, including the expression levels of many metabolic enzymes and transporters. Addressing the variable statin therapeutic outcomes is a pressing clinical challenge. Transcription factors and epigenetic modifications regulate the metabolic enzymes and transporters involved in statin metabolism and disposition and, therefore, hold promise as 'personalized' targets for achieving optimized statin therapy. In this review, we explore the potential for customizing therapy by targeting the metabolism of statin medications. The biochemical bases of adverse reactions to statin drugs and their correlation with polymorphisms in metabolic enzymes and transporters are summarized. Next, we mainly focus on the regulatory roles of transcription factors and epigenetic modifications in regulating the gene expression of statin biochemical machinery. The

Review article ● *Open access*

Examining Ethiopia's live animal and meat value chain

Asrat Ayza Wakaso, Yesihak Yusuf Mummed, Yonatan Kassu Yesuf

Article e41752

View PDF Article preview

Abstract

Abstract

This review examines the efficiency of live animal and meat value chain from producers to consumers in Ethiopia. Ethiopia has a large livestock population, but the marketing system for live animals and meat remains underdeveloped. Several challenges hinder efficient transactions, including poor infrastructure, illegal cross-border trade, lack of market information, traditional production methods, and absence of grading systems. As a result, producers often receive low prices and have limited access to export markets. The key actors in the value chain, are input suppliers, farmers, traders, cooperatives, exporters, abattoirs, and consumers. However weak linkages and lack of coordination among these actors lead to inefficiencies. The trends in Ethiopia's livestock exports have fluctuated, with live animal exports exceeding meat product exports due to supply constraints and inability to meet quality standards for processed meat. The review highlights opportunities to strengthen the value chain through infrastructure upgrades, improved market information systems, promoting quality standards, and aligning production with export requirements. Coordinated efforts involving the government, private sector, and development partners are needed to address the challenges and unlock the potential of Ethiopia's meat animal value chain for the benefit of producers, traders, consumers, and the overall economy.

Research Article

Research article ● *Open access*

Impact of extraction methods on the properties of Carica papaya pseudostem fibers from Cameroon used as reinforcement in biocomposites

Jean Aimé Mono, Sandrine Emvoutou Ndongo, Odette Thérèse Adegono Assiene, Armel Mewoli, ... Claude Takoumbe

Article e41093

View PDF Article preview

Abstract

Abstract

Carica papaya pseudostems are widely available as biomass waste in Cameroon. These agricultural wastes can be effectively used as

natural fibers in the manufacture of biocomposites. In this study, Carica papaya fibers were extracted from papaya pseudostems by retting with water and an alkaline sodium hydroxide (NaOH) solution at different concentrations (2.5%, 5%, and 7.5%). An experimental campaign is being conducted on the physical, chemical, thermal, mechanical, and morphological characteristics of Carica papaya fibers. Fourier transform infrared spectroscopy (FTIR) of Carica papaya fibers extracted by water retting and those extracted with NaOH indicates that the cellulose, hemicellulose, and lignin functional groups are present in the fibers and are dissolved considerably as the percentage of NaOH increases. Scanning electron microscopy (SEM) in the longitudinal plane gives a visual representation of the rough and irregular surfaces without the presence of impurities on the chemically extracted fibers compared to that extracted with water. In contrast to the decrease in diameter, the measured density of Carica papaya pseudostem fibers increased with NaOH concentration (0.633 –

Research article ● *Open access*

Caffeine supplement, inflammation, and hepatic function in cirrhotic patients: A randomized, placebo- controlled, clinical trial

Seyed Ali Abbas-Hashemi, Zahra Yari, Behzad Hatami, Amir Anushiravani, ... Azita Hekmatdoost

Article e41138

View PDF Article preview

Abstract

Abstract

Aim

We investigated the possibility of caffeine supplementation for managing the inflammation, and hepatic function in cirrhotic patients.

Methods

In this randomized, double-blind, placebo-controlled trial, fifty patients with cirrhosis were randomly assigned to receive either caffeine supplement (400mg), or placebo for eight weeks.

Results

The results indicated a significant decrease in AST, platelets (P=0.002), and PTT (P<0.001), in the caffeine group compared to the placebo group. Also, caffeine supplementation resulted in a significant reduction in inflammatory biomarkers compared to placebo

Research article ● *Open access*

The predictors of sleep quality in mothers of children with autism spectrum disorders in the west of Iran: A path analysis

Ensiyeh Jenabi, Azam Maleki, Erfan Ayubi, Saeid Bashirian, ... Sara Abdoli

Article e41136

View PDF Article preview

Abstract

Abstract

There is limited data available on the impact of sleep problems in children with ASD on parents' sleep quality. Due to the lack of research in Iran on factors affecting the sleep quality of mothers of children with ASD, this study was designed to explore predictors of mothers' sleep quality using path analysis. From October 2022 to May 2023, a cross-sectional study was conducted in Hamadan, a city in western Iran, involving 100 mothers of children with ASD. Data were collected using a demographic checklist and four questionnaires were included Perceived social support, Petersburg Sleep Quality Questionnaire (PSQI), Children's Sleep Habits Questionnaire (CSHQ), and Perceived Stress. Data analysis was performed using SPSS Version 16, and path analysis was conducted with LISREL software version 8.5. Statistical significance was determined by P-values less than 0.05. The sleep quality of mothers had no significant relationship with any of the demographic variables (p>0.05). Correlation bivariate analysis showed that the total score of Sleep Quality of mothers had a positive significant correlation with Perceived Stress (r=0.28) and Sleep Habit of Children (r=0.51) but had a negative significant correlation with Social Support (r=−0.31). Children's sleep habits, perceived stress, and perceived social support are the main predictors of Sleep Quality in Mothers of children with autism spectrum disorders. Our study showed sleep

Research article ● *Open access*

Effects of Earthworm (*Pheretima communisima*) extract on atopic dermatitis: An in vitro and in vivo study

Yoon-Young Sung, Heung-Joo Yuk, Seung-Hyung Kim, Dong-Seon Kim

Article e41140

View PDF Article preview

Abstract

Abstract

Earthworm (*Pheretima communisima*) is used as a traditional medicine for the management of allergic airway inflammation. Atopic dermatitis (AD) is a persistent, recurrent disorder marked by allergic inflammation and skin barrier dysfunction. However, the pharmaceutical effects of earthworms on AD have not been defined. Our study examined the anti-allergic and anti-inflammatory actions of earthworm ethanolic extract (EWE) on allergic skin inflammation in a *Dermatophagoides farinae* mite antigen-induced AD mice model, TNF-α/IFN-γ-treated human keratinocytes, and compound 48/80-treated mouse mast cells. Oral administration of EWE in AD mouse reduced inflammatory cell accumulation, epidermal hyperplasia, and dermatitis severity in AD skin lesions and thymic stromal lymphopoietin (TSLP) and immunoglobulin (Ig) E concentrations in serum. EWE administration in AD mice also reduced secretion of Interleukin (IL)-4, IL-13, IL-5, and IFN-γ in cultures of isolated splenic cells. Immunohistofluorescence staining of skin lesions from AD mice revealed that EWE induced expression of claudin-1, filaggrin, and SIRT1. In HaCaT keratinocytes cotreated with IFN-γ and TNF-α, EWE inhibited secretion of the chemokine Regulated on Activation, Normal T Cell Expressed and Secreted (RANTES) in a dose-dependent manner. In addition, EWE inhibited histamine release in activated MC/9 mast cells. These results show that EWE

Research article ● *Open access*

Integrating agent-based models and clustering methods for improving image segmentation

Erik Cuevas, Sonia Jazmín García-De-Lira, Cesar Rodolfo Ascencio-Piña, Marco Pérez-Cisneros, Sabrina Vega

Article e40698

View PDF Article preview

Abstract

Abstract

Image segmentation through clustering is a widely used technique in computer vision that partitions an image into multiple segments by grouping pixels based on feature similarity. Although effective for certain applications, this approach often struggles with the complexity of real-world images, where noise and random variations can significantly affect feature homogeneity, leading to incorrect pixel classifications. To address these limitations, this paper introduces a novel hybrid image segmentation method that combines an agent-based model with a clustering technique to enhance segmentation accuracy and robustness. The method starts with an agent-based model as a preprocessing step aimed at homogenizing pixel intensities within each region. In this model, pixels adjust their intensities based on a consensus reached within their neighborhood, promoting a more uniform feature distribution. Subsequently, the Firefly metaheuristic clustering method is applied to segment the preprocessed image into distinct regions. Metaheuristic techniques, distinguished from classical clustering methods, possess the capability to adaptively navigate through a broad solution space to discover optimal clustering configurations. This adaptability makes them suitable for complex image datasets. The efficacy of the proposed hybrid segmentation method has been tested on various images, employing key quality indices for evaluation.

Research article ● *Open access*

Amikacin-loaded selenium nanoparticles improved antibacterial and antibiofilm activity of amikacin against bovine mastitis-causing *Staphylococcus aureus*

Leila Asadpour, Maryam Alsadat Mehrbakhsh Bandari, Roozbeh Sojoudi Masouleh

Article e41103

View PDF Article preview

Abstract

Abstract

Background

Antibiotic resistance in various microorganisms has become one of the most serious health problems worldwide. The use of nanoparticles in combination with conventional antibiotics is one of the recent efforts to overcome these challenges. This study aims to synthesize and evaluate the possibility of using amikacin-loaded selenium nanoparticles as antibacterial agent against multidrug-resistant *Staphylococcus aureus*, that causes bovine mastitis.

Methods

Selenium nanoparticles (SeNPs) were synthesized through chemical reduction of sodium selenite using L-cysteine. Loading of amikacin on selenium nanoparticles was done by mixing both in solution and confirmed by UV–Vis spectroscopy, XR

Antibacterial properties of obtained nanoparticles against *S. aureus* were determined using agar disc diffusion, broth micro dilution methods and also time-kill assay. Anti-biofilm properties of amikacin-loaded selenium nanoparticles was determined using

Research article • *Open access*

Adsorption characteristics of cadmium onto calcite and its agricultural environmental relevance

Hyun Ho Lee

Article e40241

View PDF Article preview

Abstract

Abstract

Calcite ($CaCO_3$), a common component of calcium-based fertilizers, has been recognized for its effectiveness as a cadmium (Cd) immobilization agent in the solidification/stabilization (S/S) method. This strategy is a widely used chemical remediation technique aimed at reducing the bioavailability and toxicity of Cd in contaminated soils. This study comprehensively evaluated the potential of calcite for Cd remediation through geochemical analyses, including adsorption isotherms, saturation index, ion concentration changes, and X-ray diffraction (XRD) analysis. Adsorption isotherm experiments indicated that Cd adsorption onto calcite aligns more closely with the Freundlich isotherm model, suggesting a heterogeneous surface with a maximum adsorption capacity of 1.56 $mg g^{-1}$. Based on chemical states result, optimal conditions for $CdCO_3$ precipitation with low Cd concentrations were identified at pH above 7.9. XRD analysis confirmed the formation of $Ca_{0.67}Cd_{0.33}CO_3$ at higher Cd concentrations, indicating that chemisorption is the dominant immobilization mechanism. Additionally, variations in Ca^{2+} and CO_3^{2-} concentrations supported the substitution of Cd for Ca on the calcite surface. These findings highlight calcite's potential as an effective material for Cd immobilization, providing valuable insights for the developing more sustainable soil remediation strategies.

Research article • *Open access*

Risk of depression in glaucoma patients with vision impairment: A nationwide cohort study

Sheng-Min Wang, Younhea Jung, Kyungdo Han, Kyoung Ohn, ... Jung Il Moon

Article e40617

View PDF Article preview

Abstract

Abstract

Purpose

We aimed to investigate the risk of developing depression in individuals with primary open-angle glaucoma with associated vision impairment.

Methods

We conducted a nationwide, population-based cohort study using data from the Korean National Health Information Database and National Disability Registry. We assessed baseline characteristics such as age, sex, income level, lifestyle factors, anthropometric data, lab results, and Charlson Comorbidity Index scores through diagnostic codes and health screening data. Depression risk in relation to glaucoma and vision impairment was analyzed using a multivariable-adjusted Cox proportional hazard model.

Results

Research article • *Open access*

Phase change materials for thermal energy storage in industrial applications

Franklin R. Martínez, Emiliano Borri, Saranprabhu Mani Kala, Svetlana Ushak, Luisa F. Cabeza

Article e41025

View PDF Article preview

Abstract

Abstract

This study reports the results of the screening process done to identify viable phase change materials (PCMs) to be integrated in applications in two different temperature ranges: 60–80 °C for mid-temperature applications and 150–250 °C for high

applications. The comprehensive review involved an extensive analysis of scientific literature and commercial material datasheets. A total of 65 PCMs for mid-temperature applications and 36 PCMs for high-temperature applications were identified through this extensive search. Moreover, an extensive experimental characterization of 14 preselected PCMs is included. Experimental techniques including differential scanning calorimetry (DSC), thermogravimetric analysis (TGA) and hot disk were used. The values obtained were compared to the ones found in the available literature and technical datasheets to see potential differences in the thermal behavior.

Research article ● *Open access*

Impact of medical resources in residential area on unmet healthcare needs: Findings from a multi-level analysis of Korean nationwide data

Seo Yeong Choi, Il Yun, Jong Youn Moon

Article e40935

View PDF Article preview

Abstract

Abstract

Purpose

This study aimed to examine whether sufficient medical resources in residential areas influence individuals' unmet healthcare needs in South Korea, where overpopulation is of concern.

Methods

Two publicly available datasets were utilized: The Korean Community Health Survey at the individual-level and the Korean medical utilization statistics at the regional-level. It included 176,378 individuals. To address the clustered nature of the regional-level data, a multi-level framework was applied, containing individual-level data, incorporating demographic details and health information.

Results

Research article ● *Open access*

Biochemical recurrence prediction after robot-assited radical prostatectomy (BCR-PRARP)

Tanan Bejrananda, Kiyoshi Takahara, Dutsadee Sowanthip, Tomonari Motonaga, ... Ryoichi Shiroki

Article e41031

View PDF Article preview

Abstract

Abstract

Objective

This study aimed to establish a robust predictive model for biochemical recurrence (BCR) in patients with prostate cancer who underwent robot-Assisted Radical Prostatectomy.

Material and methods

A cohort of 1700 patients who underwent robot-assisted radical prostatectomy (RARP) for prostate cancer between August 2009 and December 2022 was included. BCR was defined as two consecutive PSA levels exceeding 0.2 ng/mL post-radical prostatectomy. Cox proportional hazards regression identified predictive variables for BCR. Subsequently, pathologic T stage, PSA level, positive surgical margin, extraprostatic extension, and seminal vesicle involvement were retained. A nomogram was constructed using R software to predict BCR. The model was evaluated using the C-index and calibration curves.

Research article ● *Open access*

Identification of lethality-related m7G methylation modification patterns and the regulatory features of immune microenvironment in sepsis

Dan Wang, Rujie Huo, Lu Ye

Article e40870

View PDF Article preview

Abstract

Abstract

Objectives

N7-methylguanosine (m7G) modification is closely related to the occurrence of human diseases, but its roles in sepsis remain unclear. This study aimed to explore the patterns of lethality-related m7G regulatory factor-mediated RNA methylation modification and immune microenvironment regulatory features in sepsis.

Methods

Three sepsis-related datasets (E-MTAB-4421 and E-MTAB-4451 as training sets and GSE185263 as a validation set) were collected, and differentially expressed m7G-related genes were analyzed between survivors and non-survivors. Lethality-related m7G signature genes were then screened using machine learning methods, followed by the construction of a survival recognition model. Additionally, differences in immune cell distribution were determined and differentially expressed genes (DEGs) between different subtypes were analyzed. Weighted gene co-expression network analysis (WGCNA) was used to select important modules and related hub genes

Research article ● *Open access*

Design and evaluation of two proposed hybrid FCC-BCC lattice structures for enhanced mechanical performance

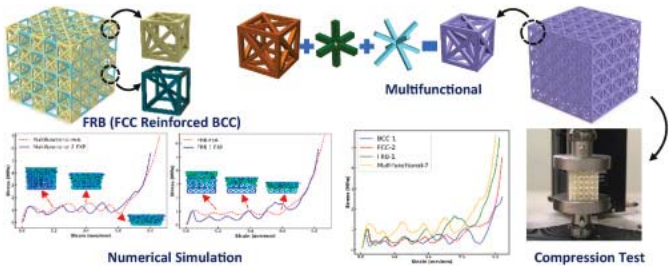
Shayan Rahimi, Mohsen Asghari

Article e40911

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Research article ● *Open access*

On the existence of solutions to fractional differential equations involving Caputo *q*-derivative in Banach spaces

Isra Al-Shbeil, Houari Bouzid, Benali Abdelkader, Alina Alp Lupas, ... Reem K. Alhefthi

Article e40876

View PDF Article preview

Abstract

Abstract

The generalization of BVPs always covers a wide range of equations. Our choice in this research is the generalization of Caputo-type fractional discrete differential equations that include two or more fractional *q*-integrals. We analyze the existence and uniqueness of solutions to the multi-point nonlinear BVPs base on fixed point theory, including fixed point theorem of Banach, Leray-nonlinear Schauder's alternative, and Leray-degree Schauder's theory. Finally, several examples are presented to demonstrate accuracy of our results.

Research article ● *Open access*

Development of a photoacoustic acquisition system and their proof-of-concept for hemoglobin detection

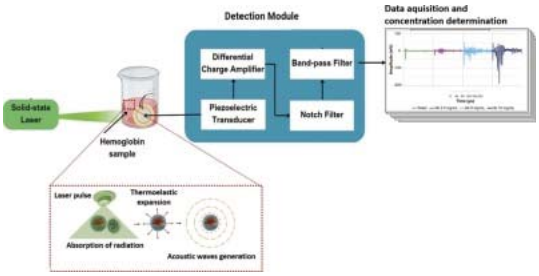
Bruna Pinheiro, Vânia Pinto, Hugo Dinis, Michael Belsley, ... Paulo Sousa

Article e41083

View PDF Article preview

Abstract | Graphical abstract

Graphical abstract



Research article ● *Open access*

"Harnessing the power of soil microbes: Their dual impact in integrated nutrient management and mediating climate stress for sustainable rice crop production" A systematic review

Said H. Marzouk, Damiano R. Kwaslema, Mohd M. Omar, Said H. Mohamed

Article e41158

View PDF Article preview

Abstract

Abstract

Sustainable agricultural practices are essential to meet food demands for the increased population while minimizing the environmental impact. Considering rice as staple food for most of the world's population, it requires innovative approaches to ensure sustainable production. In this paper, we create a hypothesis that integrated nutrient management (INM) acts as a source of energy for microbes and improves the physical, chemical and biological properties of soils, but the current understanding of how soil microbiomes interact in integrated nutrient management toward mediating climate stress to support sustainable rice crop production is limited. Hence, we develop literature search through Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) to explore the hidden knowledge related to that question. The outcomes of the study are postulated as a viable option to minimize excessive chemical fertilizers and promote organic-based nutrient management that directly impacts microbial consortia. This review uncovered that plant-microbe interactions and nutrient transformation depend heavily on soil microbes while the abundance, diversity, and activity of soil microbiome is enhanced more with integrated nutrient management than with sole synthetic fertilizers. Through their ability to enhance nutrient availability and uptake, improve soil structure, heavy metal detoxification, salinity and

Research article ● *Open access*

Drying kinetic models, thermodynamics, physicochemical qualities, and bioactive compounds of avocado (*Persea americana* Mill. Hass variety) seeds dried using various drying methods

Desta Dugassa Fufa, Tilahun Bekele, Aynadis Tamene, Geremew Bultosa

Article e41058

View PDF Article preview

Abstract

Abstract

Avocados are among the most well-known nutrient-rich fruits worldwide. However, there is a high production of by-product waste, mainly avocado seeds. Avocado seeds can be used in many functional food and non-food applications, due to their nutritional and health-promoting properties. However, preservation technologies such as drying are essential to increase shelf life and preserve bioactive compounds. It has been anticipated that pre-drying techniques could improve the quality of dried products. This study investigates the drying kinetics of avocado seed slices that have been subjected to different pre-treatments (ascorbic acid, blanching, roasting) and drying methods (fluidized bed dryer, hot air dryer, and solar dryer) using freeze-dried samples as a control. In addition, the interaction effect of pretreatment and drying methods on the thermodynamic properties, physicochemical quality, and bioactive compounds of dried avocado seeds were also evaluated. Results indicate that the logarithmic model provides the best fit for the experimental data on drying kinetics. Thermal profile coefficients for avocado seeds activation energy and effective moisture diffusivity were predicted to range from 80.91 to 97.02 $kJmol^{-1}$, and 4.8 to 5.8×10^{-10} m^2s^{-1}, respectively. Moreover, the study showed that the sample treated with roasting and dried using hot air drying (HAD) achieved the maximum desirability value of 0.9256 for

Research article ● *Open access*

Hydration in young water polo players: A bioelectrical impedance vector analysis (BIVA) approach

Sofia Serafini, Andrea Di Blasio, Iris Prestanti, Andrea Di Credico, ... Pascal Izzicupo

Article e41168

View PDF Article preview

Abstract

Abstract

Purpose

This study aimed to assess hydration status before and after training using the bioelectrical impedance vector analysis (BIVA) method.

Design

Pre-post quasi-experimental designs.

Method

Twenty-four young water polo players (mean age: 13.30±0.55) underwent assessment for bioelectrical and anthropometric measurements before and after a water polo training session.

Results

Research article ● *Open access*

A Cameroon Western Regions high-fat diet (MACAPOS 2) induces visceral obesity in rat

Sandrine Nkoubat Tchoundjwen, Armel Georges Kamgang Tchawou, Clémence Mvongo, Adamou Mfopa, ... Jean Louis Essame Oyono

Article e41011

View PDF Article preview

Abstract

Abstract

The prevalence of obesity increases yearly in the world. The traditional local diet of the Western Regions of Cameroon was suspected to be the main contributor to the high prevalence of obesity in these Regions. This study aimed to evaluate the effects of a Cameroon-comparable fat diet on visceral obesity in rats.

Two groups of male *Wistar* rats were fed for four months with respectively a normal diet (ND) (3400 kcal/kg of food) and a high-fat diet (HFD) containing maize, cassava, palm oil, and sugar (MACAPOS 2): 35% carbohydrate, 55% fat and 10% proteins (4730 kcal/kg of food). Lee index, body weight, food intake, blood and hepatic lipids, body fat, insulin resistance, glucose tolerance, glycemia, serum insulin, leptin, and adiponectin were evaluated.

HFD significantly ($P<0.01$) increased body weight and decreased food intake. After four months of diet, 88.8% of HFD rats were obese (Lee index >30 g/cm), and HFD significantly increased visceral and subcutaneous fats compared to ND. HFD increased triglyceride, total cholesterol, Low-density lipoprotein-cholesterol levels, and the atherogenic index, while the high-density lipoprotein-cholesterol level

Research article ● *Open access*

Nitrogen, phosphorus, and potassium requirements to improve *Sideritis cypria* growth, nutrient and water use efficiency in hydroponic cultivation

Antonios Chrysargyris, Nikolaos Tzortzakis

Article e40755

View PDF Article preview

Abstract

Abstract

Medicinal and aromatic plant (MAP) production is gaining popularity for industrial agriculture, with phytochemical compounds having a significant impact on human health. Plant fertilization must be carefully considered as it is strongly affecting the biochemical profile of MAPs. The present study examined the *Sideritis cypria* responses to different nitrogen (N: 75, 150, and 300 mg/L), potassium (K: 150, 350, and 550 mg/L), and phosphorus (P: 50, 75, and 100 mg/L) concentration in the nutrient solution (NS) in hydroponics. The

NPK levels (150 mgN/L; 75 mgP/L and 350 mgK/L) in the NS, which was regarded an intermediate fertilization scheme, showed a rise in nutritional value with high phenols, flavonoids and antioxidant activity in plants. *S. cypria* grown in N75 levels revealed a decreased plant fresh weight and chlorophylls content while plants grown in N300 levels revealed increases in mineral accumulation, nutrient and water use efficiency. The NPK and the K550 levels caused oxidative stress as demonstrated by the raised lipid peroxidation and the stimulation of enzymes' antioxidant activities. The P50 levels in the NS, increased the plant biomass and water use efficiency (WUE) and revealed the lower oxidative stress (malondialdehyde) and increased enzymes antioxidant (superoxide dismutase and

Research article ● *Open access*

Postpartum depression and associated factors among childbearing women from the recent Demographic and Health Survey data of Mozambique: Multilevel analysis

Mamaru Melkam, Bezawit Melak Fente, Yohannes Mekuria Negussie, Zufan Alamrie Asmare, ... Angwach Abrham Asnake

Article e41106

View PDF Article preview

Abstract

Abstract

Introduction

Postpartum depression is a non-psychotic depressive illness that affects women who have recently given birth. Symptoms of the illness include thoughts of suicide, low self-worth, guilt about not being able to care for their newborn, blaming themselves thoughts, and nervousness. Despite there being many studies conducted at the hospital level there are limited studies conducted at the national level to determine the individual and community level factors. Depression during childbirth can have several detrimental effects, including increased risk of complication and decreased satisfaction with birth, decreased trust in medical facilities, and decreased women's participation in maternity and newborn healthcare units.

Therefore, this study amid to reveal the prevalence of postpartum depression and associated factors at individual and community levels among women who give birth in Mozambique's recent data Demographic and Health Survey (DHS).

Research article ● *Open access*

Application of *Trichoderma harzianum* enhances salt tolerance and yield of Indian mustard through increasing antioxidant enzyme activity

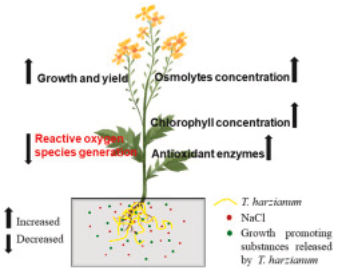
Kartik Chandra Saha, Md Kafil Uddin, Pallab Kumer Shaha, Md Akhter Hossain Chowdhury, ... Biplob Kumar Saha

Article e41114

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Research article ● *Open access*

Unveiling the nutritional and antioxidant properties of brown algae resources (*Dictyota* J.V. Lamouroux) from the Bay of Bengal and Arabian Sea, Indian coast

P. Chellamanimegalai, Geetanjali Deshmukhe, Amjad K. Balange, P. Layana

Article e40693

View PDF Article preview

FEEDBACK

Abstract

Abstract

Brown algae are increasingly recognized as a promising alternative food source due to their nutritious and bioactive properties. This study investigates the biochemical constituents and antioxidant properties of eight *Dictyota* species collected from the East and West coast of India, providing insights into their nutritional status for fulfilling dietary requirements. The analysis revealed significant levels of protein (6.67–19.27%), ash (16.48–52.55%), lipids (1.37–4.55%), carbohydrates (25.98–57.07%), and digestible energy (186.43–311.88 Kcal/100 g), indicating their potential as functional foods. *Dictyota* species were enriched in mineral contents, including Na (113–1973 mg/100 g), K (71–1487 mg/100 g), Ca (1773–11,108 mg/100 g), Mg (515–1138 mg/100 g), Fe (248–887 mg/100 g), Zn (1.2–3.6 mg/100 g), Cu (0.89–7 mg/100 g), and Mn (1–38 mg/100 g). Among these, Ca, Fe, Mg, and Mn obtained from 5.2 g of *Dictyota* contributed significantly (>15%) to the Recommended Dietary Allowance for Indians, highlighting their potential to address dietary mineral gaps. Similarly, chlorophyll *a* (1.351–3.478 mg g^{-1}), chlorophyll C1+C2 (0.664–1.720 mg g^{-1}), total carotenoids (0.427–1.763 mg g^{-1}), and fucoxanthin (0.058–1.741 mg g^{-1}) contents were notably high. Antioxidant properties were evaluated through total phenols and in-vitro antioxidant activities using different solvents, showing species-specific and solvent-specific variations ($p<0.05$).

Research article ● *Open access*

Long-term effect of repeated application of pig slurry digestate on microbial communities in arable soils

Daniela Mora-Salguero, Lionel Ranjard, Thierry Morvan, Samuel Dequiedt, ... Sophie Sadet-Bourgeteau

Article e41117

View PDF Article preview

Abstract

Abstract

Anaerobic digestion represents an opportunity for converting organic waste (OW) into valuable products: renewable energy (biogas) and a fertilizer (digestate). However, the long-term effects of digestates on soil biota, especially microorganisms, need to be better documented to understand the impact of digestate on soil ecosystem functioning and resilience. This study assessed the cumulative effect of repeated pig slurry digestate applications on soil microbial communities over a decade, using an in-situ approach to compare digested feedstock with undigested feedstock and other fertilization treatments. Conducted from 2012 to 2022 at an experimental field site in France, the study involved plots with identical agricultural soil management practices, differing only in fertilization treatments: mineral fertilizer, three different OW (cattle manure, pig slurry, pig slurry digestate), and a control with no organic or mineral fertilizer input. Changes in soil microbial communities were analyzed through molecular microbial biomass and diversity assessments using high-throughput sequencing targeting 16S and 18S ribosomal RNA genes. DNA extraction and molecular analyses were performed on soil samples collected at the start of the trial in 2012 and subsequently in 2017 and 2022. The long-term effects of annual digestate application over a decade include a higher soil microbial diversity in digestate-treated plots than in pig slurry-treated plots, and

Research article ● *Open access*

Identification and characterization of interacting proteins of transcription factor DpWRI1-like related to lipid biosynthesis from microalga *Dunaliella parva*

Lingru Ruan, Limei Huang, Lina Wu, Jinghui Gu, ... Changhua Shang

Article e41165

View PDF Article preview

Abstract

Abstract

Our previous study found that *Dunaliella parva* WRINKLED1-like (DpWRI1-like) was a key regulatory factor of lipid biosynthesis in *D. parva*. *DpWRI1-like* gene and target genes of DpWRI1-like have been obtained in our previous study, but the interacting proteins of DpWRI1-like are unclear now, which has limited a deep understanding of the function of DpWRI1-like. Yeast two-hybrid was widely used to identify protein-protein interaction. In this study, the interacting proteins of DpWRI1-like were obtained using yeast two-hybrid technique to further realize the role of DpWRI1-like. Three important interacting proteins have the following predicted activities: acyl-CoA-binding domain-containing protein 6 (interacting protein 1, ACBD6), duplicated carbonic anhydrase (interacting protein 2, DCA) and DNA-binding transcription factor (interacting protein 3, TF). Bimolecular fluorescence complementation assay further validated the interaction between DpWRI1-like and interacting proteins ACBD6 and DCA. The further bioinformatics analyses of interacting proteins were conducted. Protein-protein docking indicated the strong affinity between DpWRI1-like and three interacting proteins. Since interacting proteins have been found to be related to lipid biosynthesis in other organisms, this study contributes to a deeper understanding of the role of DpWRI1-like in lipid synthesis. In conclusion, this study firstly reported three

Research article ● *Open access*

Umbilical cord care practices and associated factors among mothers who gave birth in the last six months in hetosa district, Arsi zone, Ethiopia 2021: Community-based mixed design

Genat Balcha Abdi, Bekalu Kassie Alemu, Tensae KassaYizengaw, Beker Ahmed Hussein

Article e41133

View PDF Article preview

Abstract

Abstract

Background

Cord care is the series of steps applied to handle the umbilical cord after delivery of the newborn. Despite increasing the number of primary health facilities, unhygienic cord care remains persist.

Objective

To assess umbilical cord care practices and associated factors among mothers who gave birth in the last six months in Hetosa district, Arsi zone, Ethiopia, 2021.

Methods

A mixed-type cross-sectional study design was conducted in the Hetosa district of Arsi zone, from April 15 to May 15, 2021, with 550

Research article ● *Open access*

Effect of different post-processing conditions on the accuracy of liquid crystal display-printed orthognathic surgical splints

Siripatra Patchanee, Pokpong Amornvit, Maneethip Mortin, Narissaporn Chaiprakit

Article e41177

View PDF Article preview

Abstract

Abstract

Objectives

To evaluate the accuracy (trueness and precision) of liquid crystal display (LCD)-printed orthognathic surgical splints under two different post-processing conditions—rinsing solvent and post-polymerization time.

Materials and methods

An LCD 3D printer was used to create 48 surgical splints using the same reference standard tessellation language (STL) files. They were randomly assigned to two experimental studies. In the rinsing solvent study, 24 surgical splints were divided into three groups (n=8) based on their rinsing solvents: isopropyl alcohol (IPA), ethanol, and water. In the post-polymerization time study, 24 surgical splints were divided into three groups (n=8) based on the post-polymerization time: (3, 6, and 10 min). The surgical splints were covered with an opaque scanning spray, scanned, and converted into STL files. The images were trimmed and superimposed onto the reference STL file to evaluate trueness and precision, and the deviation was calculated using the root mean square (RMS) formula. Color map

Research article ● *Open access*

PVP-assisted MOF-derived Fe_3O_4/C powders for microwave absorption applications

V. Kavoosi, S.M. Masoudpanah

Article e41202

View PDF Article preview

Abstract

Abstract

Metal-organic framework (MOF) derived porous Fe_3O_4/C powders were applied for absorption of microwaves in the frequency range of 1–18 GHz. The effects of the polyvinylpyrrolidone (PVP) additive on the synthesis of MIL101-(Fe) precursor were studied by various characterization methods. By adding PVP, the impure hematite phase (α-Fe_2O_3) with magnetite phase (Fe_3O_4) was disappeared and the particular morphology was transformed to the porous rod-like, leading to the increase of specific surface area from 150 to 282 m^2/g. Furthermore, the saturation magnetization (Ms) of Fe_3O_4/C powders reached a maximum value of 47 emu/g at a proper amount of PVP. A thin absorber (2.6 mm) made of 50 wt% Fe_3O_4/C powders and 50 wt % paraffine absorbed the whole of X frequency band (8–12 GHz) with a minimum reflection loss of −20 dB at a matching frequency of 10 GHz. Adjusting the permittivity and permeability parameters of the Fe_3O_4/C powders via adding PVP was responsible for their better microwave absorption performance.

Research article ● *Open access*

Fabrication of biocidal materials based on the molecular interactions of tetracycline and quercetin with hydroxyapatite via *In Silico*- and In vitro approaches

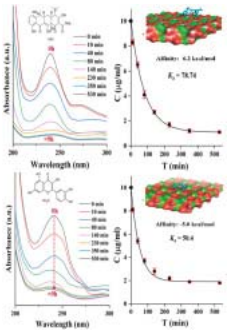
Anastasiia M. Isakova, Maxim A. Kutyrev, Aleksandra S. Kudasheva, Elizaveta V. Rogacheva, ... Ekaterina V. Skorb

Article e41064

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



FEEDBACK

Research article ● *Open access*

The stability improvements of dye-sensitized solar cell with natural template for photoanode using lignin extracted from rice husk

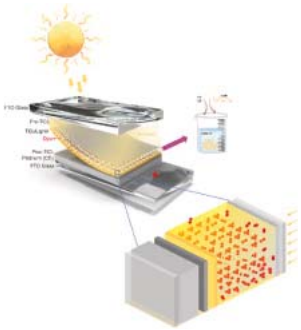
Gita Rabelsa, Shobih, Jojo Hidayat, Phutri Milana, ... Brian Yuliarto

Article e39913

View PDF Article preview

Abstract Graphical abstract

Graphical abstract



Research article ● *Open access*

Increased serum galectin-3 level is associated with endothelial dysfunction and cardiovascular events in patients with hypertension

Hui-Sheng Wang, Bang-Gee Hsu, Ji-Hung Wang, Chiu-Fen Yang

Article e41111

View PDF Article preview

Abstract

Abstract

Background

Endothelial dysfunction can lead to various harmful cardiovascular complications. The importance of galectin-3 (Gal-3) has been proposed in some cardiac diseases related to chronic inflammation. However, its role in hypertension-induced endothelial dysfunction remains unclear.

Methods

We enrolled 120 patients with hypertension, assessed their baseline characteristics, and monitored their 7-year cardiovascular outcomes. We performed an enzyme-linked immunosorbent assay to measure serum Gal-3 levels. The vascular reactivity index (VRI) was examined by digital thermal monitoring. Patients with VRI <1.0, 1.0 to <2.0, and ≥2.0 were defined as having poor, intermediate, and good vascular reactivity, respectively.

Research article ● *Open access*

Digital technology administrative penalties and green technology innovation: Evidence from China

Hong Li, Xiaohui Chen

Article e41159

View PDF Article preview

Abstract

Abstract

In digital economy era, digital technology is a key force to promote green technological innovation (GTI). Digital technology administrative penalties (DTAP) are an important means to regulate the development of digital technology enterprises, but its ability to effectively guide digital technology enterprises to better serve GTI remains to be further examined. DTAP sends signals to physical enterprises, financial enterprises, and individuals, thereby affecting the allocation of resources, such as technology, talent, and funds. Green technology innovation requires support from these resources, raising the question of how DTAP may affect GTI. This study

proposes hypotheses based on signal theory and uses urban data from China from 2008 to 2020 to empirically test the impact of DTAP on GTI. The research findings indicate that DTAP is conducive to improving regional GTI, and DTAP facilitates GTI by fostering digital industrialization and financial technology development. The heterogeneity analysis reveals that the DTAP has a stronger promotion effect on the GTI in municipalities and low-carbon pilot cities. Our research is meaningful and can serve as a reference for other developing countries to standardize administrative supervision of the digital economy and promote the green economic

Previous vol/issue

Next vol/issue

ISSN: 2405-8440

Heliyon

COUNTRY

United Kingdom

Universities and research institutions in United Kingdom

Media Ranking in United Kingdom

SUBJECT AREA AND CATEGORY

Multidisciplinary
Multidisciplinary

PUBLISHER

Elsevier Ltd

SJR 2024

0.644 Q1

H-INDEX

115

PUBLICATION TYPE

Journals

ISSN

24058440

COVERAGE

2015-2025

INFORMATION

Homepage

How to publish in this journal

c.schulz@cell.com

SCOPE

Heliyon is an all-science, open access journal that is part of the Cell Press family. Any paper reporting scientifically accurate and valuable research, which adheres to accepted ethical and scientific publishing standards, will be considered for publication. Our growing team of dedicated section editors, along with our in-house team, handle your paper and manage the publication process end-to-end, giving your research the editorial support it deserves.

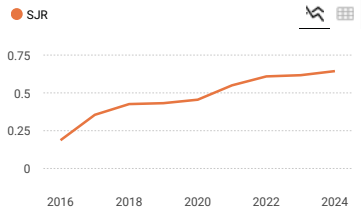
Join the conversation about this journal

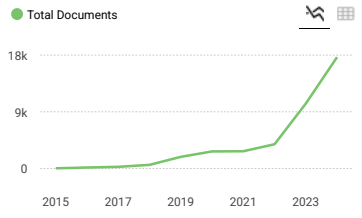
Quartiles

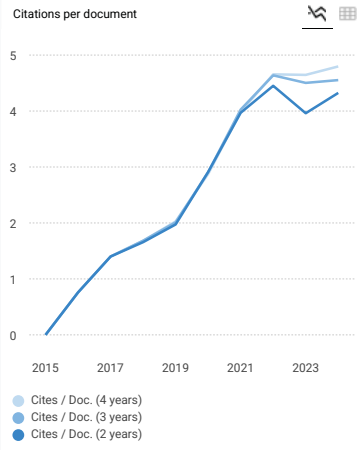
FIND SIMILAR JOURNALS

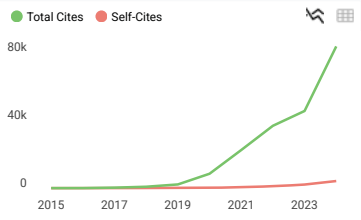
options

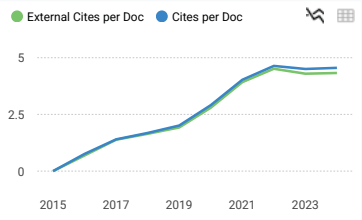
1	2	3	4	5
Scientific African	Scientific World Journal	Science Progress	Trends in Sciences	Journal of King Saud University - Science
NLD	GBR	GBR	THA	NLD
69% similarity	61% similarity	60% similarity	59% similarity	57% similarity

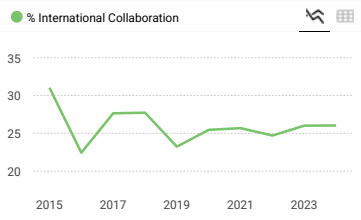


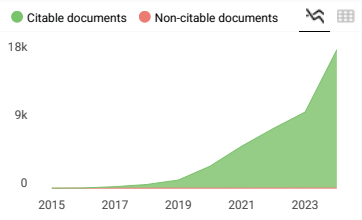


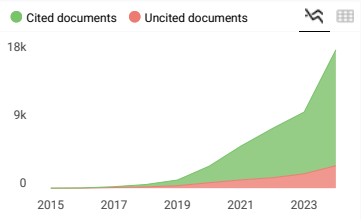


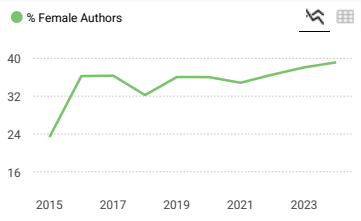


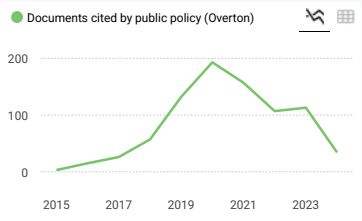


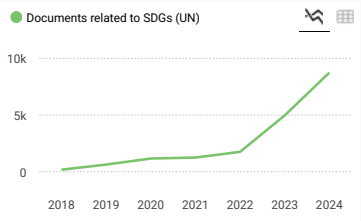


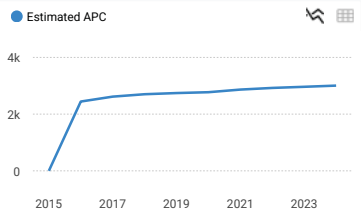


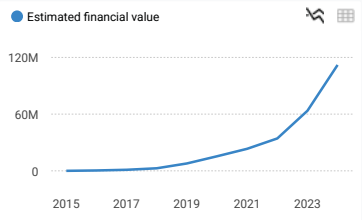


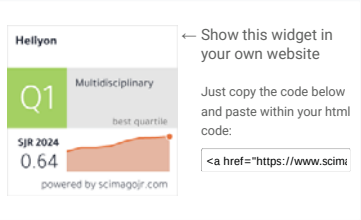












Metrics based on Scopus® data as of March 2025

sariayu sibarani 1 month ago

please, take template heliyon juornal

reply

SCImago Team

Melanie Ortiz 1 month ago

Dear Sariayu,
Thank you for contacting us. Please see the comments below.
Best Regards, SCImago Team

N **Name Hass** 3 months ago

What is the latest situation with WOS?

reply

SCImago Team

Melanie Ortiz 3 months ago

Dear Name,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

M **Manzura** 3 months ago

I would like to inform you about the fact that this journal is excluded from Scopus in 2024, Be careful and do nat publish your articles in this journal.

reply

A **Abdulla** 3 months ago

According to Scopus website, the journal is covered by Scopus from 2015 to 2025. The exclusion list published in 2024 does not list Heliyon being excluded. Could you please share your source? Here is mine:

https://www.scopus.com/sourceid/21100411756?origin=resultslist#tabs=0

D **Dipu** 5 months ago

Editor of this journal was very responsive. My experience was very good. I highly recommend this journal.

reply

A **Ali** 4 months ago

what is the current status of this journal? As we saw a news of it being on hold by WoS.

SCImago Team

Melanie Ortiz 4 months ago

Dear Dipu, thanks for your participation! Best Regards, SCImago Team

R **R.SIVARANJANI** 8 months ago

Dear sir,

Im intreast to sumbit my paper, may i know about APC Charge? How many days to take accpetance and publication ?

reply

SCImago Team

Melanie Ortiz 8 months ago

Dear Sivaranjani,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

S **Scholarly Criticism** 1 year ago

This is the latest story we broke. We hope Scimago will approve this comment:

Elsevier Unethically Promotes its Journals via Scopus: The Case of Heliyon

https://scholarlycritic.com/elsevier-unethically-promotes-its-journals-via-scopus-case-of-heliyon.html

reply

M **MUDITHA** 1 year ago

what is the ranking of this journal article.(how many stars)
ISSN 24058440
PUBLISHER Elsevier Ltd
Title -A cross-cultural comparison of work engagement in the relationships between trust climate – Job performance and turnover intention: Focusing China and Pakistan
Authors Aini Aman, Muhammad Rafiq , Omkar Dastane

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Muditha,
Thank you for contacting us. Could you please expand a little bit on your request so we can assist you better?
Best Regards, SCImago Team

J **Jose** 1 year ago

How much does it cost to publish an article with you?

Thanks

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Jose,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

M **Muluneh Getaneh Tegegn** 1 year ago

Thank you, in advance.
On average, How long does Heliyon take to accept my manuscript?
Thanks

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Muluneh,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

J **Jacobus H. de Waard** 1 year ago

Does this journal publish methods papers?

Jacobus

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Jacobus,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

O **Oussama Khouili** 1 year ago

please is this journal Q1 or Q2 for 2024??

reply

J **Jose** 1 year ago

Hi Melanie,

I would like to know if Heliyon is a peer reviewed journal.
Thanks.
Regards,

jose

SCImago Team

Melanie Ortiz 1 year ago

Dear Jose,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

SCImago Team

Melanie Ortiz 1 year ago

Dear Oussama,
Thank you for contacting us. Our data come from Scopus, they annually send us an update of the data. This update is sent to us around April / May every year. The SJR for 2022 was released on 1st May 2023. Therefore, the indicators for 2023 will be available in May/June 2024.
Best Regards, SCImago Team

O **Olga** 1 year ago

Hi!

I submmited a paper in 16st may, recently (about 5 days) there was the notification that It has 2 reviews. I have sent email yo the editor asking about the decision and status of my paper, however nobody answer. What can I do? What should I do if I want to send It to another journal? In the plataform there isn't comments neither instructions.

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Olga, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

H **Hana** 2 years ago

Hello..
How long does the research take to be accepted for publication?
I want the research to be published before 8/30/2023. Is this possible?

reply

N **Natt Pimpa** 2 years ago

I have recently got my paper accepted there and it took 11 months (5 revisions). Good learning process.

W **WARMAN** 2 years ago

I have a paper I want to submit to Heliyon with the title Improving the Pedagogical Competence of Elementary School Teachers in West Kutai Indonesia through the Utilization of Academic Supervision.

Is there an opportunity to publish it ???

M **Mohamed** 2 years ago

Hi,
Unfortunately it takes very long, I have submitted my paper in March and still under review :(

SCImago Team

Melanie Ortiz 2 years ago

Dear Hana,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

H **Hendy satria** 2 years ago

Hello, Is the journal category still multidisciplinary? Or will there be changes in the near future?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Hendy,
Thank you for contacting us.
You can consult the journal's categories just above.
Best Regards, SCImago Team

R **rizal** 2 years ago

Hello
does the heliyon journal have scope in the field of language?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Rizal,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

A **Adan DORIA** 2 years ago

Buen día, por favor me podría indicar en que cuartil se encuentra esta revista? coordine con Scopus pero me indican que coordinen con ustedes Scimago. Gracias por la repuesta.

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Adan, thank you very much for your request. You can consult that information just above. Best Regards, SCImago Team

Mubbasher munir 3 years ago

Hi

What is the status of journal in 2022?

Is it recognized yet?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Mubbasher,
Thank you very much for your comment.

Source details

Heliyon

Open Access

Years currently covered by Scopus: from 2015 to 2025

Publisher: Elsevier

E-ISSN: 2405-8440

Subject area: Multidisciplinary

Source type: Journal

CiteScore 2023
4.5

SJR 2023
0.617

SNIP 2023
1.257

View all documents > | Set document alert | Save to source list

CiteScore | CiteScore rank & trend | Scopus content coverage

CiteScore 2023

$$4.5 = \frac{88{,}206 \text{ Citations } 2020 - 2023}{19{,}663 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

CiteScoreTracker 2024

$$4.1 = \frac{139{,}871 \text{ Citations to date}}{34{,}505 \text{ Documents to date}}$$

Last updated on 05 April, 2025 • Updated monthly

CiteScore rank 2023

Category	Rank	Percentile
Multidisciplinary		
Multidisciplinary	#31/171	82nd

View CiteScore methodology > | CiteScore FAQ > | Add CiteScore to your site

Feedback

About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

Language

日本語版を表示する

查看简体中文版本

查看繁體中文版本

Просмотр версии на русском языке

Customer Service

Help

Tutorials

Contact us

ELSEVIER

Feedback

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2021 was released on 11 May 2022. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.
The Scopus' update list can also be consulted here:
https://www.elsevier.com/solutions/scopus/how-scopus-works/content
Best Regards, SCImago Team

S **Safa** 3 years ago

Dear Sir,

Could you provide me if this journal is included in the Scopus and Clarivate lists?

Regards
Safa

reply

Z **zul** 2 years ago

Heliyon is still in scopus list as in nov 2022 (extlistNovember2022.xlsx)
https://www.scopus.com/sources.uri?zone=TopNavBar

SCImago Team

Melanie Ortiz 3 years ago

Dear Safa,
Thank you for contacting us.
SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request referring to the index status. We suggest you consult Scopus database (see the current status of the journal) or the mentioned database for further information.
Best Regards, SCImago Team

A **Anwar** 4 years ago

What is the difference between Heliyon Elsiever and Heliyon Cell press

reply

W **Wilson Rajagukguk** 3 years ago

Dear Melanie

I have a manuscritp underreview by Heliyon. There is rumor in Inoonesia that Heliyon is under review and in danger to be discotinued by Scopus. I am worry about the rumor.

Can you explain and give the assurance of status and continuation in Scopus?

Thank you so much

SCImago Team

Melanie Ortiz 3 years ago

Dear Wilson,
Thank you for your comment.
Our data source is Scopus, SCImago doesn't participate in the journal's selection. SCImago has no authority to include or exclude SJR journals. Please contact Scopus Support regarding this matter here:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/
Best Regards, SCImago Team

G **Gerald Cleaver** 3 years ago

I am the editor of Heliyon Physics. There is no difference. Cell Press is a division of Elsevier. The latter placed Heliyon under the auspices of Cell Press about two years ago.

SCImago Team

Melanie Ortiz 4 years ago

Dear Anwar,

Thank you for contacting us. We suggest you consult the link below:
https://en.wikipedia.org/wiki/Cell_Press
Best Regards, SCImago Team

S **siavash sharifi** 4 years ago

Dear Secretary
Please how much rate the Impact factor and Quarterly of Heliyon journal?

Wishing you good health
Dr Siavash sharifi

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Siavash, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

S **Sherif Mohamed shawky** 4 years ago

I would like to ask about the journal impact factor.
It is not mentioned in clarivate and SJR.
It is only showing the quartile.

Many Thanks
Sherif shawky

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Sherif, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

M **M.Shravanthi Bandari** 4 years ago

Hello,

Can I know if Heliyon is in UGC approved 2020-2021 journal's list and can I know it's IF.

reply

S **SANAA** 6 months ago

YES, ITS UGC

SCImago Team

Melanie Ortiz 4 years ago

Dear M.Shravanthi , thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source.
Best Regards, SCImago Team

A **Ajmal Hameed** 4 years ago

Dear

How can I submit my paper to this journal? pleas send me the procedure.

Thank you,
Ajmal

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Ajmal, thank you very much for your comment, we suggest you look for the author's instructions/submission guidelines in the journal's website. Best Regards, SCImago Team

A **Asmaa** 4 years ago

Is this journal free for Egypt?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Asmaa,
Thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

D **Dr. Md. Ismail Hossain** 4 years ago

APC for this journal showing USD 1750. How can I ger wave for this APC? Please let me know asap.

reply

N **Nur Hasan Mahmud Shahen** 4 years ago

Dear,
What country do you belong? If its type C country then its autometicly reduceed.
or If you can write to the head of Elsevier publisher then they can minimize it.
Pleace go to the journal APC process for more details.
Thank you.

SCImago Team

Melanie Ortiz 4 years ago

Dear Dr. Md. Ismail, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

Z **zainal hasan** 4 years ago

In the near future, I will submit it to this journal. best regards...aez hasan

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Zainal, thanks for your participation! Best Regards, SCImago Team

M **Mohamed E. Hasan** 4 years ago

what is the impact factor of this journal?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Mohamed, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

O **Omolara** 4 years ago

Please tell us the publication fee

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Omolara,
Thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

W

wasim bari 4 years ago

In heliyon journal what is the time to decision after submit the paper correction according to reviewer question?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Wasim,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

C

Cristian Torres 4 years ago

When will Heliyon have the impact factor calculated? Is there an estimated date?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Cristian, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

M

Mark 4 years ago

It is an unreliable journal. A year after sending my manuscript, they told me that it was initially accepted, there were minor revisions, I made the respective corrections, six months passed and they did not give me a response. I sent my manuscript to another journal and in four months they accepted it without a publication charge and it is also Q1.

reply

T

Tayme 2 years ago

can you please tell me the the name of the journal accepted your paper?
and how you are withdrawn the Research from the journal ?

W

Wilson Rajagukguk 3 years ago

Hi Mark

I need your help. Can you tell me the second journal? thank you so much

A

Anna 3 years ago

Hello Mark
Please help me to send my paper to second journal that you mentioned it .
It is emergency.
Thanks

A **Au Tang** 3 years ago

HI Mark. Thank you very much for your information. COuld you please tell me (My email: tangau.qth@gmail.com) the second journal you submitted and got acceptance in 4 months. I am appreciated it.

M **Magdy Fouad** 4 years ago

Dear Mark
Can you tell me the name of the journal that accept your paper in 4 months please?
I need rapid publication in Q1 journal for my upgrading.
Thanks

Mey 4 years ago

Hi, Mark! I wonder if you can share here the second journal where you submitted your manuscript. It's interesting that a Q1 journal responds and decides in 4 months.

D **Dyg** 4 years ago

Hi Mark...just curious which journal did you submit the second and got accepted...it is Q1 and no charge...that is good..

U **unkown** 4 years ago

I am having a similar probelm like marK. i Submitted my paper in july 2020. They gave me major revisions to do after 4 months.After i made the respective corrctions and resubmitted the revised one in december . After 2 months they told me decision is under process. After few days status changed to decision rescinded. Now the new status is showing as reviewer invited. I am wondering what will be the future of my paper with this journal.Any suggetsons will be highly aprecaited . Kindly suggest me how to expedite with this journal. Please.What shoud be the best way to do as of now

M **Mahmud** 4 years ago

You could just mail them. They response very frequently. Moreover, many of the journals take too much time in publishing papers. Sometimes, reviewers delay for personal reasons.

If you face similar problem, i recommend you to mail them.

SCImago Team

Melanie Ortiz 4 years ago

Dear Mark, thanks for your participation! Best Regards, SCImago Team

B **Biyanu Medenes Zerom** 4 years ago

what is the JIF (Journal Impact factor) of this journal

reply

E **Ebtesam** 4 years ago

Journal Impact factor of this journal is still not calculated, it is indexed in WOS, Emerging citation index source which means that the journal has been already already in WOS but didn't get IF yet. But it is growing journal. Its citation is increasing in good way.

SCImago Team

Melanie Ortiz 4 years ago

Dear Biyanu, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

N **Nazmul** 4 years ago

Is Heliyon a good journal? How many issues does it publish in a year?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Nazmul,

Thank you for contacting us. You can check the scientometric indicators for Heliyon just above. For further information about the publication frecuency, please consult its website.

Best Regards, SCImago Team

M **Mohamed** 4 years ago

Hello,
Does this journal is indexed as ISI journal

Thank you in advance

reply

E **Ebtesam** 4 years ago

Yes, it is indexed.

L **Lanfranco Corazzi** 4 years ago

Dear team,
when Heliyon will be mentioned by WOS (WEB OF SCIENCES) in the Journal Citations Reports?
Many thanks for your reply.
Lanfranco Corazzi

SCImago Team

Melanie Ortiz 4 years ago

Dear Lanfranco,

Thank you for contacting us . Unfortunately, we cannot help you with your request, we suggest you contact WoS Team.

Best Regards, SCImago Team

SCImago Team

Melanie Ortiz 4 years ago

Dear Mohamed,
Thank you for contacting us.
SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request referring to the index status. We suggest you consult Scopus database (see the current status of the journal) or the mentioned database for further information. You can also check that information in the journal's website or contact directly with the editorial staff.
Best Regards, SCImago Team

A **aspirant eagle** 5 years ago

- what does the quartile mean? What is it's importance?
-And Why the journal quartile her is Q1 but in the scoups is Q2?

Thanks

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Sir/Madam,

Thank you for contacting us.

Our data come from Scopus, they annually send us an update of the data. This update is sent to us around April / May every year.
The calculation of the indicators is performed with the copy of the Scopus database provided to us annually. However, the methodology used by Scopus is different from the one's used by SCImago, even if, since the past year, the scientometrics indicators' calculation procedure changed in order to resemble SciVal.

In the case of SCImago, for every journal, the annual value of the SJR is integrated into the distribution of SJR values of all the thematic categories to which the journal belongs. There are more than 300 thematic categories; the position of each journal is different in any category and depends on the performance of the category, in general, and the journal, in particular .
The SJR indicator is a very sophisticated indicator that is much more complex to calculate and understand than the Impact Factor. Several variables must be taken into account to calculate the SJR. There are two important variables that we cannot leave out:

-The number of citations is one of those variables but not the only one because it is weighted by the citations received and where the journal is cited in. It is different if the citations come from highly-cited Journals or not. Imagine that these 5 quotes appear in the most cited Journals. That part of the calculation is no longer worth 5, it is worth much more. This variable is called "authority principle".

-The second variable is the thematic Category's distribution. If most of the journals categorized in X thematic category are cited by lowly-cited journals, the quartile of a journal cited in highly-cited journals will be better than the other ones.

Best Regards, SCImago Team

D **Daniel Bravo** 5 years ago

Dear Editors team,

I would like to know what is the frame-time to the first answers of revision (in weeks). All the very best.

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Daniel,
thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

K **kahsu Atsbha** 5 years ago

What is the difference between Heliyon cell press and heliyon Elsevier? Are they the same or not?

reply

R **Rocktim R Das** 4 years ago

Thanks, Kahsu,

I too was thinking about this issue, In the online HTML I see the Elsevier logo and Cell press, but when downloading the pdf only the cell press logo is present. One possibility might be that the journal is published by Cell press but hosted by Elsevier in Science direct.com. Apart from that, I don't have much clue.

Sincerely
Rocktim

SCImago Team

Melanie Ortiz 5 years ago

Dear Kahsu,
Thank you for contacting us. Could you please expand a little bit your comment? Do these journals have different ISSN numbers? Best Regards, SCImago Team

H **Hesti Maheswari** 5 years ago

Is the Heliyon journal still indexed by Scopus in 2019?

reply

R **Rocktim R Das** 4 years ago

Yes.

A **Achmad Fanani** 5 years ago

Masih

SCImago Team

Melanie Ortiz 5 years ago

Dear Hesti, thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you to consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.
Best Regards, SCImago Team

F **Frank** 5 years ago

That is not the scope of the journal. Change it to the scope...
https://www.cell.com/heliyon/home

"Heliyon is an open access journal publishing scientifically accurate and valuable research across life, physical, social, and medical sciences."

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Frank,

thank you for contacting us. The Scope's information has been updated based on what appears in the journal's website (check here: https://www.cell.com/heliyon/aims-and-scope) Best Regards, SCImago Team

G **GsmA** 5 years ago

Thanks...

reply

G **GsmA** 5 years ago

Hi,

Just I want to ask about the fees to publish in the journal, can you help me?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Sir,
thank you for contacting us.
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

A **Ali** 5 years ago

Dear All,

I hope anybody knows about the speed of response and decision it takes to let us know about it.

Best Regards,

reply

S **Sintayehu** 4 years ago

I published one paper on Heliyon Social Sciences and another one is just accepted for publication. They announce the first review result in 90 days. I found the review process a little bit slow but very thorough and helps a lot to improve the original work. Preliminary decision for publication will be communicated one month after the submission of the revised version of the work. Final decision of publication will be announces after two weeks. In total,

it took six months to publish.

H **Hamzeh Ghahramani** 5 years ago

They gave me the first decision after 3 week with a meticulous review of my manuscript

SCImago Team

Melanie Ortiz 5 years ago

Dear Ali, thanks for your participation! Best Regards, SCImago Team

K **Khaled Karam** 5 years ago

Hi,

Is this journal published in print or online only?

Thanks for your consideration

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear user,
thank you for contacting us.
We suggest you to visit the journal's homepage.
You can see the updated journal's information just above .
Best Regards, SCImago Team

D **Dan** 5 years ago

This journal was started in 2015. It has achieved scopus Q1 rank becasue this is Elsevier's own journal. It is also indexed in ESCI. I can see that publishing giants have their own journals indexed with their own databases. Other journals would take years to get indexed in such databases. It all about money. Cheers!

reply

R **Rhys** 5 years ago

I believe this is a Cell Press Journal rather than Elsevier https://www.cell.com/heliyon/home

SCImago Team

Melanie Ortiz 5 years ago

Dear Dan, thanks for your participation! Best Regards, SCImago Team

M **Mahesh Kumar Tripathi** 6 years ago

Hello Elena,
Please tell me.....
Is Heliyon SCI journal?
When it will get impact factor?

reply

SCImago Team

Melanie Ortiz 6 years ago

Dear Mahesh, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our web to locate the journal. We suggest you to consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

H **Hossein Sabahi** 6 years ago

Dear Editor
how many is the charge for publication a article ?

Sincerely
Dr. H. Sabahi

reply

M **Messali** 5 years ago

1750 USD

SCImago Team

Melanie Ortiz 6 years ago

Dear Hossein,
thank you for contacting us.
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
You can see the updated journal's information just above .
Best Regards, SCImago Team

Z **Zemenu Bires** 6 years ago

in which index Heliyon is indexed? would you tell me please?

reply

SCImago Team

Melanie Ortiz 6 years ago

Dear user, we suggest you to consult that information in the journal's website. You can also consult the Scopus database directly. Best Regards, SCImago Team

Z **Zemenu Bires** 6 years ago

Would you mind telling me about Heliyon journal in which it is indexed; Scopus, SCI, ISI-index/ Scopus or any index?

reply

SCImago Team

Melanie Ortiz 6 years ago

Dear user, we suggest you to consult the journal's website or Scopus database directly. For other indicators like ISI or Impact Factor, we suggest you to consult the Journal Citation Report with a Web of Science data source. Best Regards, SCImago Team

S **Santosh** 6 years ago

Hi,
Can you please tell when Heliyon expected will get impact factor (will come under sci or esci)?

reply

SCImago Team

Melanie Ortiz 6 years ago

Dear user, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our web to locate the journal. We suggest you to consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

D **Deni** 6 years ago

Dear Elena, How long has Heliyon released the article, I have submitted?

reply

SCImago Team

Elena Corera 6 years ago

Dear Deni,
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you look for author's instructions in the journal's website.
Best Regards,
SCImago Team

S

SIFI 6 years ago

what are the favorite and targeted topics in this journal?

reply

A

Ali 6 years ago

Hello,

I read in your website that this journal is not free of charge for publication. let me know that is it true?
thanks.

reply

SCImago Team

Elena Corera 6 years ago

Dear Ali,

Please, check comments below.

Best regards,
SCImago Team

H

Harjali 6 years ago

Nice to meet you, could you give me detail information of Heliyon Journal? I have checked it at SJR that this journal has 7 H Index and Q1, It is right?. thank you very much.

Best regards

Harjali

reply

F

Foad buazar 7 years ago

Hi
I wonder how a journal like Heliyon Rank Q1 but without impact factor?
I am really confused. Would you please clarify the vague feeling of authors concerning this notion?

Thank you

reply

SCImago Team

Elena Corera 6 years ago

Dear Foad,

you can check impact factor in SJR website.

Best regards,
SCImago Team

A

Achmad Herman 7 years ago

Dear Colleagues
I am interested to submit a paper (or more) to your journal... I would like to ask about the average period from date of submission to date of publication (if the paper is accepted)... and also about the fees (if any). Thank you..

Achmad Herman

reply

SCImago Team

Elena Corera 7 years ago

Dear Achmad, we suggest you locate the author's instructions on the journal's website. Best Regards, SCImago Team

N

Nahed 7 years ago

Hello,

Is it possible to know if this Journal is indexed in Thomson Reuters (M)?

Best

reply

SCImago Team

Elena Corera 7 years ago

Dear Insum, we suggest you contact the journal directly. Best Regards, SCImago Team

H

Hashim 7 years ago

Dear Sir or Madham
Could you please give me the impact factor for this journal ?
best regards

reply

M

Maria Helena Andrade Santana 7 years ago

Dear Sir or Madham
Could you please give me the impact factor for this journal ?
best regards

SCImago Team

Elena Corera 7 years ago

Dear Maria Helena, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

SCImago Team

Elena Corera 7 years ago

Dear Hashim, the SJR data of the journal are on this page, see the evolution graphs of the indicators above. Best Regards, SCImago Team

M

Mikle 7 years ago

Hello,
Does this journal has or will have an impact factor?
Thank you in advance

reply

SCImago Team

Elena Corera 7 years ago

Dear Mikle, SJR uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators with a Web of Science data source. Best Regards, SCImago Team

J

Jad 7 years ago

Hello,

The is possibility to send me a topic of your journal.

Best Regard
Jad Tahouri

reply

Elena Corera 7 years ago

SCImago Team

Dear Jad, we suggest you contact the journal directly. Best Regards, SCImago Team

Leave a comment

Name

Email
(will not be published)

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.