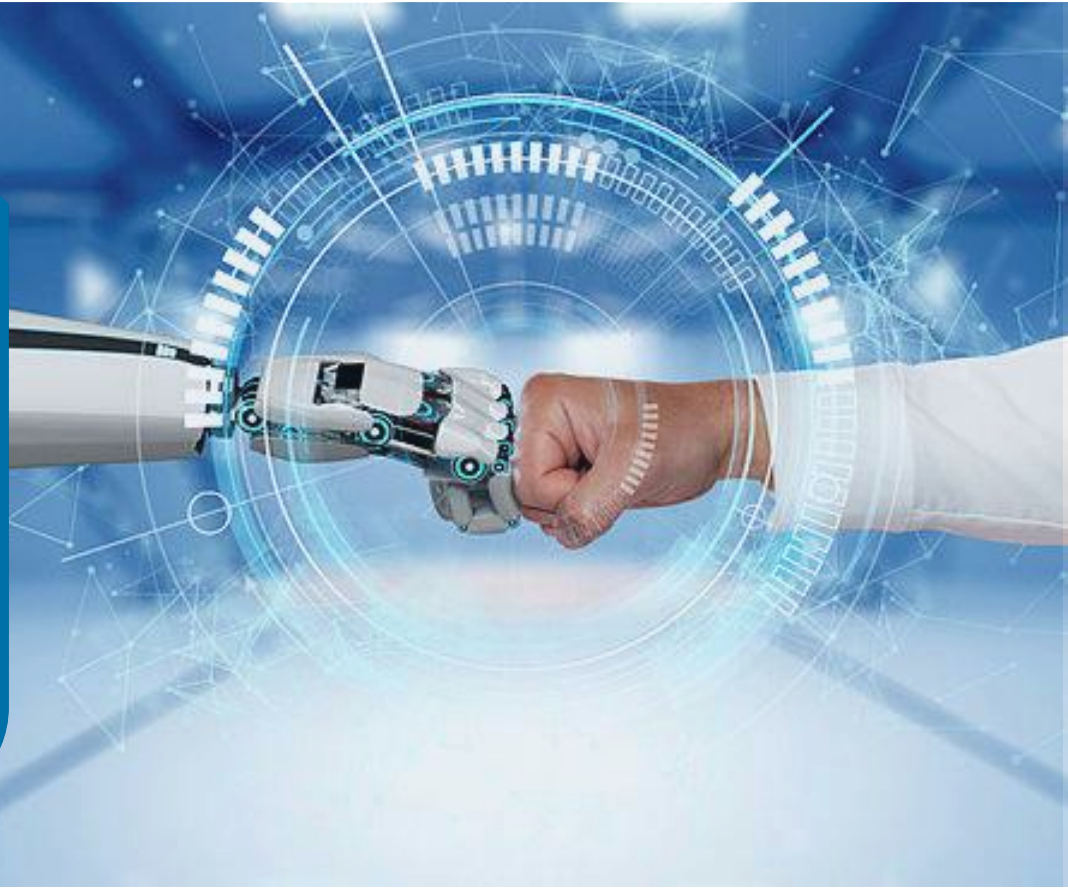
Summaries: AI Generated & Expert Verified

Transform Research into Clear Communication

October 2024



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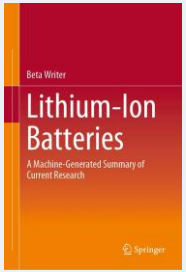
SN has been using AI for over 10 years

29+ AI BOOKS PUBLISHED SO FAR,
TOTAL OF 50 TO BE PUBLISHED BY EOY



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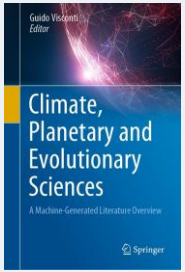

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Technology also being used to help create table of contents, find additional literature, produce auto-generated summaries.

More than 2,000 auto-generated literature overviews provided for our authors.

HOW AI IS HELPING US TO OPEN UP SCIENCE

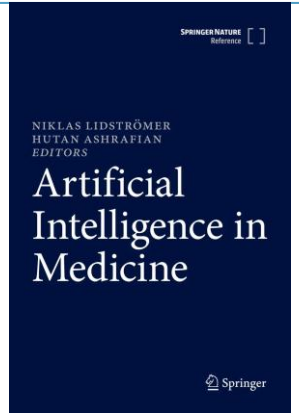
- **Making it easier to publish and communicate**
- **Removing barriers for sharing research**
- **Promoting transparency in science**
- **Supporting collaborative networks**

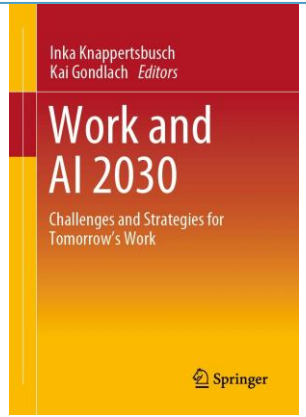
BUT… AI is a means, not an end. Focus is always on the user and a human-centred approach to AI.

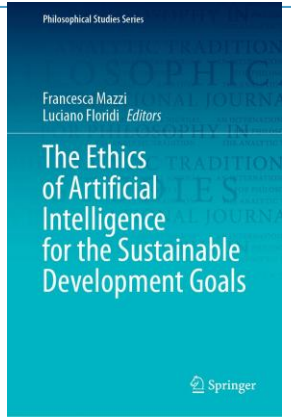
SPRINGER NATURE GROUP

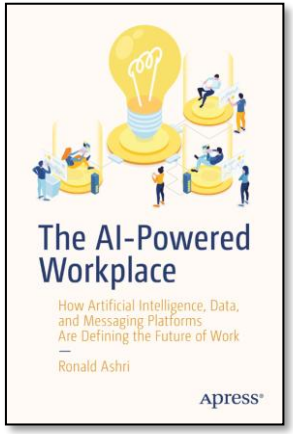
We are also a leading publisher on AI

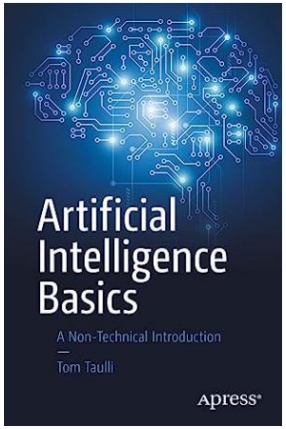
100+ Books

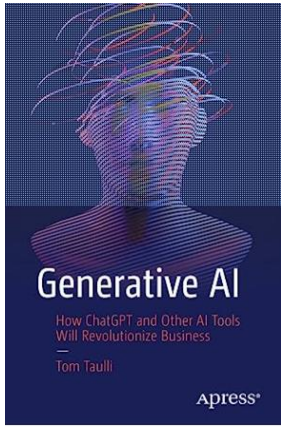


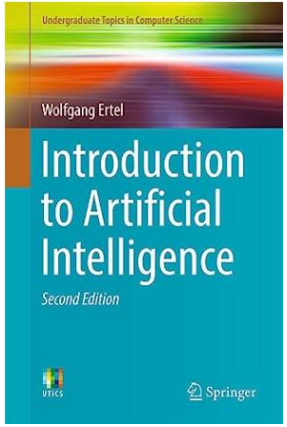


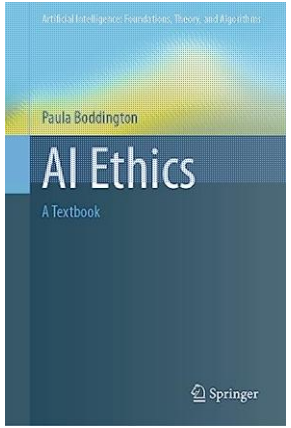


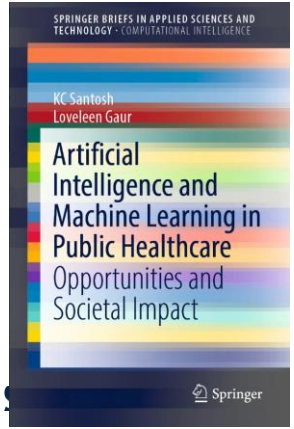






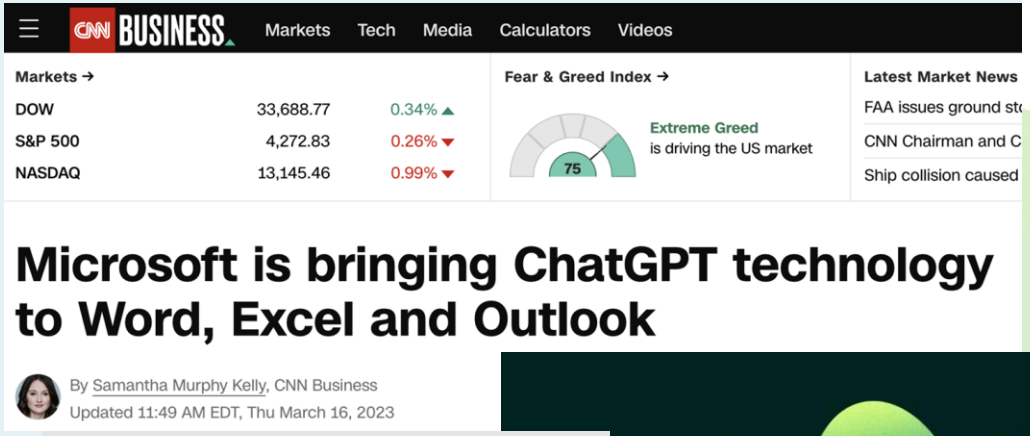


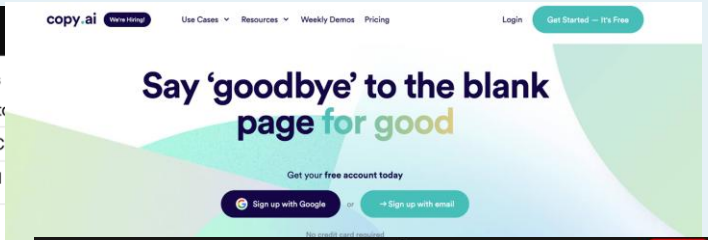


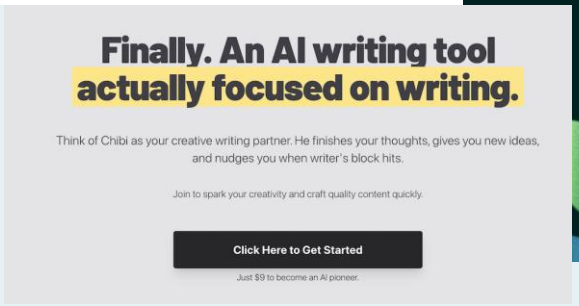


More titles here: https://docs.google.com/spreadsheets/d/1QP1H2QOtqRebGdXiVopTQScVZW8aoVjRX1kJR_ZNb9k/edit#gid=0

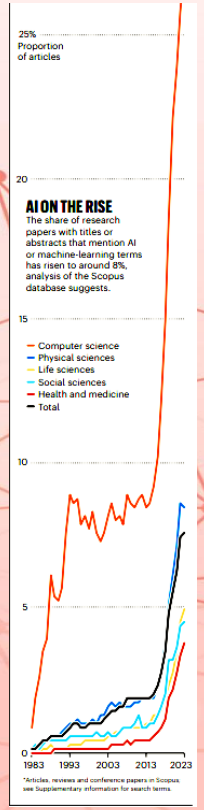
Do large language models and generative AI transform the way we write?

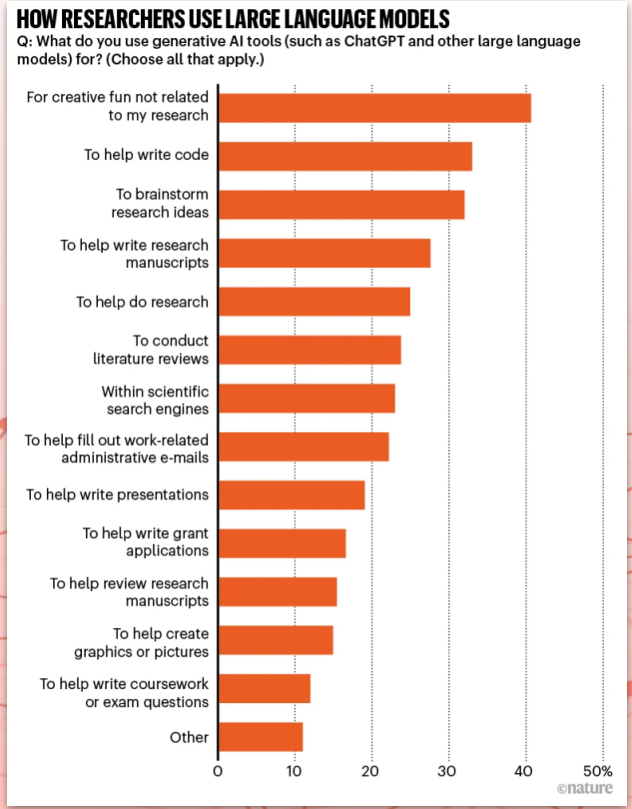


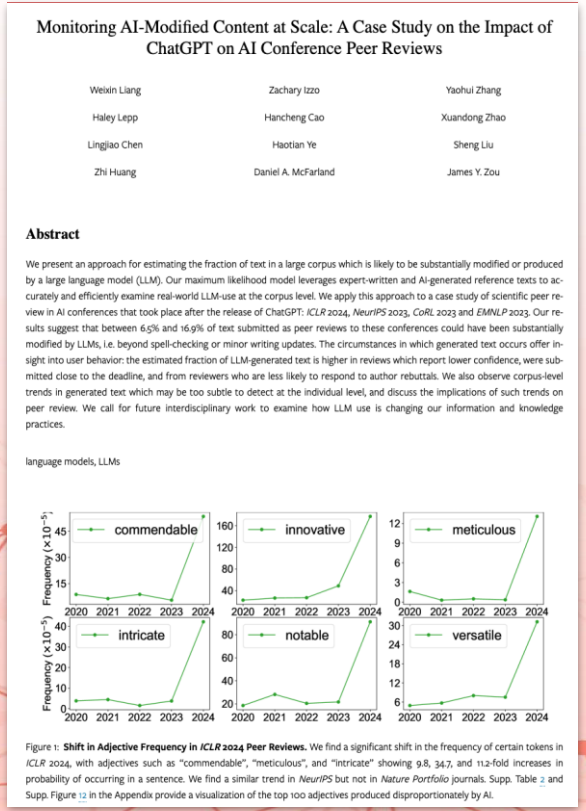




Researchers already use AI







Monitoring AI-Modified Content at Scale: A Case Study on the Impact of ChatGPT on AI Conference Peer Reviews

Weixin Liang, Zachary Izzo, Yaohui Zhang, Haley Lepp, Hancheng Cao, Xuandong Zhao, Lingjiao Chen, Haotian Ye, Sheng Liu, Zhi Huang, Daniel A. McFarland, James Y. Zou

Abstract

We present an approach for estimating the fraction of text in a large corpus which is likely to be substantially modified or produced by a large language model (LLM). Our maximum likelihood model leverages expert-written and AI-generated reference texts to accurately and efficiently examine real-world LLM-use at the corpus level. We apply this approach to a case study of scientific peer review in AI conferences that took place after the release of ChatGPT: *ICLR* 2024, *NeurIPS* 2023, *CoRL* 2023 and *EMNLP* 2023. Our results suggest that between 6.5% and 16.9% of text submitted as peer reviews to these conferences could have been substantially modified by LLMs, i.e. beyond spell-checking or minor writing updates. The circumstances in which generated text occurs offer insight into user behavior: the estimated fraction of LLM-generated text is higher in reviews which report lower confidence, were submitted close to the deadline, and from reviewers who are less likely to respond to author rebuttals. We also observe corpus-level trends in generated text which may be too subtle to detect at the individual level, and discuss the implications of such trends on peer review. We call for future interdisciplinary work to examine how LLM use is changing our information and knowledge practices.

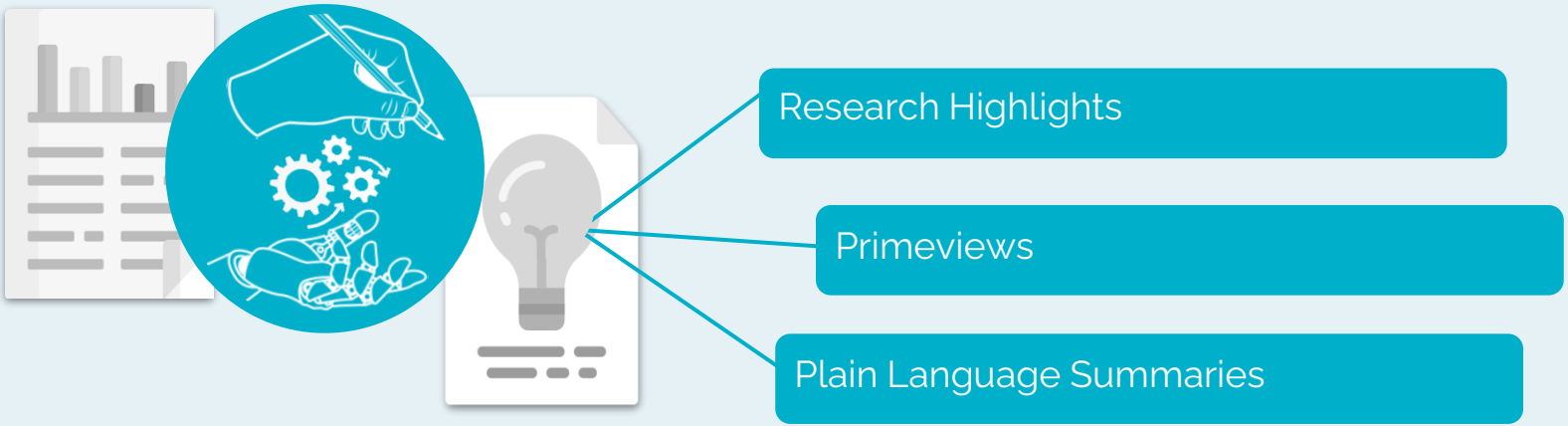
language models, LLMs

Figure 1: **Shift in Adjective Frequency in *ICLR* 2024 Peer Reviews.** We find a significant shift in the frequency of certain tokens in *ICLR* 2024, with adjectives such as "commendable", "meticulous", and "intricate" showing 9.8, 34.7, and 11.2-fold increases in probability of occurring in a sentence. We find a similar trend in *NeurIPS* but not in *Nature Portfolio* journals. Supp. Table 2 and Supp. Figure 12 in the Appendix provide a visualization of the top 100 adjectives produced disproportionately by AI.

SPRINGER NATURE

Augmented content creation

Our **internal AI tool for editors and medical writers** allows a **human-machine handshake** for augmented **content creation with large language models.** It processes information from research articles, clinical reports and crafts simple, concise, and engaging summaries and offers it to a professional, or SME for human fact check to ensure reliability and accuracy.



Research Highlights

A brief summary of a recently-published research article selected by the editorial team, thought to be of particular interest to readers. First AI-generated Research Highlight published by Nature India in January 2023.

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nature › nature india › research highlights › article

RESEARCH HIGHLIGHT | 19 January 2023

Machine learning to help restore world's largest mangrove

Study prioritizes areas of Sundarban for replanting

[This text was generated using artificial intelligence (GPT-3) and underwent subsequent human editing to ensure accuracy.]

The study prioritizes portions of the Indian Sundarban for magrove replantation. Credit: Subhra Priydarshini

nature india

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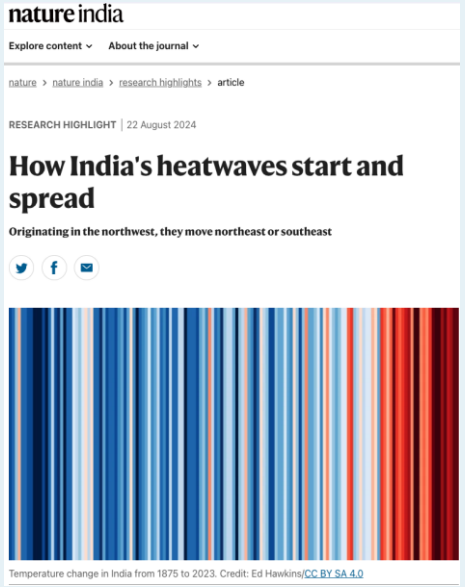
nature › nature india › research highlights › article

RESEARCH HIGHLIGHT | 04 September 2024

Needle-free COVID-19 vaccine shows potential to resist new variants

Booster candidate elicits strong, lasting T-cell response in animal models

People queue up in front of a hospital near Delhi during a COVID-19 vaccination drive. Credit: Subhra Priyadarshini



nature india

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nature › nature india › research highlights › article

RESEARCH HIGHLIGHT | 22 August 2024

How India's heatwaves start and spread

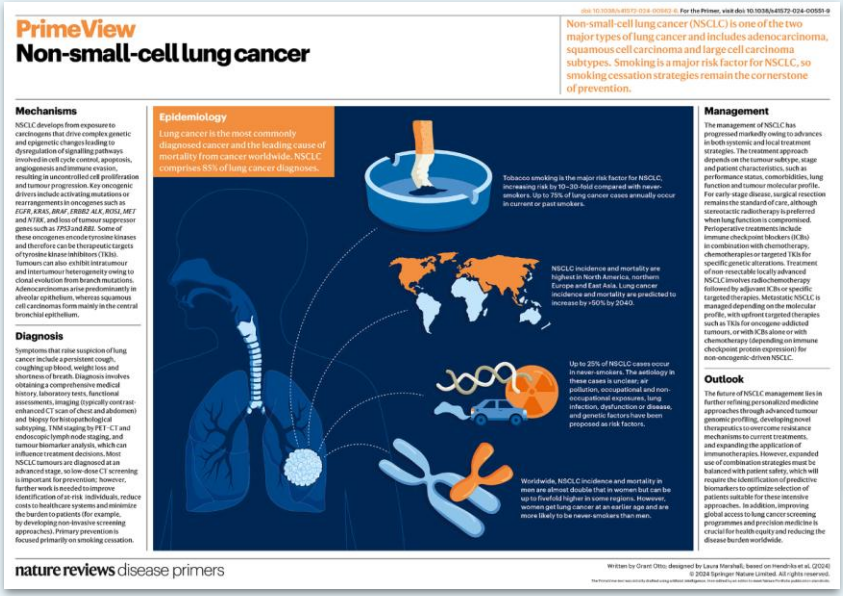
Originating in the northwest, they move northeast or southeast

Temperature change in India from 1875 to 2023. Credit: Ed Hawkins/CC BY SA 4.0

SPRINGER NATURE

PrimeView: Disease primers

PrimeView highlights the epidemiology of a disease and summarizes the mechanisms, diagnosis, management and the quality of life. *Infographics Format*



PrimeView
Non-small-cell lung cancer

Non-small-cell lung cancer (NSCLC) is one of the two major types of lung cancer and includes adenocarcinoma, squamous cell carcinoma and large cell carcinoma subtypes. Smoking is a major risk factor for NSCLC, so smoking cessation strategies remain the cornerstone of prevention.

Mechanisms

NSCLC develops from exposure to carcinogens that drive complex genetic and epigenetic changes leading to dysregulation of signalling pathways involved in cell cycle control, apoptosis, angiogenesis and immune evasion, resulting in uncontrolled cell proliferation and tumour progression. Key oncogenic drivers include activating mutations or rearrangements in oncogenes such as *EGFR*, *KRAS*, *BRAF*, *ERBB2* (*HER2*), *ALK*, *ROS1*, *MET* and *NTRK*, and loss of tumour suppressor genes such as *TP53* and *RB1*. Some of these oncogenes encode tyrosine kinases and therefore can be therapeutic targets of tyrosine kinase inhibitors (TKIs). Tumours can also exhibit intratumour and intertumour heterogeneity owing to clonal evolution from branch mutations. Adenocarcinomas arise predominantly in alveolar epithelium, whereas squamous cell carcinomas form mainly in the central bronchial epithelium.

Diagnosis

Symptoms that raise suspicion of lung cancer include a persistent cough, coughing up blood, weight loss and shortness of breath. Diagnosis involves obtaining a comprehensive medical history, laboratory tests, functional assessments, imaging (typically contrast-enhanced CT scan of chest and abdomen) and biopsy for histopathological subtyping. TNM staging by PET–CT and endoscopic lymph node staging, and tumour biomarker analysis, which can influence treatment decisions. Most NSCLC tumours are diagnosed at an advanced stage, so low-dose CT screening is important for prevention; however, further work is needed to improve identification of at-risk individuals, reduce costs to healthcare systems and minimize the burden to patients (for example, by developing non-invasive screening approaches). Primary prevention is focused primarily on smoking cessation.

Epidemiology

Lung cancer is the most commonly diagnosed cancer and the leading cause of mortality from cancer worldwide. NSCLC comprises 85% of lung cancer diagnoses.

Tobacco smoking is the major risk factor for NSCLC, increasing risk by 10–20-fold compared with never-smokers. Up to 75% of lung cancer cases annually occur in current or past smokers.

NSCLC incidence and mortality are highest in North America, northern Europe and East Asia. Lung cancer incidence and mortality are predicted to increase by >50% by 2040.

Up to 25% of NSCLC cases occur in never-smokers. The aetiology in these cases is unclear; air pollution, occupational and non-occupational exposures, lung infection, dysfunction or disease, and genetic factors have been proposed as risk factors.

Worldwide, NSCLC incidence and mortality in men are almost double that in women but can be up to fivefold higher in some regions. However, women get lung cancer at an earlier age and are more likely to be never-smokers than men.

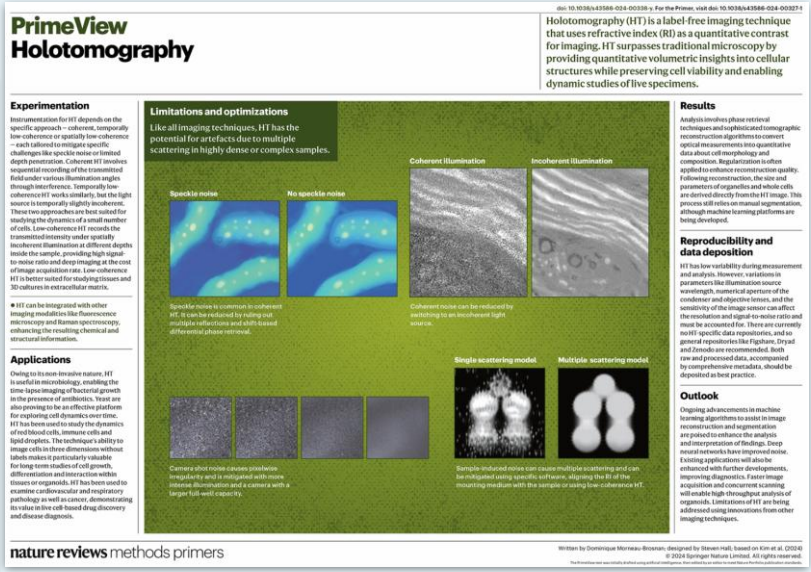
Management

The management of NSCLC has progressed markedly owing to advances in both systemic and local treatment strategies. The treatment approach depends on the tumour subtype, stage and patient characteristics, such as performance status, comorbidities, lung function and tumour molecular profile. For early-stage disease, surgical resection remains the standard of care, although stereotactic radiotherapy is preferred when lung function is compromised. Perioperative treatments include immune checkpoint blockers (ICBs) in combination with chemotherapy, chemotherapies or targeted TKIs for specific genetic alterations. Treatment of non-resectable locally advanced NSCLC involves radiochemotherapy followed by adjuvant ICBs or specific targeted therapies. Metastatic NSCLC is managed depending on the molecular profile, with upfront targeted therapies such as TKIs for oncogene-addicted tumours, or with ICBs alone or with chemotherapy (depending on immune checkpoint protein expression) for non-oncogenic-driven NSCLC.

Outlook

The future of NSCLC management lies in further refining personalized medicine approaches through advanced tumour genomic profiling, developing novel therapeutics to overcome resistance mechanisms to current treatments, and expanding the application of immunotherapies. However, expanded use of combination strategies must be balanced with patient safety, which will require the identification of predictive biomarkers to optimize selection of patients suitable for these intensive approaches. In addition, improving global access to lung cancer screening programmes and precision medicine is crucial for health-equity and reducing the disease burden worldwide.

nature reviews disease primers



PrimeView
Holotomography

Holotomography (HT) is a label-free imaging technique that uses refractive index (RI) as a quantitative contrast for imaging. HT surpasses traditional microscopy by providing quantitative volumetric insights into cellular structures while preserving cell viability and enabling dynamic studies of live specimens.

Experimentation

Instrumentation for HT depends on the specific approach – coherent, temporally low-coherence or spatially low-coherence – each tailored to mitigate specific challenges like speckle noise or limited depth penetration. Coherent HT involves sequential recording of the transmitted field under various illumination angles through interferometry. Temporally low-coherence HT works similarly, but the light source is temporally slightly incoherent. These two approaches are best suited for studying the dynamics of a small number of cells. Low-coherence HT records the transmitted intensity under spatially incoherent illumination at different depths inside the sample, providing high signal-to-noise ratio and deep imaging at the cost of image acquisition rate. Low-coherence HT is better suited for studying tissues and 3D cultures in extracellular matrix.

• HT can be integrated with other imaging modalities like fluorescence microscopy and Raman spectroscopy, enhancing the resulting chemical and structural information.

Applications

Owing to its non-invasive nature, HT is useful in microbiology, enabling the time-lapse imaging of bacterial growth in the presence of antibiotics. Yeast are also proving to be an effective platform for exploring cell dynamics over time. HT has been used to study the dynamics of red blood cells, immune cells and lipid droplets. The technique's ability to image cells in three dimensions without labels makes it particularly valuable for long-term studies of cell growth, differentiation and interaction within tissues or organoids. HT has been used to examine cardiovascular and respiratory pathology as well as cancer, demonstrating its value in live cell-based drug discovery and disease diagnosis.

Limitations and optimizations

Like all imaging techniques, HT has the potential for artefacts due to multiple scattering in highly dense or complex samples.

Speckle noise
No speckle noise
Speckle noise is common in coherent HT. It can be reduced by ruling out multiple reflections and shift-based differential phase retrieval.
Coherent illumination
Incoherent illumination
Coherent noise can be reduced by switching to an incoherent light source.
Single scattering model
Multiple scattering model
Camera shot noise causes pixelwise irregularity and is mitigated with more intense illumination and a camera with a larger full-well capacity.
Sample-induced noise can cause multiple scattering and can be mitigated using specific software, aligning the RI of the mounting medium with the sample or using low-coherence HT.

Results

Analysis involves phase retrieval techniques and sophisticated tomographic reconstruction algorithms to convert optical measurements into quantitative data about cell morphology and composition. Regularization is often applied to enhance reconstruction quality. Following reconstruction, the size and parameters of organelles and whole cells are derived directly from the HT image. This process still relies on manual segmentation, although machine learning platforms are being developed.

Reproducibility and data deposition

HT has low variability during measurement and analysis. However, variations in parameters like illumination source wavelength, numerical aperture of the condenser and objective lenses, and the sensitivity of the image sensor can affect the resolution and signal-to-noise ratio and must be accounted for. There are currently no HT-specific data repositories, and so general repositories like Figshare, Dryad and Zenodo are recommended. Both raw and processed data, accompanied by comprehensive metadata, should be deposited as best practice.

Outlook

Ongoing advancements in machine learning algorithms to assist in image reconstruction and segmentation are poised to enhance the analysis and interpretation of findings. Deep neural networks have improved noise. Existing applications will also be enhanced with further developments, improving diagnostics. Faster image acquisition and concurrent scanning will enable high-throughput analysis of organoids. Limitations of HT are being addressed using innovations from other imaging techniques.

nature reviews methods primers

SPRINGER NATURE

Plain Language Summaries: why they matter?

In the fast-paced world of medical science, **Healthcare professionals, Researchers**, are continually required to stay abreast of the latest research, treatment advancements, regulatory changes to provide the best care to their patients and to remain compliant with industry standards.

Patient Organizations & Advocates, Editors, Students, General Public looks for simple language explanations for the easy understanding about the research, treatment procedures and the key outcomes.

Our **transition to open access** means everyone can access, so it is really important that people also understand the research to avoid any miscommunication.

Research needs to be translated into praxis to make an impact and challenges like SDGs need interdisciplinary work

Current Scientific Communication Landscape

- 2.5 million+ new scientific papers published annually (avg. ~9,000 words)
- Complex technical language and statistical analyses
- Need for accessible scientific communication
- Diverse audience requirements (patients, healthcare providers, regulators)

AI-Enhanced PLS Development Strategy

Tailored Content Approach

General Public Version

- Everyday language
- Visual explanations
- Real-world applications
- Patient-relevant outcomes

Technical/HCP Version

- Clinical implications
- Statistical highlights
- Treatment comparisons
- Practice guidelines impact

Original Text

"The study demonstrated statistically significant (p<0.001) reduction in HbA1c levels with a mean decrease of 1.8% in the treatment arm versus 0.4% in the placebo group."

General Public Version

"The new medicine helped people control their blood sugar better. People taking the medicine saw their blood sugar levels improve about four times more than those taking a dummy pill."

Technical/HCP Version

"Treatment demonstrated superior glycemic control (HbA1c reduction: -1.8% vs -0.4% placebo; p<0.001), suggesting significant clinical benefit in diabetes management."

Human-AI Partnership in Medical Writing

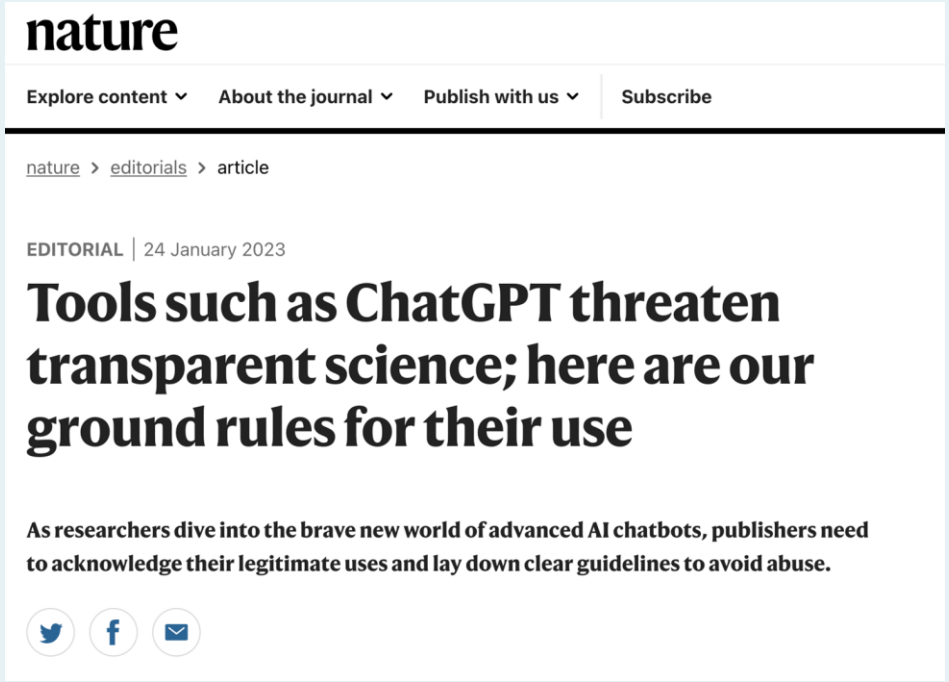
AI as an Intelligent Assistant

- Initial draft generation
- Medical terminology simplification
- Pattern recognition in scientific texts
- Consistency in terminology
- Language simplification while maintaining accuracy

Human Expertise Remains Critical

- Scientific accuracy verification
- Context understanding
- Nuanced communication
- Cultural sensitivity
- Regulatory compliance
- Responsibility and Accountability

… Authorship requires responsibility



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nature > editorials > article

EDITORIAL | 24 January 2023

Tools such as ChatGPT threaten transparent science; here are our ground rules for their use

As researchers dive into the brave new world of advanced AI chatbots, publishers need to acknowledge their legitimate uses and lay down clear guidelines to avoid abuse.

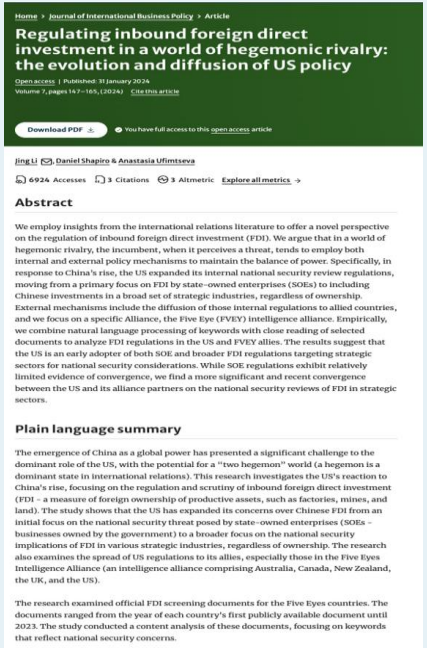
- No GenAI tool will be accepted as a credited author. This is because any attribution of authorship carries with it accountability for the work, and AI tools cannot take such responsibility.
- Authors or editors using GenAI tools should document this use in the paper.

Transparency in terms of AI usage: The text was initially drafted using artificial intelligence, then reviewed and edited by an editor to meet publication standards.

Piloted various options to include PLS: “after abstracts”

- Considered a business journal targeting corporate audiences and Policy makers
- The goal is to evaluate impact beyond traditional healthcare settings

[Example from the Journal of International Business Policy]



Home › Journal of International Business Policy › Article

Regulating inbound foreign direct investment in a world of hegemonic rivalry: the evolution and diffusion of US policy

Open access | Published: 31 January 2024
Volume 7, pages 147–165, (2024) Cite this article

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Jing Li, Daniel Shapiro & Anastasia Ufimtseva

6924 Accesses 3 Citations 3 Altmetric Explore all metrics

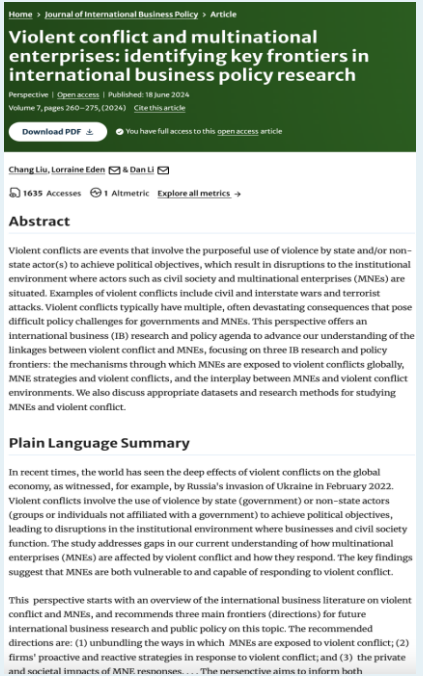
Abstract

We employ insights from the international relations literature to offer a novel perspective on the regulation of inbound foreign direct investment (FDI). We argue that in a world of hegemonic rivalry, the incumbent, when it perceives a threat, tends to employ both internal and external policy mechanisms to maintain the balance of power. Specifically, in response to China's rise, the US expanded its internal national security review regulations, moving from a primary focus on FDI by state-owned enterprises (SOEs) to including Chinese investments in a broad set of strategic industries, regardless of ownership. External mechanisms include the diffusion of those internal regulations to allied countries, and we focus on a specific Alliance, the Five Eye (FVEY) intelligence alliance. Empirically, we combine natural language processing of keywords with close reading of selected documents to analyze FDI regulations in the US and FVEY allies. The results suggest that the US is an early adopter of both SOE and broader FDI regulations targeting strategic sectors for national security considerations. While SOE regulations exhibit relatively limited evidence of convergence, we find a more significant and recent convergence between the US and its alliance partners on the national security reviews of FDI in strategic sectors.

Plain language summary

The emergence of China as a global power has presented a significant challenge to the dominant role of the US, with the potential for a "two hegemon" world (a hegemon is a dominant state in international relations). This research investigates the US's reaction to China's rise, focusing on the regulation and scrutiny of inbound foreign direct investment (FDI – a measure of foreign ownership of productive assets, such as factories, mines, and land). The study shows that the US has expanded its concerns over Chinese FDI from an initial focus on the national security threat posed by state-owned enterprises (SOEs – businesses owned by the government) to a broader focus on the national security implications of FDI in various strategic industries, regardless of ownership. The research also examines the spread of US regulations to its allies, especially those in the Five Eyes Intelligence Alliance (an intelligence alliance comprising Australia, Canada, New Zealand, the UK, and the US).

The research examined official FDI screening documents for the Five Eyes countries. The documents ranged from the year of each country's first publicly available document until 2023. The study conducted a content analysis of these documents, focusing on keywords that reflect national security concerns.



Home › Journal of International Business Policy › Article

Violent conflict and multinational enterprises: identifying key frontiers in international business policy research

Perspective | Open access | Published: 18 June 2024
Volume 7, pages 260–275, (2024) Cite this article

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Chang Liu, Lorraine Eden & Dan Li

1635 Accesses 1 Altmetric Explore all metrics

Abstract

Violent conflicts are events that involve the purposeful use of violence by state and/or non-state actor(s) to achieve political objectives, which result in disruptions to the institutional environment where actors such as civil society and multinational enterprises (MNEs) are situated. Examples of violent conflicts include civil and interstate wars and terrorist attacks. Violent conflicts typically have multiple, often devastating consequences that pose difficult policy challenges for governments and MNEs. This perspective offers an international business (IB) research and policy agenda to advance our understanding of the linkages between violent conflict and MNEs, focusing on three IB research and policy frontiers: the mechanisms through which MNEs are exposed to violent conflicts globally, MNE strategies and violent conflicts, and the interplay between MNEs and violent conflict environments. We also discuss appropriate datasets and research methods for studying MNEs and violent conflict.

Plain Language Summary

In recent times, the world has seen the deep effects of violent conflicts on the global economy, as witnessed, for example, by Russia's invasion of Ukraine in February 2022. Violent conflicts involve the use of violence by state (government) or non-state actors (groups or individuals not affiliated with a government) to achieve political objectives, leading to disruptions in the institutional environment where businesses and civil society function. The study addresses gaps in our current understanding of how multinational enterprises (MNEs) are affected by violent conflict and how they respond. The key findings suggest that MNEs are both vulnerable to and capable of responding to violent conflict.

This perspective starts with an overview of the international business literature on violent conflict and MNEs, and recommends three main frontiers (directions) for future international business research and public policy on this topic. The recommended directions are: (1) unbundling the ways in which MNEs are exposed to violent conflict; (2) firms' proactive and reactive strategies in response to violent conflict; and (3) the private and societal impacts of MNE responses. . . . The perspective aims to inform both

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FTO-mediated SMAD2 m6A modification protects cartilage against Osteoarthritis

Hongyi Zhou, Ziang Xie, Yu Qian, Weiyu Ni, Lei Cui, Xiangqian Fang, Shuanglin Wan, Xiangde Zhao, An Qin, Shunwu Fan & Yizheng Wu

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Abstract

N6-methyladenosine (m6A) modification is one of the most prevalent forms of epigenetic modification and plays an important role in the development of degenerative diseases such as osteoarthritis (OA). However, the evidence concerning the role of m6A modification in OA is insufficient. Here, m6A modification was increased in human OA cartilage and degenerated chondrocytes. Among all of the m6A enzymes, the expression of the demethylase fat mass and obesity-associated protein (FTO) decreased dramatically. Conditional knockout of FTO in chondrocytes accelerates OA progression. FTO transcription is regulated by runt-related transcription factor-1 (RUNX1). Reduced FTO elevates m6A modification at the adenosine N6 position in SMAD family member 2 (SMAD2) mRNA, whose stability is subsequently modulated by the recruited m6A reader protein YTH N6-methyladenosine RNA binding protein F2 (YTHDF2). Collectively, these findings reveal the function and mechanism of the m6A family member FTO in OA progression. Therefore, reducing m6A modification to increase SMAD2 stability by activating FTO might be a potential therapeutic strategy for OA treatment.

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Editorial Summary

Epigenetic insights: FTO's role in osteoarthritis progression

Osteoarthritis is a widespread joint disease-causing pain and disability. It involves the deterioration of joint cartilage and bone, but the exact reasons are unclear. This study aimed to investigate the role of a specific change in RNA molecules, called N6-methyladenosine, in OA development. The researchers focused on the enzyme FTO, which can remove this change, and its effect on cartilage cells in mice. They used different methods, including genetic modification to create mice lacking FTO in their cartilage cells, to see how changes in m6A levels affect OA progression. The main findings show that reducing FTO expression worsens OA progression by affecting the stability and function of specific RNA molecules in cartilage cells. The researchers conclude that targeting the m6A change pathway, especially by modulating FTO activity, could provide new treatment strategies for OA.

This summary was initially drafted using artificial intelligence, then revised and fact-checked by the author.

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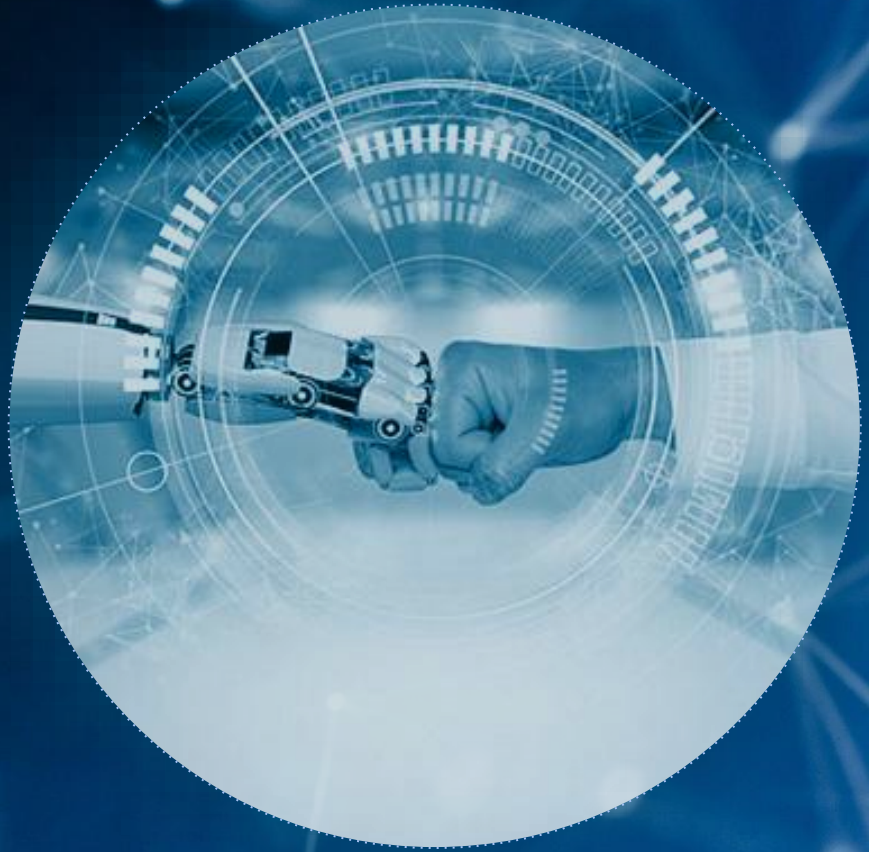
… for Pharma and Healthcare

Bronchopulmonary dysplasia (BPD) is a chronic lung disease affecting very premature infants, characterized by lung inflammation and impaired lung development. Chronic obstructive pulmonary disease (COPD) in older adults shares similar inflammatory features and can be linked to early life factors like maternal smoking and premature birth. Both conditions involve neutrophilic inflammation, where neutrophils are a type of white blood cell, and increased protease activity, which can damage lung tissue. The study explores how the lung microbiota, particularly Lactobacillus bacteria, might influence this inflammation and offers a potential therapeutic approach using a live biotherapeutic product (LBP) containing Lactobacillus strains.

This article investigates the role of Lactobacillus bacteria in reducing lung inflammation in BPD and COPD. Researchers used various models, including cell cultures, mouse models, and humanized models, to test the effects of a Lactobacillus-based LBP. They engineered this product for inhalation to target the lungs directly. The study identified L lactic acid, a byproduct of Lactobacillus, as an active component that reduces inflammation. The researchers also explored the mechanisms by which these bacteria might reduce neutrophilic inflammation and improve lung structure.

The study found that infants with severe BPD had decreased levels of Lactobacilli and increased markers of inflammation in their airways. In mouse models, treatment with the Lactobacillus LBP reduced neutrophilic inflammation and improved lung structure. The LBP was also effective in COPD models, showing anti-inflammatory effects comparable to steroids but with potentially fewer side effects. The findings suggest that inhaled Lactobacillus-based therapies could offer a new approach to managing chronic lung diseases like BPD and COPD by reducing inflammation and protecting lung tissue. This research highlights the potential of using beneficial bacteria as a therapeutic strategy for these conditions, providing a foundation for future clinical trials in humans.



Thank you

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