Patient Wellness First

BioSciTech biweekly NEWS

Issue: 15 March 2025

NEWS & COMMENTARIES

Safeguarding the future of biomedical science in the United States

Tom Maniatis

https://www.cell.com/cell/fulltext/S0092-8674(25)00212-0

NIH's abrupt decision to cap indirect cost reimbursement at 15% threatens the critical infrastructure supporting groundbreaking biomedical research in the United States. This policy jeopardizes America's global leadership in science and medicine. Urgent action is needed to advocate for its immediate and permanent reversal to protect the future of science.

Research, funded in large part by the National Institutes of Health (NIH), has positioned the United States as a global leader in biomedical science and technology and transformed the landscape of healthcare, engineering, and computer science. For every dollar the NIH has invested in biomedical research, the US has seen an estimated $2.46 increase in new economic activity

Exclusive: NIH to terminate hundreds of active research grants

By Max Kozlov & Smriti Mallapaty

https://www.nature.com/articles/d41586-025-00703-1

Studies that touch on LGBT+ health, gender identity and DEI in the biomedical workforce could be terminated, according to documents obtained by Nature.

In an unprecedented move, the US National Institutes of Health (NIH) has begun a mass termination of research grants that fund active scientific projects because they no longer meet "agency priorities".

Bayer announced that the U.S. Food and Drug Administration (FDA) has granted Fast Track designation for OpCT-001, an investigational induced pluripotent stem cell (iPSC)-derived cell therapy being tested in a Phase 1/2a clinical trial for the treatment of primary photoreceptor diseases.

read the full release on bluerocktx.com

https://www.bluerocktx.com/bluerock-therapeutics-receives-fda-fast-track-designation-for-opct-001-for-the-treatment-of-primary-photoreceptor-diseases/

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Bankruptcy, Genetic Information, and Privacy — Selling Personal Information

Sara Gerke et al., 2025

Questions about the future of 23andMe underscore the challenges inherent to a legal system that relies on privacy policies to protect consumer data, while also treating those data as a valuable asset.

Interview with Sara Gerke on the potential for genetic data and other personal information to be included in business transactions in the United States

Listen to Video:

https://www.nejm.org/doi/full/10.1056/NEJMp2415835

Rethinking postdoc careers through the science of science

Wu Youyou and Kaiyun Feng, 2025

https://doi.org/10.1073/pnas.250034412

Postdocs are referred to as the invisible scholars (1). Their position in academia is ambiguous and overlooked, except perhaps when a university aims to inflate its number of Nobel laureates by claiming former postdoctoral researchers.

The invisibility of postdocs is unfortunately mirrored in the field of Science of Science, a field situated at the intersection of data science and the study of the scientific enterprise. The field's key goals include "enhancing career paths for scientists" as outlined in their landmark review paper. While it has made notable progress in mapping out career dynamics [see Wang and Barabási's book for a review (2)], the study of postdocs as a career stage has yet to catch the wave of the quantitative Science of Science approach.

SELECTED PUBLICATIONS

GenAI synthetic data create ethical challenges for scientists. Here's how to address them.

David B. Resnik et al., 2025

https://doi.org/10.1073/pnas.2409182122

Synthetic data have been used in science for decades, but advancements in generative AI (GenAI) have significantly expanded their applications. These data help address missing information, correct biases, model complex phenomena, validate research tools, and protect sensitive information. However, alongside these benefits, GenAI-generated synthetic data raise ethical concerns that must be managed to maximise their potential while minimizing risks to science and society.

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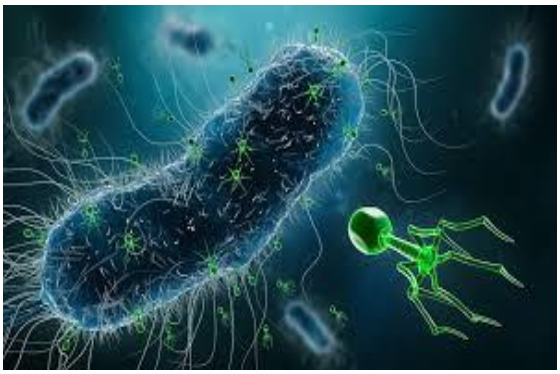


Bacteriophage therapy for multidrug-resistant infections: current technologies and therapeutic approaches

Kim et al., 2025

https://doi.org/10.1172/JCI187996.

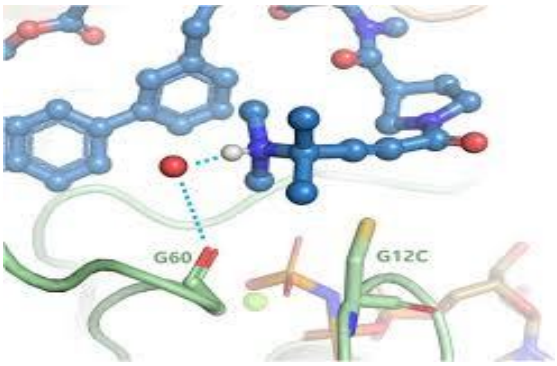
Phage therapy offers a promising solution for multidrug-resistant (MDR) infections, with international centres actively exploring its clinical applications. While personalised phage therapy has shown success, challenges remain for broader adoption. This review outlines key stages in phage therapy development, from phage selection to clinical trials, highlighting gaps in formulation, pharmacology, and cocktail design. A structured drug development framework and government support are essential for its widespread clinical implementation.

Multimodal single-cell analyses reveal molecular markers of neuronal senescence in human drug-resistant epilepsy

Ge et al., 2025

https://doi.org/10.1172/JCI188942

Histopathological neurons in drug-resistant epilepsy show structural abnormalities, but their gene expression changes remain unclear. Using single-cell RNA sequencing and electrophysiology, we identified a subset of cortical pyramidal neurons expressing senescence-related genes linked to inflammation and mTOR signaling. These markers were validated in human brain tissue and mouse models, suggesting neuronal senescence as a key factor in epilepsy pathology and potential therapeutic target.



Discovery of Elironrasib (RMC-6291), a Potent and Orally Bioavailable, RAS(ON) G12C-Selective, Covalent Tricomplex Inhibitor for the Treatment of Patients with RAS G12C-Addicted Cancers

Cregg et al., 2025

https://doi.org/10.1021/acs.jmedchem.4c02313

Elironrasib (RMC-6291) represents a breakthrough in targeting the active RAS(ON) state of KRASG12C, previously considered undruggable. This novel tricomplex inhibitor leverages intracellular chaperone proteins to selectively inhibit oncogenic signaling, leading to tumor regression in preclinical models. Currently in phase 1 trials, early results suggest clinical efficacy in patients resistant to first-generation KRASG12C inhibitors.

By Dr. M.Boudjelal (KAIMRC), Dr. M. Belhocine (AGU), Dr. F. Amokrane Nait Mohamed (Harvard), Dr. Bilal Djeghout (Quadram Institute)

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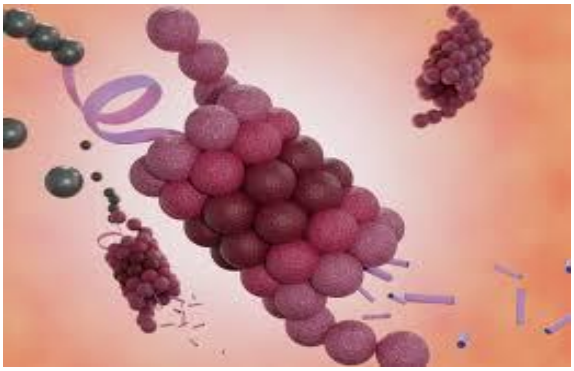
Tirzepatide for Obesity Treatment and Diabetes Prevention

Jastreboff et al., 2025

https://doi.org/10.1056/NEJMoa241081

Obesity is a key driver of type 2 diabetes, and tirzepatide has demonstrated significant weight reduction in previous trials. In this 3-year study, individuals with obesity and prediabetes received tirzepatide or placebo, with sustained weight loss and delayed diabetes onset observed. The findings support tirzepatide as an effective long-term intervention for both obesity and diabetes prevention.

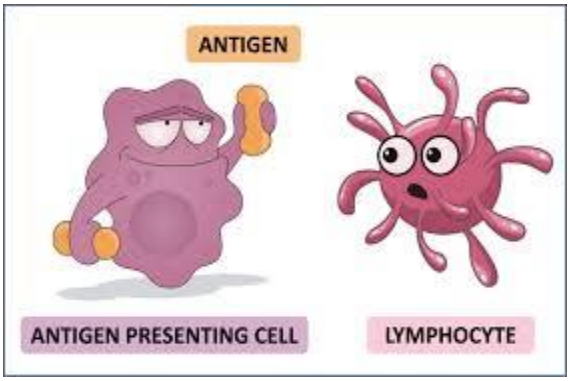


An engineered cereblon optimized for high-throughput screening and molecular glue discovery

Bailey et al., 2025

https://doi.org/10.1016/j.chembiol.2024.11.002

The untapped potential for the discovery of molecular glue substrates leaves huge potential for exciting developments in this field. Through simplification of CRBN production and optimization of multiple biophysics and biochemical assays to measure ternary complex formation, we hope to provide improved resources for the validation and characterization of CRBN-based degraders. We show this applicability here through development of the “Enamine CRBN focused IMiD library” of 4480-IMiD based derivatives and application of our CRBN construct in high-throughput screening for the discovery of next generation binders. Importantly, our CRBN-based assays also extend to the cellular context allowing further assessment of CRBN binder interactomes by mass spectrometry providing exciting tools for target validation and specificity profiling. Taken together, we believe combining our IMiD based chemical binding landscape and “binding first” interactome screening approach with existing protein degradation profiling tools will have high potential to accelerate the future discovery of next generation CRBN glue substrates and degrader molecules.



RORγt-expressing dendritic cells are functionally versatile and evolutionarily conserved antigen-presenting cells

Narasimhan et al., 2025

https://doi.org/10.1073/pnas.2417308122

Conventional dendritic cells (cDCs) play a crucial role in directing immune responses, making them promising targets for vaccines, autoimmune therapies, and cancer treatment. This study identifies RORγt+ DCs as a conserved and functionally distinct subset with the ability to migrate, activate naïve CD4+ T cells, and respond to inflammation. While previously linked to immune tolerance, RORγt+ DCs also exhibit proinflammatory functions in autoimmune neuroinflammation.

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Mass-spectrometry-based proteomics: from single cells to clinical applications

Tiannan Guo, Judith A. Steen & Matthias Mann, 2025

https://doi.org/10.1038/s41586-025-08584-0

Mass spectrometry-based proteomics has rapidly evolved, enabling unprecedented insights into biological systems. Recent advancements in sensitivity now allow for single-cell proteomics and spatial tissue profiling, while improvements in throughput and robustness are driving clinical applications. This review highlights cutting-edge developments in sample preparation, instrumentation, and data acquisition, alongside the growing role of AI in accelerating analysis. With applications ranging from protein interactions to biomarker discovery, proteomics is transitioning from basic research to clinical diagnostics, holding immense potential to revolutionize biology and medicine.

Identification of blood plasma protein ratios for distinguishing Alzheimer's disease from healthy controls using machine learning

Safia et al., 2025

https://doi.org/10.1016/j.heliyon.2025.e42349

Early diagnosis of Alzheimer’s disease is key to improving treatment and disease management. This study explores liquid biopsy techniques, leveraging plasma proteomics to identify novel biomarkers. Analyzing plasma samples from Alzheimer's patients and healthy individuals, researchers identified 82 differentially expressed proteins and calculated protein ratios with high diagnostic accuracy. Key ratios, such as kynureninase to macrophage scavenger receptor type 1, achieved up to 98% accuracy in distinguishing Alzheimer’s patients from healthy controls. These findings highlight the potential of plasma-based diagnostics as a noninvasive and precise tool for early Alzheimer’s detection and monitoring.

Aspirin prevents metastasis by limiting platelet TXA2 suppression of T cell immunity

Jie Yang et al., 2025

https://www.nature.com/articles/s41586-025-08626-7

Metastasis is responsible for 90% of cancer-related deaths, and targeting its immune vulnerabilities could improve patient outcomes. A new study reveals that inhibitors of cyclooxygenase 1 (COX-1), including aspirin, enhance immune responses against metastasizing cancer cells. Researchers found that platelet-derived thromboxane A2 (TXA2) suppresses T cell activation via ARHGEF1, limiting their ability to attack metastatic cells. Blocking TXA2—either through aspirin, selective COX-1 inhibitors, or platelet-specific COX-1 deletion—releases T cells from suppression, reducing metastasis.

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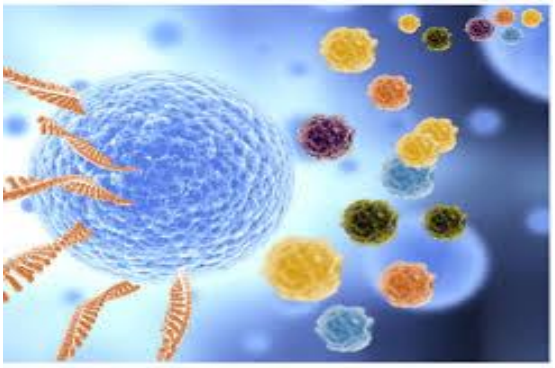

A multiplex single-cell RNA-Seq pharmacotranscriptomics pipeline for drug discovery

Dini et al., 2025

https://www.nature.com/articles/s41589-024-01761-8

Understanding how cancer cells respond to drugs at a gene-regulatory level is crucial for improving treatments. A new study presents a high-throughput pharmacotranscriptomic pipeline that integrates live-cell barcoding and single-cell RNA sequencing to analyze drug responses. Applied to high-grade serous ovarian cancer (HGSOC), this approach revealed that certain PI3K–AKT–mTOR inhibitors trigger a resistance mechanism via EGFR activation, mediated by CAV1 upregulation. Targeting both pathways simultaneously overcomes this resistance, highlighting a potential strategy for personalized cancer therapy. This workflow offers a powerful tool for tailoring treatments based on patient-derived tumor samples at single-cell resolution.

Cell Painting: a decade of discovery and innovation in cellular imaging

Srijit Seal et al., 2025

https://doi.org/10.1038/s41592-024-02528-8

Over the past decade, Cell Painting has revolutionized image-based profiling by capturing rich cellular information beyond traditional high-content screening methods. This microscopy-based assay, introduced in 2013, has evolved through protocol optimizations, expanded applications, and improved computational methods for feature extraction and batch-effect correction. Its versatility allows researchers to analyze cellular responses to various perturbations, aiding in drug discovery, toxicity assessment, and mechanism-of-action studies. Future advancements will likely focus on integrating Cell Painting with other -omics data and leveraging AI-driven analytics to further enhance its impact on biomedical research

RECOMMENDED EVENTS

International course Integrative Structural Biology Meets Drug Discovery.

The course will be held on the Brazilian Center for Research in Energy and Materials (CNPEM) of 19-23/05 with expert instructors in the different areas of drug discovery and structural biology.

https://pages.cnpem.br/isbdd/

By Dr. M.Boudjelal (KAIMRC), Dr. M. Belhocine (AGU), Dr. F. Amokrane Nait Mohamed (Harvard), Dr. Bilal Djeghout (Quadram Institute)

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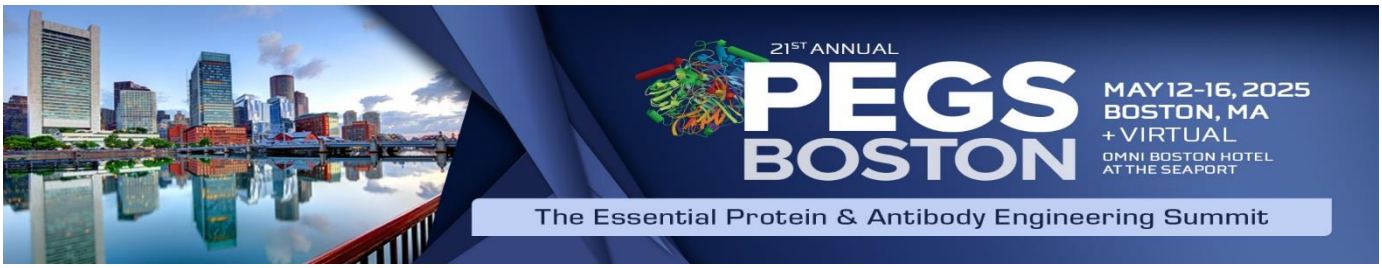
AstraZeneca Young Health Program Impact Fellowship | 2025

Are you a passionate young leader actively involved in advocating for greater health equity within your community?
Are you leading projects within a registered non-profit organisation?
Are you ready to be part of a global network with other young people who are creating positive change for the future?
https://www.oneyoungworld.com/scholarships/astrazeneca-yhp/2025

BRITISH PHARMACOLOGICAL SOCIETY

eLearning Project Coordinator
Greater London, England, United Kingdom

This is an exciting opportunity to lead the development of an innovative eLearning platform and training modules aimed at educating regulatory professionals in pharmacogenomics and regulatory pathways. As part of an Innovate UK funded initiative to establish a Centre for Excellence in Regulatory Science and Innovation in Pharmacogenomics (CERSI-PGx), you will work closely with partners from the University of Liverpool, Queen Mary University of London, and other key academic and industry experts to explore integrating pharmacogenomics into clinical practice.
https://www.linkedin.com/jobs/view/4181166468/?refId=%2BiDtYUpTmYuTOrYQNvKbBQ%3D%3D&trackingId=%2BiDtYUpTmYuTOrYQNvKbBQ%3D%3D



WORKFORCE INNOVATION BREAKFAST PANEL AT PEGS BOSTON SUMMIT

Wednesday, May 14 at 7:30am

Start your morning at PEGS Boston Summit with an engaging discussion on Workforce Transformation: An Evolving Approach to Achieve Innovation, co-organized with Thinkubator Media. Enjoy a complimentary continental breakfast while industry leaders examine the evolving role of DEI in shaping the workforce.
https://www.pegsummit.com/

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PhD in Biomedical Science

The proposed PhD program in Biomedical Sciences is under review by the Commission for Academic Accreditation (CAA).
https://www.ku.ac.ae/program/phd-in-biomedical-science

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