Patient Wellness First

BioSciTech biweekly NEWS

Issue: 15 February 2025

NEWS & COMMENTARIES

Cancer vaccine prevents recurrence of advanced kidney cancer in small trial

By Darren Incorvaia Feb 6, 2025

After their advanced kidney tumors were surgically removed, nine patients were protected from the cancer returning thanks to an experimental, personalized cancer vaccine. The small, phase 1 trial was carried out by the Dana-Farber Cancer Institute, with the results published in Nature "A neoantigen vaccine generates antitumour immunity in renal cell carcinoma

https://www.fiercebiotech.com/biotech/cancer-vaccine-prevents-recurrence-advanced-kidney-cancer-small-trial

Access to the top cited paper in 2024

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https://www.cell.com/the-innovation/collections/top-cited-2024-papers?dgcid=STMJ_1738583860_CP_ALT&utm_campaign=The%20Innovation&utm_medium=email&_hsenc=p2ANqtz-_IfsGeebzXEHvcDax3MbwjcJkaA1h8m8w76mKI19O7Ofc9pcLXBnqTjoWfJLOf_sbj6M_UJBEHRWIeo3sdcPau_DjiuQ&_hsmi=345836972&utm_content=345837637&utm_source=hs_email

genomeweb
A CRAIN FAMILY BRAND

Diatech Pharmacogenetics, Merck KGaA Expand RAS Biomarker Testing Pact in Middle East, Africa

Jan 29, 2025 | staff reporter

Diatech Pharmacogenetics said Wednesday that it has expanded an existing collaboration with Merck KGaA affiliate Merck Serono Middle East to improve patient access to RAS biomarker testing in the Middle East and Africa regions. Italy-based Diatech's solid-tumor CE-IVD sequencing kits allow quick and accurate detection of biomarkers that can inform personalized care for patients — in this case, those with colorectal cancer. Targeted therapies are now available for colorectal tumors with alterations in genes like KRAS and NRAS, but patients must be tested for these markers to be eligible.

https://www.genomeweb.com/cancer/diatech-pharmacogenetics-merck-kgaa-expand-ras-biomarker-testing-pact-middle-east-africa

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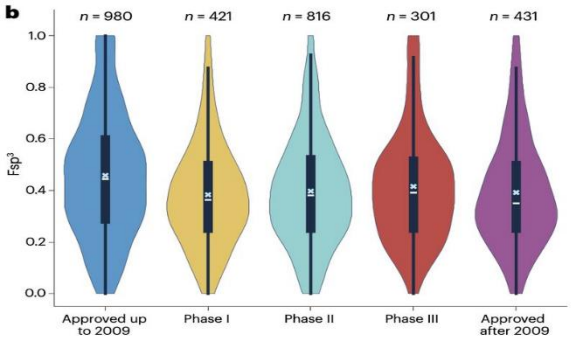
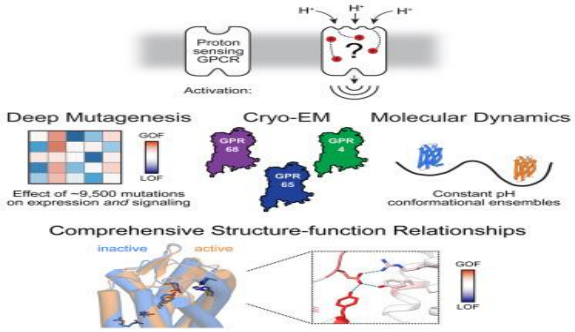
SELECTED PUBLICATIONS



Drug discovery: Return to Flatland

Ian Churcher, Stuart Newbold & Christopher W. Murray

Fifteen years ago, an influential analysis suggested that drug molecules with greater three-dimensional character had a higher likelihood of success in clinical development. But has this trend held up over time? In a new study, researchers revisit this landmark finding, analyzing how drug design has evolved and assessing the impact of that initial publication. Has the push for increased molecular complexity translated into improved clinical outcomes? Explore the latest insights into the shifting landscape of drug discovery and development. **https://doi.org/10.1038/s41570-025-00688-5**

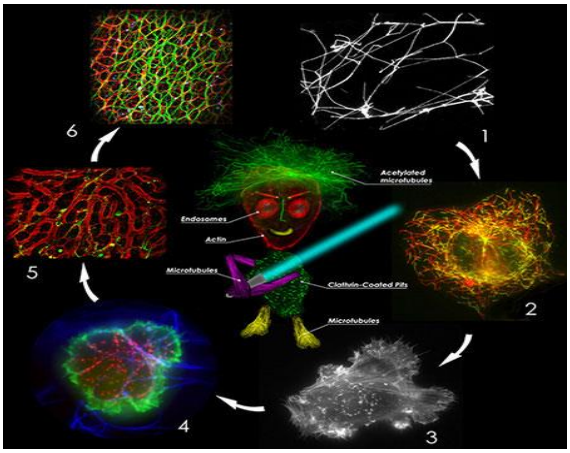


Molecular basis of proton sensing by G protein-coupled receptors

Howard et al., 2025

https://doi.org/10.1016/j.cell.2024.11.036

How do cells detect and respond to changes in pH? Three proton-sensing GPCRs—GPR4, GPR65, and GPR68—play key roles in regulating diverse physiological processes, but their activation mechanisms remain unclear. Now, researchers have mapped the structural and functional landscape of these receptors using cryo-EM, deep mutational scanning (~9,500 mutants!), and constant-pH molecular dynamics. Surprisingly, proton sensing doesn't rely on a single critical site but rather a network of titratable residues spanning the receptor. This integrative approach sheds new light on GPCR signaling complexity and could inform future drug discovery efforts.



The impact of glucocorticoid receptor transactivation on context-dependent cell migration dynamics

Szonja Polett Pósa et al., 2025

https://doi.org/10.1038/s41598-025-88666-1

GR signaling affects breast cancer differently based on estrogen receptor (ER) status. In triple-negative (TN) cells, GR activation boosts migration and proliferation, while in ER+ cells, it slows proliferation. Transcriptome analysis links GR activity to cell adhesion, extracellular matrix signaling, and migration. These findings suggest GR influences cancer progression in an ER-dependent manner, with implications for prognosis and treatment.

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

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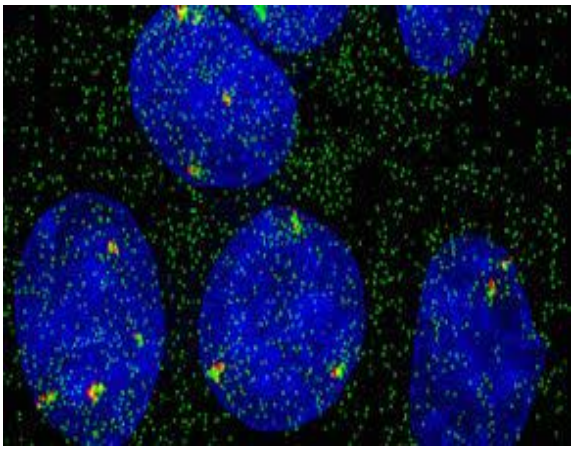
Distinctive blood and salivary proteomics signatures in Qatari individuals at high risk for cardiovascular disease

Ghada Yousif et al., 2025

https://doi.org/10.1038/s41598-025-87596-2

Cardiovascular disease (CVD) remains a major global health challenge, and early detection is key to prevention. This study explores saliva as a diagnostic tool by comparing the salivary and plasma proteomes of individuals at high and low CVD risk. Using large-scale proteomic analysis, researchers identified distinct protein signatures linked to immune activation and extracellular matrix remodeling in high-risk individuals. Notably, eight biomarkers were shared between saliva and plasma, highlighting saliva's potential for non-invasive CVD risk assessment. Further validation could pave the way for a simple, accessible diagnostic tool.

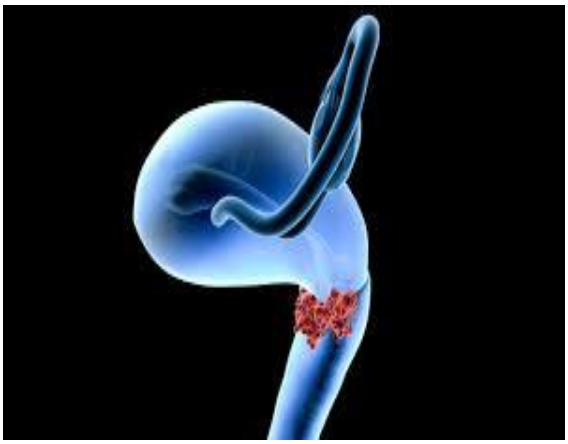


AI-based prediction of androgen receptor expression and its prognostic significance in prostate cancer

Jiawei Zhang et al., 2025

https://doi.org/10.1038/s41598-025-88199-7

Biochemical recurrence (BCR) of prostate cancer affects post-surgery quality of life, but current predictive models lack accuracy. This study introduces a deep learning-based AI model that analyzes androgen receptor (AR) features in whole-slide images to improve BCR prediction. Trained on data from 545 patients, the model accurately identifies high AR expression regions and high-risk patients.



Investigating new drugs from marine seaweed metabolites for cervical cancer therapy by molecular dynamic modeling approach

Sk Injamamul Islam et al., 2025

https://doi.org/10.1038/s41598-024-82043-0

With HPV-driven cervical cancer posing a global health challenge, especially in low-resource settings, researchers are exploring marine seaweed compounds as potential treatments. Using high-throughput virtual screening and molecular analysis, three promising drug-like candidates—BC008, RL379, and BC014—were identified for their ability to inhibit the E6 oncoprotein. These compounds demonstrated strong binding affinity, stability, and favorable pharmacokinetic properties, suggesting their potential as cost-effective anticancer therapies. This study lays the groundwork for future drug development targeting cervical cancer.

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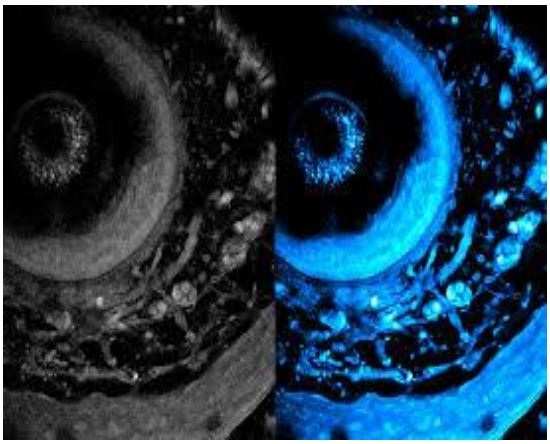
Plasma proteomic evidence for increased β-amyloid pathology after SARS-CoV-2 infection

Eugene P. Duff et al., 2025

https://www.nature.com/articles/s41591-024-03426-4

investigated whether SARS-CoV-2 infection is associated with Alzheimer's disease-related biomarkers using UK Biobank plasma samples before and after confirmed infections. Findings indicated that SARS-CoV-2 infection correlated with a reduced plasma Aβ42:Aβ40 ratio and, in vulnerable individuals, lower Aβ42 levels and increased pTau-181. These changes were more pronounced in hospitalized patients and those with a history of hypertension. Additionally, the observed biomarker shifts aligned with brain structural imaging changes linked to Alzheimer's disease, cognitive decline, and poorer health assessments.

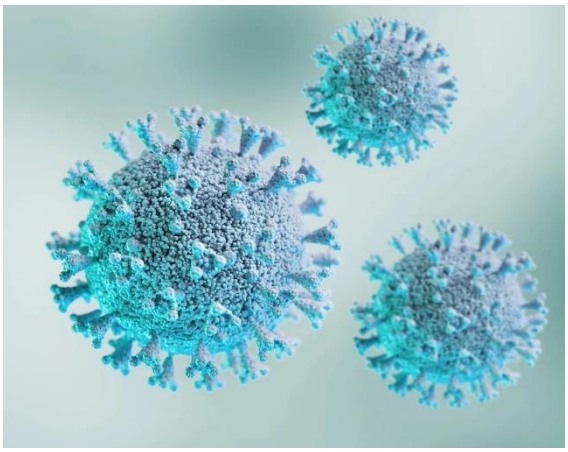


A thermoplastic chip for 2D and 3D correlative assays combining screening and high-resolution imaging of immune cell responses

Hanna van Ooijen et al., 2025

https://doi.org/10.1016/j.crmeth.2025.100965

This study introduces a disposable thermoplastic microwell chip designed for screening and high-resolution imaging of single-cell behavior in both 2D and 3D cultures. The chip demonstrates superior optical properties and enables prolonged culture of both suspension and adherent cells, including uniform spheroids. The system allows for single-cell analysis by correlating the dynamic cytotoxic response of immune cells to intracellular cytolytic load. Additionally, it supports highly multiplexed cytotoxicity screening of tumor spheroids, assessing the influence of tumor microenvironmental factors on natural killer (NK) cell-mediated cytotoxicity.



Small-molecule inhibition of SARS-CoV-2 NSP14 RNA cap methyltransferase

Cindy Meyer et al., 2025

https://www.nature.com/articles/s41586-024-08320-0

This research focuses on the discovery and development of a first-in-class small-molecule inhibitor targeting the SARS-CoV-2 NSP14 guanine-N7 methyltransferase (MTase). High-throughput screening identified RU-0415529, which inhibits NSP14 by forming a ternary complex with S-adenosylhomocysteine. Further optimization led to TDI-015051, a potent inhibitor with a dissociation constant (Kd) of 61 pM and an EC50 of 11 nM, effectively suppressing viral replication in primary airway epithelial cells and a transgenic mouse model. The study highlights the potential of viral cap methylase inhibition as an antiviral strategy applicable to other pandemic viruses.

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

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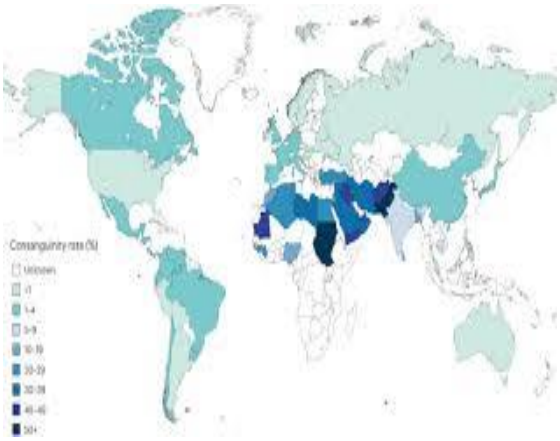
Liver X receptor unlinks intestinal regeneration and tumorigenesis

Srustidhar Das et al., 2025

https://www.nature.com/articles/s41586-024-08247-6

The intestinal epithelium requires precise control during tissue renewal to prevent neoplastic transformation. This study identifies the activation of the liver X receptor (LXR) pathway as a mechanism that balances regeneration and tumorigenesis. Single-cell RNA sequencing, intestinal organoid studies, and genetic models revealed that LXR activation enhances regenerative responses by inducing amphiregulin (Areg) production in epithelial cells. The enzyme CYP27A1, which produces LXR ligands, was upregulated in damaged intestinal crypts. Deleting Cyp27a1 impaired regeneration but could be rescued with LXR agonists. In tumor models, CYP27A1 deficiency promoted tumor growth, while LXR activation triggered anti-tumor immunity.



Genomics of rare diseases in the Greater Middle East

Ikram Chekroun et al., 2025

https://doi.org/10.1038/s41588-025-02075-8

The Greater Middle East (GME) is home to extraordinary genetic diversity, characterized by unique alleles, founder mutations, and high consanguinity rates, making it a valuable resource for Mendelian disease research. However, significant challenges hinder the collection and analysis of genomic data in the region. This paper highlights the GME as a natural hub for genetic discovery and underscores the need for strategic investments and inclusive research initiatives.

A Machine Learning-Based Model to Predict Intravenous Immunoglobulin Resistance in Kawasaki Disease

Yuhan Xia et al., 2025

https://doi.org/10.1016/j.isci.2025.112004

This study aimed to develop a predictive model for intravenous immunoglobulin (IVIG) resistance in Kawasaki disease patients using machine learning. Six different models were constructed and validated using cross-validation and external datasets. The random forest model demonstrated the best performance, with high predictive accuracy. Key predictors identified through SHapley Additive exPlanation analysis included the C-reactive protein-to-albumin ratio, prognostic nutritional index, and sex. The model offers a reliable approach for assessing IVIG resistance, potentially improving patient management and treatment outcomes.

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RECOMMENDED EVENTS

Discover the latest trends and opportunities at CPHI Japan 2025

The NOSTER&*Science* Microbiome Prize is an international award that recognizes innovative research by investigators who received their M.D., Ph.D, or M.D/Ph.D. in the last ten years, and are working on the functional attributes of the microbiota. The research can include any organism that has potential to contribute to our understanding of human or veterinary health and disease, or to guide therapeutic interventions. The winner and finalists will be chosen by a committee of independent scientists, chaired by a senior editor at *Science.* The first prize includes a USD 25,000 cash award, an online subscription to *Science*

https://www.science.org/content/page/noster-science-microbiome-prize

The CRISPRMED25

April 7th, 2025 - CRISPRMED25 Virtual Event (April 7th, 3:00 - 6:00 PM CEST

April 8th - 11th, 2025 - CRISPRMED25 In-person Scientific Conference (

April 8th, 2025 - Founders´ Breakfast (April 8th, 9:00 - 1:00 PM CEST).

https://event.fourwaves.com/crisprmed25/registration

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

THE SPRINGTIME PARTNERING EVENT

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https://informaconnect.com/bioeurope-spring/booking-options/

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- Core Facilities and Open Science
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non exhaustive list.

https://www.ctls2025.com/

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Bio-IT World Conference & Expo is pleased to present Pharmaceutical R&D Informatics

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https://register.cambridgeinnovationinstitute.com/reg/bit

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Start: 17. March 2025 End: 21. March 2025

https://gerbi-gmb.de/event/tim2025/

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