Patient Wellness First

BioSciTech biweekly NEWS

Issue: 15 November 2024

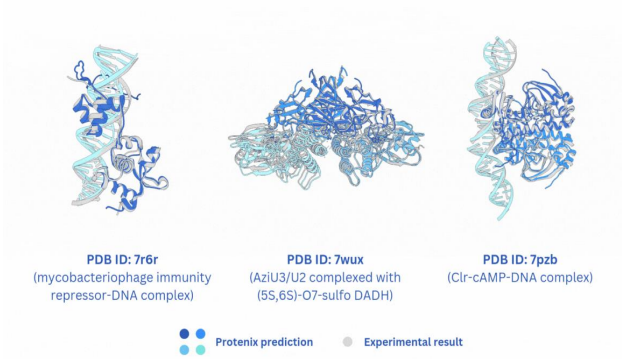
# NEWS & COMMENTARIES

## Call for Participation: Algerian Innovation Hackathon & Congress


The National Council for Scientific Research and Technologies is organizing the national conference "Innovation. Algeria-Horizon2027" in close collaboration with 18 ministerial departments with the support of the industrial partner groups of CNRST, Sonatrach, Telecom Algérie, Saidal, Cosider, Agrodiv, Sonelgaz as well as Madar and Biopharm. As a prelude to the conference on December 21, 15 hackathons on priority socio-economic themes will be held in Algiers, Oran, Constantine, Ouargla, Adrar, Boumerdés in November and December 2024.

We invite Algerian Entrepreneurs and Business leaders living Abroad to be a part of a groundbreaking program aimed at enhancing the standards of living of the Algerian population through innovation across all sectors of the national economy. In alignment with Algeria's vision for prosperity, the CNRST, in partnership with leading national public and private companies and institutions, is organizing the Algerian Innovation Congress in December 2024, preceded by an engaging Hackathon.

**Event Site https://www.ibtikar.info**
**Registration https://events.cnrst.dz**




## Protenix - Reproduction of AlphaFold3 now available

- Supports(input); DNA, RNA, Protein, ligands, ions including covalent modifications.
- Training datasets will be released soon
- Free for non-commercial applications ONLY, However the server outputs can be used for commercial use(please check the screenshot highlighted in the comment)

**Webserver: http://101.126.11.40:8000/#/submit-task**
**Code: https://lnkd.in/dmSaTDP3**

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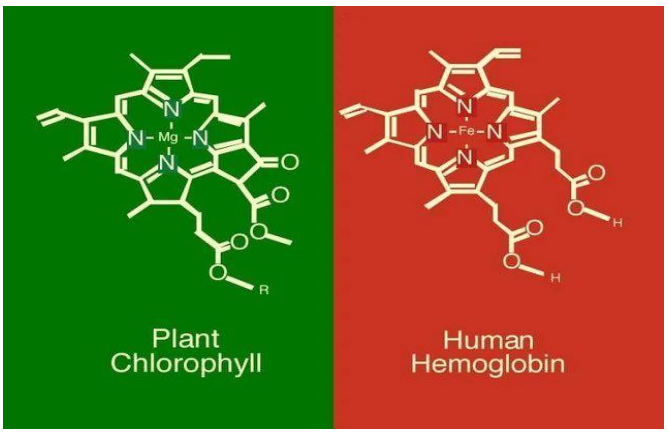


## Chlorophyll and Hemoglobin

The key difference between chlorophyll and hemoglobin lies in their metal components. Plant blood contains a magnesium (Mg) molecule, while our blood has an iron (Fe) molecule. Magnesium is what gives plant blood its green color while iron is responsible for the red hue of human blood.Oxygen proximity and orientation in the ester (in chlorophyll) and acid chains (hemoglobin), the ability to form hydrogen bonds and the way the two molecules are oriented in space, they all contribute to key differences in these two molecules in addition to the metal. Other molecules will interact with these two molecules to give us life at so many levels! I count 26 pi electrons total in both molecules. However, I think the most important feature of both molecules is their ability to maintain integrity and functionality in two different environments. One immersed in a mixture of minerals, plant essential oils, glucose, flavonoids, proteins and phenolic acids, to name a few, while the other is immersed in inorganic salts, bicarbonate, amino acids, glucose, and proteins (of course much more depending on how you look at it). Biochemistry is wonderful isn't it?

# SELECTED PUBLICATIONS


## To conquer antimicrobial resistance in Africa, build local capacity

**Nature Medicine Editorial, 2024**

**https://doi.org/10.1038/s41591-024-03325-8**

Increases in antimicrobial resistance globally are likely to hit African countries the hardest. Strengthening the local infrastructure aimed at combating infection is the only way to counter it. In 1930, the UK pathologist Cecil George Pain1 successfully treated an eye infection with penicillin. This ushered in an era of antimicrobial agents and a rapid decline in deaths caused by infectious diseases

## Cell therapy for neurological disorders

**Soshana P. Svendsen & Clive N. Svendsen, 2024**

**https://doi.org/10.1038/s41591-024-03281-3**

The review summarizes the application of cell therapies for neurological disorders and compares it to the conventional medicines. The approach is capable to replace damaged nervous tissue and integrate into the brain or spinal cord to produce functional effects for the lifetime of the patient. The article also discusses the major challenge facing this type of therapy that includes cell sourcing, which historically relied mainly on fetal brain tissue in addition to other major challenges and how to address them.

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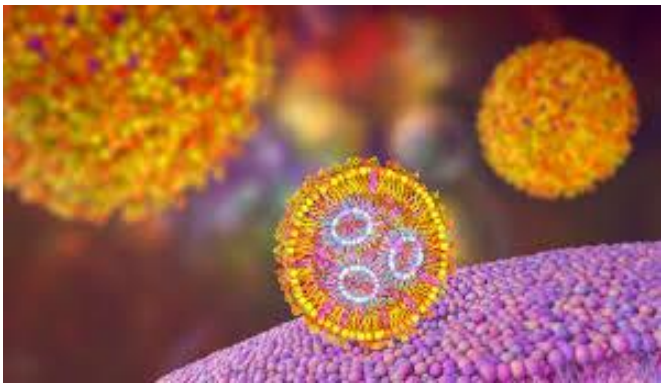
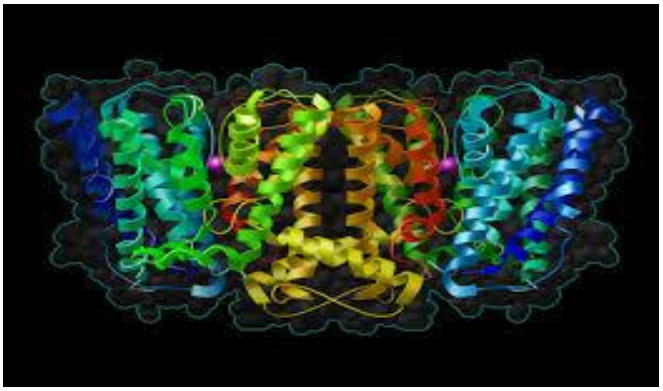


## Toward understanding lipid reorganization in RNA lipid nanoparticles in acidic environments

**Garaizar et al., 2024**

**https://doi.org/10.1073/pnas.2404555121**

The research article presents the understanding of the design of lipid nanoparticles (LNPs) to deliver different type of therapies that includes mRNA based vaccine. It shows how variations in LNP composition influence their structural dynamics and RNA release within cells. The findings help in developing effective tools for rapid screening of LNPs, by reducing the variable space for formulation optimization.



## Identification of a divalent metal transporter required for cellular iron metabolism in malaria parasites

**Kade M. Loveridge and Paul A. Sigala, 2024**

**https://doi.org/10.1073/pnas.2411631121**

The article addresses how the Plasmodium falciparum malaria parasites invade and multiply inside red blood cells (RBCs and the possible mechanism of iron acquisition and trafficking during RBC infection. The study indicates that P. falciparum DMT1 (PfDMT1) retains conserved molecular features critical for metal transport that is localized to the FV membrane and defined its orientation in an export-competent topology. The different technologies to address this matter and propose it as a new therapeutic target to fight the malaria infection.

## Metformin decelerates aging clock in male monkeys

**Yang et al.,**

**https://doi.org/10.1016/j.cell.2024.08.021**

This study summarizes the evaluation of the geroprotective effects of metformin on adult male cynomolgus monkeys, addressing a gap in primate aging research. It uses encompassed a comprehensive suite of physiological, imaging, histological, and molecular evaluations, substantiating metformin's influence on delaying age-related phenotypes at the organismal level. The study showed that there is a significant slowing of aging indicators, notably a roughly 6-year regression in brain aging. It shows that metformin exerts a substantial neuroprotective effect, preserving brain structure and enhancing cognitive ability.

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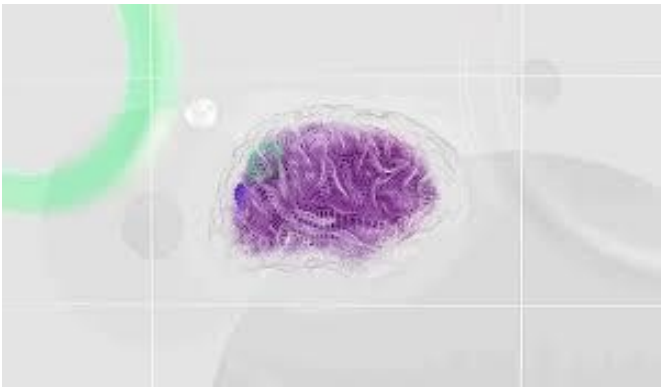
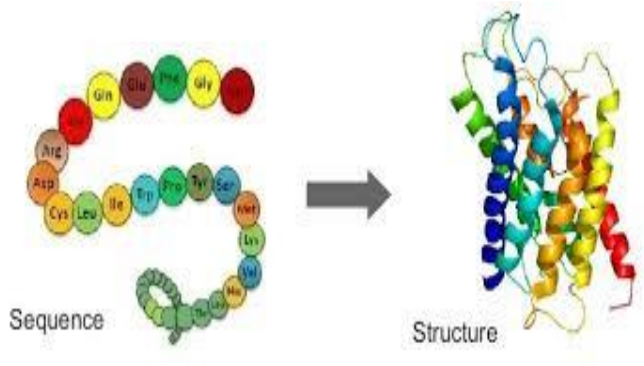


## Empowering biomedical discovery with AI agents

**Shanghua Gao et al., 2024**

**https://www.cell.com/cell/fulltext/S0092-8674(24)01070-5**

The article explains how the integration of human thinking and creativity with AI to analyze large datasets, navigate hypothesis spaces, and execute repetitive tasks. AI agents are poised to be proficient in various tasks, planning discovery workflows and performing self-assessment to identify and mitigate gaps in their knowledge. However, incorporating the human approach in the analysis with make more discoveries and realistic finding and propositions.




## Computational structure prediction protocols

**Ivanka Kamenova, Bronwen Dekker & Rosy Favicchio 2024**

**https://www.nature.com/collections/ijbhaiajfa**

The link is a compilation of the selected protocols and tutorials that show the diverse applications of computational structure prediction methods. The exercise is to celebrate the 2024 Nobel Prize in Chemistry awarded for computational protein design and protein structure prediction, we have compiled a selection of our Protocols and Tutorials showcasing the diverse applications of computational structure prediction methods.

## Neoadjuvant vidutolimod and nivolumab in high-risk resectable melanoma: A prospective phase II trial

**Diwakar Davar et al., 2024**

**https://doi.org/10.1016/j.ccell.2024.10.007**

A study combining the TLR9 agonist vidutolimod with anti-PD-1 nivolumab in high-risk melanoma showed a 55% major pathologic response (MPR) in 31 patients. MPRs featured increased CD8+ T cells and plasmacytoid dendritic cells in the tumor, along with peripheral Ki67+CD8+ T cells. Responders had specific myeloid gene signatures and gut microbiota enriched with Gram-negative bacteria. This combination therapy stimulates robust anti-tumor immunity and could represent a new approach for treating melanoma.

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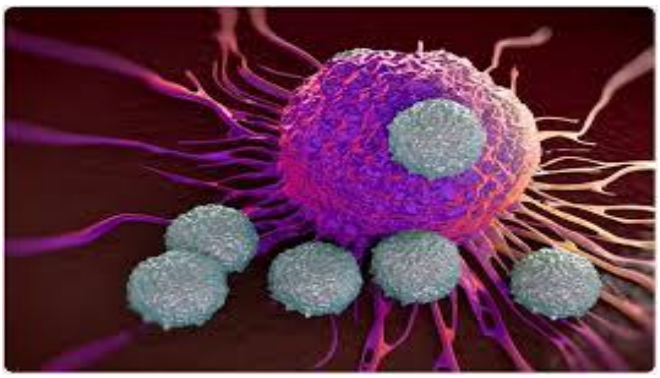
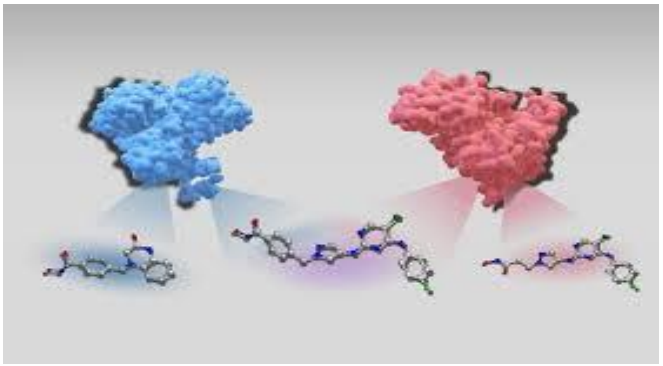


## Regulation of CD8+ T cells by lipid metabolism in cancer progression

**Yong Tang et al., 2024**

**https://doi.org/10.1038/s41423-024-01224-z**

Dysregulated lipid metabolism in tumors impairs CD8+ T-cell function, affecting their ability to combat cancer. Recent findings show that tumor-associated lipids hinder T-cell activities by impacting mitochondrial function. This review explores how lipid uptake, synthesis, and oxidation regulate CD8+ T cells and discusses systemic links between lipid metabolism and immune response. Targeting lipid pathways could enhance immunotherapy effectiveness and strengthen CD8+ T-cell-mediated antitumor activity, offering new strategies for cancer treatment.



## Generation of dual-target compounds using a transformer chemical language model

**Sanjana Srinivasan, Jürgen Bajorath 2024**

**https://doi.org/10.1016/j.xcrp.2024.102255**

Researchers have developed transformer-based chemical language models for designing compounds targeting two distinct disease factors, crucial for treating complex conditions. By pre-training models to learn single- to dual-target mappings and using a cross-fine-tuning approach, these models can generate compounds with desired dual-target activity. The final models accurately reproduced known compounds and created structural analogs, showcasing their potential for advancing multi-target drug discovery.

## An emerging multi-omic understanding of the genetics of opioid addiction

**Johnson et al., 2024**

**https://doi.org/10.1172/JCI172886.**

Opioid addiction remains a major global health crisis, but new omics-based research is uncovering biological pathways that could lead to better treatments. Genetic studies highlight key variants in OPRM1, FURIN, and other gene clusters linked to addiction. Analyses of postmortem brain tissues reveal gene dysregulation associated with overdose deaths. These findings, combined with systems biology and neurobiology, identify potential targets for developing more effective therapies.

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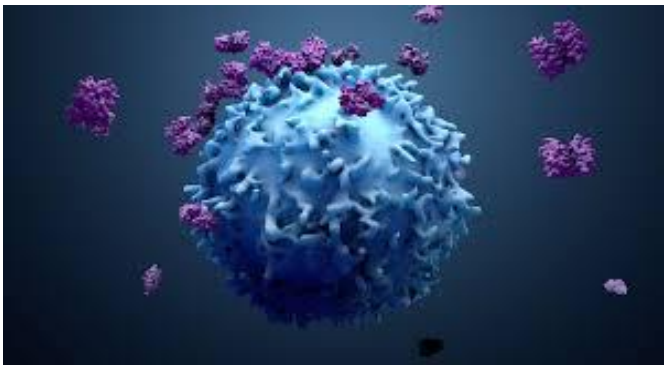
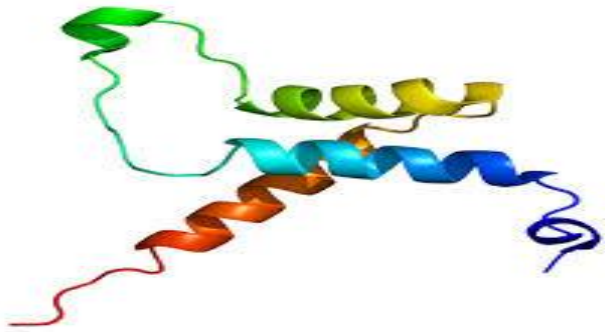


## Immune-related events in individuals with solid tumors on immunotherapy associate with Th17 and Th2 signatures

**Chester J. Kao et al., 2024**

**https://doi.org/10.1172/JCI176567.**

In a study of 111 cancer patients on immune checkpoint inhibitors (ICIs), 40.5% developed significant immune-related adverse events (irAEs). The risk was higher with combination ICIs and in those with autoimmune histories. Early changes in Th17 and Th2 cytokine levels and memory T cell populations were linked to severe irAEs but not better cancer outcomes. Elevated IL-6 correlated with poorer survival, suggesting potential biomarkers and targets for managing irAE risk.



## Discovery of reversible and covalent TEAD 1 selective inhibitors MSC-1254 and MSC-5046 based on one scaffold

**Emma Carswell et al., 2024**

**https://doi.org/10.1016/j.bmcl.2024.129981**

The TEAD family, crucial in cell growth and apoptosis, is part of the Hippo signaling pathway. A recent study optimized an initial hit from a high-throughput screening (HTS) campaign to create potent, TEAD1-selective inhibitors with reversible and covalent inhibition modes. TEAD1 selectivity was linked to unique structural features in its palmitoylation site, offering a promising path for new anticancer treatments

# RECOMMENDED EVENTS

### 2nd Healthy Longevity Symposium

Healthy Longevity Symposium

**21-22 November, 2024**

**Khalifa University**

**Main Campus Auditorium**

The Healthy Longevity Symposium unites experts to drive discussions and provide insights on longevity by addressing the common root cause of chronic diseases - aging. This event explores recent breakthroughs in aging mechanisms and rejuvenation, genomic precision medicine and precision prevention, advanced technologies, and social health policies. Aging is a multifaceted process influenced by genetics, lifestyle, environmental exposures, and psychological factors. Advances in genomics and AI enable us to predict the epigenetic and transcriptomic roles of genes, offering new strategies to slow age-related diseases, enhance well-being, and promote longevity.

**https://ku.events/healthy-longevity-symposium/**

## AACR Annual Meeting 2025: Register Today


**April 25-30, 2025 • McCormick Place Convention Center • Chicago, IL**

Register by January 3 to take advantage of the lowest rates for the AACR Annual Meeting 2025

**https://www.aacr.org/meeting/aacr-annual-meeting-2025/registration/**

sict
Swiss Institute of Cell Therapies

## CELL THERAPY IN SWITZERLAND: CLINICAL APPLICATIONS AND MANUFACTURING INSIGHTS WHERE DO WE STAND?

**21 November 2024**

**Organisé par la Fondation Institut Suisse des Thérapies Cellulaires (SICT)**

**https://agenda.unige.ch/events/view/41152**

## 36th BMCS Spring Symposium on Medicinal Chemistry!


Known colloquially as the “Hatfield MedChem” meeting, this is a highly successful, long-standing, one-day meeting that runs annually.

The scientific program will comprise presentations showcasing medicinal chemistry case studies from tools to candidates, across a range of modalities, therapeutic areas and target classes, as well as covering more general topics at the forefront of drug discovery

**Dates: Thursday, 24th April 2025: Place: Fielder Centre, Hatfield, UK**

**https://www.rscbmcs.org/events/hatfield25/**

BioSciTech research network | كيمارك KAIMRC

# AI IN DRUG DISCOVERY: THE REALITY VS THE FOU

Topic :

**Exploring the possibilities and limitations of AI in drug discovery. Is AI truly the golden solution?**

Each panelist will give 5 minutes introduction of their topic followed by panel discussion for 90 minutes

Thursday. 11th December, 2024

8:00 PM Riyadh time / 9:00 AM Pacific time

Zoom link to registered attendees

Moderated by:
1- Dr Mohamed Boudjelal - KAIMRC
2- Dr Sergio Senar - DrTarget


Registration:

https://forms.gle/QeJ9f1eUi6wq8Z8aA

Coordinators:
Dr. Faez Amokrane Nait Mohamed - HMS
Dr Mohamed Belhocine - AGU

## E-PANEL DISCUSSION

**Dr. Shameer Khader**
Executive Director at Sanofi

**Dr. Andrew Satz**
Co-Founder & CEO @ EVQLV

**Dr. Fayez Safadi**
Director @ NEOMED | Northeast Ohio Medical University (NEOMED)

**Dr. Riyaz Syed**
Founder & CEO @ Centella AI Therapeutics

**Dr. Rolando Rodriguez**
Senior Principal Scientist, Computational Protein Design, Arzeda

**Dr. Zara Ghazoui**
Director of Data Strategy, Astra Zeneca

**Dr. Sergio Senar**
Founder of DrTarget,

**Dr. Alessandro Monge**
Managing Partner, Blue Dolphin

BLUE DOLPHIN | DrTarget machine learning