

NEWS & COMMENTARIES

**New Chronic Obstructive Pulmonary Disease Approved**

European Commission has approved our medicine for adults with uncontrolled Chronic Obstructive Pulmonary Disease with raised blood eosinophils. It is the first-ever targeted therapy for COPD. COPD, a respiratory disease that causes progressive decline in lung function, is the fourth leading cause of death worldwide. This approval, based on landmark data, brings forward the first new treatment for COPD in more than a decade.

Read more here: <https://lnkd.in/edzzUGDb>

**Neuroscientists must not be afraid to study religion**

McNamara et al., 2024

<https://doi.org/10.1038/d41586-024-02153-7>

Researchers focusing on the brain have historically steered clear of exploring religion or spirituality due to concerns about their scientific credibility. This cautious approach should be reconsidered. Approximately 85% of people worldwide adhere to a religious belief system. Studies in the social sciences have revealed that engaging in religious or spiritual practices can have positive effects on individuals, such as boosting health and overall happiness, fostering empathy and altruism, and even aiding in cognitive decline prevention and substance

abuse avoidance. However, it is important to acknowledge that throughout history, religion and spirituality have also been catalysts for conflict, division, and oppression.

**How I turned seemingly ‘failed’ experiments into a successful Ph.D.**

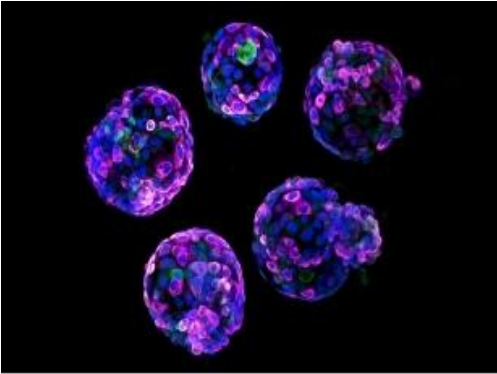
By SHREYA PRAMANIK 2024

<https://www.science.org/content/article/how-i-turned-seemingly-failed-experiments-into-a-successful-phd>

I sat alone in our microscopy room, staring at the blank wall. “It doesn’t work no matter what I do!” I thought despairingly. I had spent the past 10 months repeating an experiment with various tweaks to the protocol, and still I saw nothing—the synthetic vesicles that were supposed to divide weren’t dividing at all. A progress report about my Ph.D. project was due in a month, and I felt I had nothing to write

about. I began to question whether I belonged in academia. But I would soon discover there is always a lesson to be learned, even when experiments don’t go as planned.

SELECTED PUBLICATIONS



U.K. publishes first guidelines for human embryo models grown from stem cells

BYALEX EPSHTEIN

<https://www.science.org/content/article/uk-publishes-first-guidelines-for-embryo-models-grown-from-stem-cells>

The primary goal of the new code of practice is to bring clarity to the ethical and legal confines of a swiftly advancing research area. First-ever guidelines in the United Kingdom recommend the establishment of a dedicated committee responsible for overseeing all research involving stem cell-derived embryo models. Developed by a working group led by experts from the University of Cambridge and released

yesterday, this framework intends to address longstanding uncertainties concerning ethics and laws that have previously caused confusion among researchers.



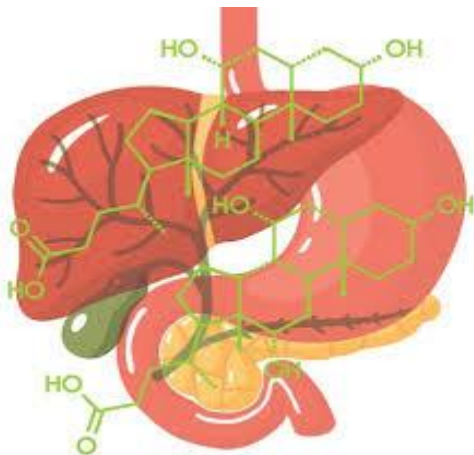
TERT activation targets DNA methylation and multiple aging hallmarks

Shim et al., 2024

<https://doi.org/10.1016/j.cell.2024.05.048>

Insufficient telomerase activity, resulting from low telomerase reverse transcriptase (TERT) gene transcription, contributes to telomere dysfunction and aging pathologies. In addition to its traditional role in telomere synthesis, TERT serves as a transcriptional co-regulator of genes crucial in aging and age-related diseases. Shim et al., 2024 study identified a TERT activator compound (TAC) that increases TERT

transcription through the MEK/ERK/AP-1 cascade. In primary human cells and naturally aged mice, the elevation of TERT levels induced by TAC promotes telomere synthesis, reduces cellular senescence and inflammatory cytokines, and suppresses p16INK4a expression by enhancing DNMT3B-mediated promoter hypermethylation.....

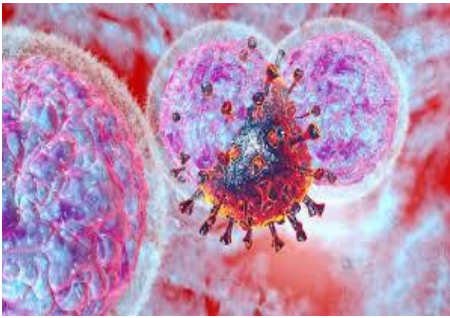


Breaking boundaries: Bacteria act as architects of host T cell modulators using bile acids

LINA YAO 2024

[https:// 10.1126/science.adq2341](https://10.1126/science.adq2341)

Bile acids, traditionally recognized for their essential function in food breakdown and absorption, are not just bystanders in the digestive process. They are produced from cholesterol in the liver and are altered chemically by countless gut bacteria to create a diverse range of secondary bile acids. New studies highlight secondary bile acids as natural messengers that directly impact the body's functions. These molecules play a role in antimicrobial activities, as well as in the development of colon and liver cancers by interacting with nuclear receptors, influencing the host's metabolism and energy usage.....

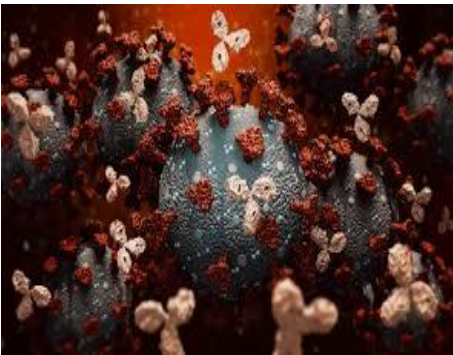


Dysfunctional natural killer cells can be reprogrammed to regain anti-tumor activity

Batel Sabag et al., 2024

<https://doi.org/10.1038/s44318-024-00094-5>

Natural killer (NK) cells play a crucial role in the innate immune system by recognizing antigens without prior sensitization, aiding in the control and elimination of viral infections and cancer. Despite this, a notable portion of NK cells in both mice and humans lack classical inhibitory receptors during their maturation, leading to a state of natural "anergy" characterized by reduced effector functions. The mechanisms behind NK cell anergy and its relationship to NK cell exhaustion resulting from chronic overstimulation are not yet fully understood. Batel Sabag et al., 2024 delves into the anergic phenotype, revealing similarities in function, gene expression, and characteristics to exhausted NK cells found in tumor environments. Additionally, Batel Sabag et al. have identified zinc finger transcription factor Egr2 and diacylglycerol kinase DGK α as key negative regulators that contribute to NK cell dysfunction.



A metabolic inhibitor blocks cellular fucosylation and enables production of afucosylated antibodies

Pierre-André Gilormini et al., 2024

<https://doi.org/10.1073/pnas.2314026121>

Fucose, a monosaccharide, is commonly found in glycoproteins of multicellular organisms. Its presence modulates the functions of various proteins, influencing a wide range of physiological processes. For instance, fucose on N-glycans of antibodies reduces their affinity for a receptor on white blood cells, thereby decreasing their ability to kill cancer cells. Through a mechanism-inspired approach, Pierre-André Gilormini et al. have developed a fucose mimetic that effectively inhibits cellular fucosylation. This mimetic can be used as an additive to produce potent afucosylated anticancer antibodies.....



A molecular glue degrader of the WIZ transcription factor for fetal hemoglobin induction

PAMELA Y. TING et al., 2024

<https://www.science.org/doi/10.1126/science.adk6129>

Sickle cell disease (SCD) is a common and life-threatening disease caused by an inherited mutation in β -hemoglobin. The induction of HbF has been a focus for improving disease complications, but safe and effective small-molecule inducers of HbF have been difficult to find. PAMELA Y. TING et al. discovery of dWIZ-1 and dWIZ-2, molecular glue degraders of the WIZ transcription factor, has shown promising results in inducing HbF in erythroblasts. Through phenotypic screening of a CRBN-biased chemical library, we identified WIZ as a previously unknown repressor of HbF. The degradation of WIZ is achieved by recruiting WIZ(ZF7) to CRBN by dWIZ-1, as confirmed by crystallography of the ternary complex.....



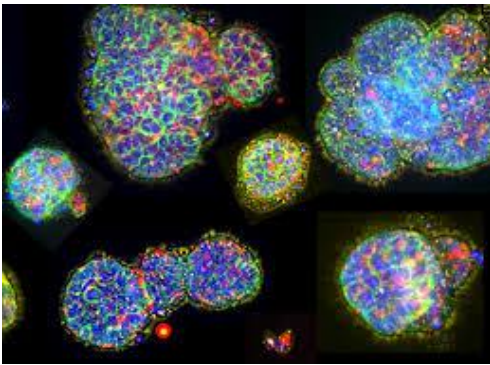
tracerDB: a crowdsourced fluorescent tracer database for target engagement analysis

Johannes Dopfer et al., 2024

<https://doi.org/10.1038/s41467-024-49896-5>

Investigating ligand-protein complexes is crucial in the fields of chemical biology and drug discovery. However, obtaining detailed information on important reagents like fluorescent tracers and associated data for the advancement of commonly used bioluminescence resonance energy transfer (BRET) assays, including

NanoBRET, time-resolved Förster resonance energy transfer (TR-FRET), and fluorescence polarization (FP) assays, can be challenging for the research community. To address this issue, Johannes Dopfer et al. have developed tracerDB, a meticulously curated database of validated tracers. This valuable resource offers an accessible knowledge base and a standardized platform for tracer and assay validation. Researchers can freely access the database at <https://www.tracerdb.org/>.



Protocol for generation of and high-throughput drug testing with patient-derived colorectal cancer organoids

Tao Tan et al., 2024

<https://doi.org/10.1016/j.xpro.2024.103090>

Drug sensitivity testing using patient-derived tumor organoids (PDTOs) shows great potential in customizing cancer treatment. In this study, Tao Tan et al. outline a procedure for creating and conducting high-throughput drug testing with PDTOs. We explain the specific steps involved in establishing PDTOs from colorectal cancer tissues, preparing them for drug testing, and analyzing the results through image

analysis. This protocol offers a standardized approach for testing PDTOs with conventional cancer therapies, as well as investigating the effectiveness of new treatment options in translational research.....

RECOMMENDED EVENTS



BioInnovation Institute (BII) and Science award the BII & Science Prize for Innovation. Behind every life-changing solution is an entrepreneurial scientist – a creative mind who proved an idea in the lab and dared to carry it out in the world.

To encourage more scientists to translate their research, BioInnovation Institute (BII) and Science collaborate to host an annual award. Through the BioInnovation Institute & Science Prize for Innovation, the editors of Science seek to recognize bold researchers who are asking fundamental questions at the intersection of the life sciences and entrepreneurship. **TO APPLY**

<https://www.science.org/content/page/bioinnovation-institute-science-prize-innovation>

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Hong Kong International Biotechnology Convention

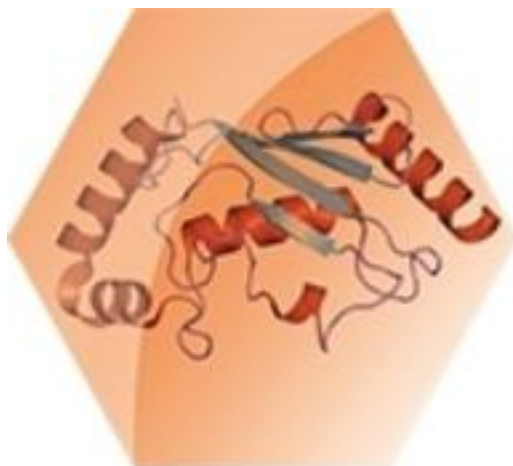
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<https://www.drugdiscoverychemistry.com/europe/degraders-molecular-glues#1>