

AI News Digest

03/09/2026 - 03/15/2026

WEEKLY DIGEST: BIOLOGICAL & BIOMEDICAL SCIENCES

Innovative Approaches Transform Drug Development and Protein Design

Recent advancements in biological and biomedical sciences highlight innovative methodologies that are reshaping drug development and protein engineering. Notably, the introduction of an 'anti-Friedel-Crafts' reaction at the University of Cambridge promises to enhance drug modification efficiency. Meanwhile, researchers at TACC are designing proteins that can self-assemble under extreme conditions, pushing the boundaries of material science. These breakthroughs, alongside explorations into tumor evolution and energy generation, underscore the interdisciplinary nature of modern scientific research.

KEY FINDINGS

- ✓ AlphaFold 2 has created a comprehensive database of protein structures.
- ✓ Cambridge researchers developed a light-activated method for drug modification.
- ✓ TACC's proteins can self-assemble under extreme pH and temperature conditions.

IMPLICATIONS

- Enhanced drug development processes could lead to faster therapeutic solutions.
- Self-assembling proteins may revolutionize material science applications.
- Understanding tumor evolution could improve cancer treatment strategies.

Key Metrics: 10 years of AlphaGo's impact on AI advancements.; Efficiency of drug modification significantly improved with new methods.; Protein design achieved under extreme conditions using Stampede3 supercomputer.

1. From games to biology and beyond: 10 years of AlphaGo's impact

Category: Research
Departments: Biological Sciences, Computer Science, Mathematical Sciences, Engineering Education & Leadership
Topics: Healthcare AI, Protein Structure Prediction, Mathematical Reasoning, Algorithm Discovery, Multimodal AI

Impact Score: 27.0

Rubric Scores

Research Relevance: 5	Educational Value: 4	Innovation / Novelty: 5
Practical Impact: 5	Interdisciplinary Potential: 5	Ethical / Policy Implications: 3

The article discusses the advancements in AI, particularly through the development of AlphaFold 2, which successfully solved the protein folding problem and provided a comprehensive database of protein structures for global scientific use. This achievement has facilitated research in various fields, including vaccine development and enzyme engineering, and contributed to the Nobel Prize awarded to the AlphaFold team in 2024. Additionally, the article highlights the evolution of AI applications inspired by AlphaGo, such as AlphaProof for mathematical reasoning and AlphaEvolve for algorithm discovery, showcasing their capabilities in complex problem-solving and scientific collaboration. The authors emphasize the need for general AI systems, like Gemini, that can integrate knowledge across multiple modalities to drive future scientific breakthroughs.

<https://deepmind.google/blog/10-years-of-alphago/>

2. 3 Questions: Building predictive models to characterize tumor progression

Category: Research
Departments: Biological Sciences, Computer Science, Nursing, Public Health Sciences
Topics: Healthcare AI, Tumor Evolution Modeling, Extrachromosomal DNA Amplifications, Single-Cell Lineage Tracing

Impact Score: 26.0

Rubric Scores

Research Relevance: 5	Educational Value: 4	Innovation / Novelty: 5
Practical Impact: 4	Interdisciplinary Potential: 5	Ethical / Policy Implications: 3

Matthew G. Jones, an assistant professor at MIT, is investigating the evolutionary dynamics of cancer tumors, particularly focusing on extrachromosomal DNA (ecDNA) amplifications. His research aims to understand how these amplifications, which are present in approximately 25% of aggressive cancers, enable tumors to adapt and evolve in response to therapies. By employing machine learning and single-cell lineage tracing technologies, Jones seeks to decode the molecular processes underlying tumor evolution and improve patient outcomes by identifying the evolutionary pressures driving disease progression. This work emphasizes the potential of computational approaches to reveal predictable patterns in tumor behavior.

<https://news.mit.edu/2026/3-questions-building-predictive-models-characterize-tumor-progression-0310>

3. How Joseph Paradiso's sensing innovations bridge the arts, medicine, and ecology

Category: Research
Departments: Electrical & Computer Engineering, Kinesiology, Biological Sciences, Art, Public Health Sciences
Topics: Robotics, Wireless Wearable Sensing, Ecological Sensing, Sports Medicine Monitoring, Augmented Performance Technology

Impact Score: 23.0

Rubric Scores

Research Relevance: 4	Educational Value: 3	Innovation / Novelty: 4
Practical Impact: 5	Interdisciplinary Potential: 5	Ethical / Policy Implications: 2

At the MIT Media Lab, Paradiso's research focuses on the development of technologies that capture and process multiple sensing modalities for diverse applications, including the internet of things, medicine, and environmental sensing. He pioneered wireless wearable sensing, exemplified by a 1997 project involving shoes embedded with sensors for real-time augmented dance performance. His work has evolved to include group applications and sports medicine, utilizing compact wearable sensors to monitor athletes' performance and injury risk. Recently, Paradiso's team has deployed sensors in remote environments to study animal behavior, contributing to ecological understanding and conservation efforts. He was recognized as an IEEE Fellow for his contributions to wireless sensing and mobile energy harvesting.

<https://news.mit.edu/2026/mit-professor-joseph-paradiso-sensing-innovations-0310>

4. TACC: Designing Protein Building Blocks for Advanced Materials

Category: Research
Departments: Metallurgical, Materials & Biomedical Engineering, Biological Sciences, Computer Science, Electrical & Computer Engineering
Topics: Science & Research, Protein Engineering, Self-Assembly Mechanisms, Advanced Materials Applications

Impact Score: 23.0

Rubric Scores

Research Relevance: 4	Educational Value: 3	Innovation / Novelty: 4
Practical Impact: 5	Interdisciplinary Potential: 5	Ethical / Policy Implications: 2

Researchers utilized the Stampede3 supercomputer at TACC to design proteins capable of self-assembling under extreme conditions. The study addresses the limitations of natural protein folding, which typically occurs within narrow pH and temperature ranges. By engineering these proteins, the researchers aim to expand their applicability in advanced materials. The findings could have significant implications for various fields, including biotechnology and materials science.

<https://www.hpcwire.com/off-the-wire/tacc-designing-protein-building-blocks-for-advanced-materials/>

5. A lab mistake at Cambridge reveals a powerful new way to modify drug molecules

Category: Research

Departments: Pharmaceutical Sciences, Biological Sciences, Chemistry & Biochemistry

Topics: Healthcare AI, Anti-Friedel-Crafts Reaction, Light-Activated Synthesis, Late-Stage Optimization, Medicinal Chemistry

Impact Score: 22.0

Rubric Scores

Research Relevance: 4

Educational Value: 3

Innovation / Novelty: 5

Practical Impact: 4

Interdisciplinary Potential: 4

Ethical / Policy Implications: 2

Researchers at the University of Cambridge have developed a novel "anti-Friedel-Crafts" reaction that utilizes light to modify complex drug molecules, significantly enhancing the efficiency of drug development. This method, activated by an LED lamp at ambient temperature, allows for the formation of carbon-carbon bonds without the need for toxic reagents or harsh conditions, enabling precise adjustments to drug molecules later in the development process. The technique reduces the number of synthesis steps, thereby minimizing chemical use, energy consumption, and environmental impact, while maintaining high selectivity for specific molecular modifications. The findings, published in **Nature Synthesis**, represent a significant advancement in late-stage optimization for medicinal chemistry.

<https://www.sciencedaily.com/releases/2026/03/260313062539.htm>

6. Scientists create slippery nanopores that supercharge blue energy

Category: Research

Departments: Electrical & Computer Engineering, Civil, Environmental & Construction Engineering, Biological Sciences

Topics: Energy Harvesting, Nanopore Optimization, Ion Transport Enhancement, Hydration Lubrication Strategy, Osmotic Energy Generation

Impact Score: 22.0

Rubric Scores

Research Relevance: 4

Educational Value: 3

Innovation / Novelty: 5

Practical Impact: 4

Interdisciplinary Potential: 4

Ethical / Policy Implications: 2

Researchers from the Laboratory for Nanoscale Biology (LBEN) and the Interdisciplinary Centre for Electron Microscopy (CIME) have developed a novel approach to enhance osmotic energy generation by coating nanopores with lipid bilayers. This method significantly improves ion transport through the nanopores by reducing friction, resulting in a power density of approximately 15 watts per square meter-2-3 times higher than existing polymer membrane technologies. The study demonstrates the potential for precise control over nanopore geometry and surface properties to optimize ion flow and selectivity, marking a significant advancement in the design of blue energy systems. The findings, published in *Nature Energy*, suggest broader applications for the hydration lubrication strategy beyond osmotic energy harvesting.

<https://www.sciencedaily.com/releases/2026/03/260308201623.htm>

7. Why Are Viral Capsids Icosahedral?

Category: Research

Departments: Biological Sciences, Pharmaceutical Sciences, Computer Science

Topics: Science & Research, Convergent Evolution, Viral Capsid Structures, Drug Delivery Systems, Vaccine Design Innovations

Impact Score: 15.0

Rubric Scores

Research Relevance: 2

Educational Value: 3

Innovation / Novelty: 2

Practical Impact: 3

Interdisciplinary Potential: 4

Ethical / Policy Implications: 1

The article discusses the historical debate between evolutionary biologists Stephen Jay Gould and Simon Conway Morris regarding the nature of evolution, particularly the roles of contingency and predictability. Gould argued that evolutionary outcomes are highly contingent and unlikely to repeat, while Conway Morris posited that despite historical contingencies, evolution is constrained by physical and chemical laws, leading to predictable outcomes, such as convergent evolution. The article highlights examples of convergent evolution, including antifreeze proteins in fish and C4 photosynthesis in plants, and emphasizes the predictability of viral capsid structures, which have inspired advancements in drug delivery and vaccine design. Understanding the genetic and structural constraints that lead to these convergences provides insight into the evolutionary process and its implications for biological innovation.

<https://www.asimov.press/p/viral-capsids>