



美东华美化学与化工学会

Chinese American Chemical Society – East Chapter

E-CACS Newsletter

July 2026

July Issue Editors:

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Editor's Note

Welcome to the July 2026 issue of the E-CACS Newsletter. This issue continues our tradition of highlighting advances in scientific innovation, emerging industry trends, and active community engagement across the E-CACS network.

In **Academic News**, we feature groundbreaking research demonstrating that dual TGF β R inhibition and LTBR activation can enhance anti-tumor immunity in pancreatic cancer, as well as a comprehensive whole-brain cellular atlas that reveals how circadian rhythms regulate neural activity.

Our **Cosmetics & Personal Care** section explores the growing scientific scrutiny of longevity-focused beauty claims, reviews HAPPI's Top 50 U.S. beauty companies, and examines new research showing that hair shine is fundamentally a structural and optical property rather than simply a result of surface coatings.

In **Process & R&D Innovation**, we look back on the ACS's 150-year legacy in analytical chemistry, discuss the evolving regulatory landscape for ultra-processed foods, highlight advances in fragrance-delivery technologies, and celebrate the winners of the 2026 Green Chemistry Challenge Awards.

The **Pharma & Biotech** section covers major developments in mRNA patent litigation, the expanded FDA approval of Vertex's gene-editing therapy CASGEVY, proposed U.S. tariffs on imported generic drugs, and a wave of biotech acquisitions driven by the looming patent cliff.

Finally, our **Innovation News Highlights** showcase notable advances in gene therapy, AI-driven drug discovery, catalysis, sustainable materials, battery technology, cosmetic science, and AI-powered chemical engineering.

In this issue's **Member Highlight**, we are pleased to introduce **Yanpeng Hou, Ph.D., Lead Scientist at IFF**, whose expertise and leadership continue to advance analytical science and innovation. In our **Sponsor Highlight**, we recognize **Johnson & Johnson MedTech**, a leader in the global medical technology industry, delivering innovative solutions across surgery, orthopaedics, vision, and cardiovascular care.

Member Highlight

Yanpeng Hou, Lead Scientist, IFF



Yanpeng Hou, Ph.D., is a Lead Scientist at International Flavors & Fragrances (IFF), where he leads LCMS analytical operations and global innovation initiatives in non-volatile analysis to support flavor and fragrance ingredient discovery and development. He brings extensive expertise in liquid chromatography–mass spectrometry, metabolomics, chemical profiling, structure elucidation, and natural products chemistry, with a career spanning industrial R&D and academic research. Prior to joining IFF, Dr. Hou held scientific leadership roles at PepsiCo, where he established chemical profiling platforms and led multidisciplinary discovery chemistry projects that delivered actionable insights for ingredient innovation, product quality, and raw material advancement. His academic research experience includes postdoctoral work at the University of Wisconsin–Madison and doctoral research at Virginia Tech, with a focus on microbial and plant natural products. Dr. Hou earned his Ph.D. in Chemistry from Virginia Tech and is an active member of the American Chemical Society and the American Society for Mass Spectrometry. He has authored numerous peer-reviewed publications and continues to contribute to the advancement of analytical chemistry and applied scientific innovation.

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What's New in Chemistry

Academic News

Contributor: Xiaozhou Feng

Dual TGF β R Inhibition and LTBR Activation Enhance T Cell Immunity in Pancreatic Cancer

Pancreatic ductal adenocarcinoma (PDAC) remains one of the most immunotherapy-resistant cancers, largely because its dense stromal environment limits effective immune cell infiltration. Dr. Andrew J. Gunderson's lab identified a critical stromal mechanism that determines whether tumors can develop tertiary lymphoid structures (TLS), specialized immune niches associated with improved patient survival.

The authors demonstrate that TGF β signaling drives fibroblasts toward a myofibroblast (myCAF) phenotype, which suppresses the differentiation of reticular cancer-associated fibroblasts (rCAFs) responsible for producing lymphocyte-recruiting chemokines such as CXCL13 and CCL19. As a result, T- and B-cell recruitment and TLS formation are impaired. Conversely, combining TGF β receptor inhibition with lymphotoxin β receptor (LTBR) agonism reprograms myCAFs into rCAFs, restores chemokine production, promotes TLS development, enhances T-cell infiltration, and significantly improves tumor control in mouse PDAC models. Importantly, therapeutic efficacy depends on functional T cells rather than B cells alone.

Spatial transcriptomic analysis of human PDAC further revealed that rCAFs are enriched adjacent to TLS, whereas myCAFs are located farther away, highlighting the clinical relevance of fibroblast spatial organization. Together, these findings establish CAF plasticity as a key regulator of anti-tumor immunity and suggest that simultaneous TGF β R blockade and LTBR activation represents a promising strategy to convert immunologically “cold” pancreatic tumors into immune-responsive tumors.

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A Whole-Brain Cellular Map Reveals Circadian Control of Neural Activity

The mammalian brain contains complex neural circuits that coordinate daily rhythms in behavior, physiology, and cognition. A new whole-brain single-cell atlas of circadian neural activity in mice provides an unprecedented view of how diverse neuronal populations synchronize with the day–night cycle. Using large-scale single-cell transcriptomics and activity mapping, researchers identified widespread circadian patterns across thousands of brain regions and cell types. The atlas reveals distinct temporal signatures in neuronal populations involved in sleep, metabolism, sensory processing, and emotional regulation. This comprehensive resource uncovers previously unrecognized cellular networks underlying biological timing and offers new insights into how circadian disruption may contribute to neurological and psychiatric disorders. The study establishes a powerful framework for understanding brain-wide rhythmic organization at single-cell resolution.

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Cosmetics & Personal Care

Contributor: Guangru Mao

FIT Think Tank Questions Longevity Beauty Claims

Longevity has become one of the beauty industry's fastest-growing trends, yet experts at the 2026 Future of Innovation & Technology (FIT) Think Tank caution that the science behind many "longevity" claims has not kept pace with marketing. The panel emphasized that while advances in cellular senescence, epigenetics, and systems biology are generating promising research, many cosmetic products rely on preliminary mechanistic data rather than evidence demonstrating meaningful consumer benefits. Participants also highlighted the need for greater transparency, standardized terminology, and stronger claim substantiation to maintain scientific credibility. The discussion reflects a broader industry shift toward evidence-based innovation, reminding researchers and marketers that emerging biological insights must ultimately translate into measurable consumer outcomes before supporting compelling product claims.

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HAPPI Releases 2025 Top 50 U.S. Beauty Companies Ranking

HAPPI has released its annual ranking of the Top 50 U.S. beauty and personal care companies, offering a snapshot of the industry's competitive landscape. While the ranking highlights continued leadership by multinational manufacturers, it also reflects shifting market dynamics driven by premiumization, dermatology-inspired skincare, wellness positioning, and strategic acquisitions.

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Rethinking Hair Shine: Beyond Surface Coatings

Hair gloss has traditionally been associated with smooth surface coatings such as silicones and conditioning agents. However, recent research highlights that shine is fundamentally an optical phenomenon governed by hair fiber structure and light reflection. Surface smoothness, cuticle alignment, and internal fiber morphology collectively determine how light is reflected, influencing gloss perception. The article argues that improving shine requires more than depositing a coating—it calls for preserving or restoring the hair's structural integrity to optimize optical performance. This perspective encourages formulators to rethink traditional shine strategies and consider technologies that modify fiber architecture in addition to surface conditioning. As consumers increasingly associate healthy-looking hair with shine, understanding its underlying optical mechanisms may inspire more effective and scientifically grounded product innovations.

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Process & R&D Innovation

Contributor: Yanpeng Hou

The ACS at 150: A Century of Progress in Analytical Chemistry

As the American Chemical Society (ACS) celebrates its 150th anniversary in 2026, a retrospective article by Jonathan V. Sweedler traces the remarkable evolution of analytical chemistry and the journal *Analytical Chemistry* from its roots in the late 19th century to its current global influence. The article highlights how analytical chemists played a foundational role in the early ACS, the launch of *Industrial and Engineering Chemistry Analytical Edition* in 1929, and the journal's transformation into a leading platform for advances in measurement science. Through the leadership of seven editors and publication of landmark papers ranging from colorimetric assays and cyclic voltammetry to MALDI mass spectrometry, microfluidics, and cheminformatics, the journal has chronicled and often driven major scientific breakthroughs. Today, with rapidly growing international participation, expanding measurement science portfolios, and the emergence of AI-enabled research and publishing, *Analytical Chemistry* continues to shape the future of chemical measurement as it approaches its own centennial in 2028.

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The Coming UPF Regulation Revolution

Governments worldwide are accelerating efforts to define and regulate ultra-processed foods (UPFs), signaling a major shift in food policy. While food regulations have traditionally focused on nutrients such as sugar, salt, and fat, policymakers are increasingly examining how foods are processed. The U.S. FDA is developing the first federal UPF definition, which could influence

future rules on labeling, school meals, procurement, advertising, and litigation. California has already enacted legislation targeting UPFs in school food, while WHO, Brazil, and the European Commission are considering stronger measures. For manufacturers, this represents a new challenge: products that have been successfully reformulated for nutrition may still be classified as UPFs. With regulatory definitions, litigation, and consumer scrutiny all gaining momentum, food companies should closely monitor developments and prepare for a potentially transformative regulatory landscape.

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Fragrance Innovation Moves Beyond the Formula

Leading fragrance companies are increasingly focusing on *how* fragrance is delivered, not just the scent itself. A recent article highlights strategic investments by **Givaudan** and **IFF** in next-generation fragrance delivery technologies that offer longer-lasting performance, enhanced consumer experiences, and greater formulation flexibility. Givaudan has partnered with Swiss startup Microcaps AG to advance biodegradable microencapsulation technology, enabling alcohol-free, water-based fragrance systems with improved sustainability and skin compatibility. Meanwhile, IFF's new **Sensora** platform uses light-activated pro-fragrance chemistry to release scent gradually over time, potentially bringing self-refreshing fragrance experiences to products such as deodorants, shampoos, and body washes. Together, these developments reflect a broader industry shift toward advanced delivery systems that can improve stability, reduce fragrance load, support sustainability goals, and create entirely new sensory experiences in personal care products.

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ACS 2026 Green Chemistry Challenge Awards Highlight Sustainable Innovation

The American Chemical Society (ACS) has announced the winners of the 2026 Green Chemistry Challenge Awards, recognizing scientific advances that make chemistry safer, more sustainable, and environmentally responsible. This year's honorees developed innovations spanning recyclable polyurethanes, greener pharmaceutical and agrochemical manufacturing, biodegradable polymers, PFAS-free semiconductor cooling fluids, and biocide-free marine coatings.

Notably, IFF received recognition for its Designed Enzymatic Biomaterials™ (DEB) platform, which uses enzyme-catalyzed polymerization to create high-performance, renewable, and biodegradable polymers with reduced climate impact and improved end-of-life circularity. Other awardees included Corteva Agriscience, Micron, PPG, BASF, Northwestern University, and Algenesis Labs. ACS emphasized that these breakthroughs demonstrate how chemistry is addressing critical environmental challenges while delivering practical benefits across industries. The award ceremony will take place at the ACS Fall Meeting in Chicago on August 26, 2026.

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Pharma & Biotech

Contributor: Scarlett Liu & Chongsong Xu

The next chapter of the mRNA industry will be driven not only by who develops the best therapies, but by who owns the foundational technologies that every therapy depends on.

Sanofi has sued Pfizer/BioNTech and Moderna, alleging that their COVID-19 vaccines—and, for Moderna, its RSV vaccine and next-generation COVID vaccine—use patented lipid nanoparticle (LNP) delivery and mRNA purification technologies acquired through Sanofi's purchase of Translate Bio. Rather than seeking to halt product sales, Sanofi is pursuing royalties and financial damages, intensifying the growing wave of mRNA patent disputes.

Insight:

The case highlights a shift in the mRNA industry from product development to ownership of the technologies that enable those products. As mRNA applications expand beyond COVID-19 into cancer, infectious diseases, and rare disorders, foundational technologies such as LNP delivery systems, manufacturing processes, and formulation platforms are becoming increasingly valuable. Recent high-profile licensing and settlement agreements have shown that these platform technologies can generate significant revenue independent of commercial product ownership. For investors, strong intellectual property portfolios are emerging as strategic assets, allowing companies to capture value across multiple therapies and markets. The industry's competitive focus is therefore evolving from who launches the best products to who controls the core infrastructure powering the broader mRNA ecosystem.

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FDA Approval on New Treatment for Sickle Cell Disease

Vertex's CASGEVY has become the first gene-editing therapy approved for children as young as two years old with sickle cell disease (SCD) and transfusion-dependent beta thalassemia (TDT). Previously limited to patients aged 12 and older, the expanded FDA approval adds roughly 5,500 eligible pediatric patients in the U.S. The review was completed in just 53 days through the FDA's Commissioner's National Priority Voucher program. Clinical studies showed sustained benefits, with treated children remaining free of severe disease events or achieving transfusion independence for at least one year.

Insight:

The approval further validates CRISPR gene editing as a clinically viable treatment platform and supports earlier intervention to prevent long-term disease complications. However, CASGEVY's slower-than-expected commercial rollout demonstrates that scientific success does not guarantee market success. Manufacturing complexity, treatment logistics, and reimbursement hurdles remain key challenges. Future growth in the gene-editing sector will depend less on

innovation alone and more on scaling operations, improving patient access, and achieving sustainable adoption.

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Trump Unveils Phased Tariff Plan to Reshore Generic Drug Manufacturing

President Trump announced a phased tariff policy aimed at bringing generic-drug manufacturing back to the United States. Beginning August 1, 2026, imported generic medicines will remain tariff-free for a two-year transition period. Tariffs will then increase to 100% for one year before rising to 200% thereafter. The administration says the phased approach gives manufacturers time to build domestic production capacity, while tariff policies for branded and patented drugs remain unchanged.

Insight:

The policy reflects growing concerns about the U.S. dependence on overseas suppliers for generic medicines and active pharmaceutical ingredients. Because generics account for more than 90% of U.S. prescriptions, strengthening domestic manufacturing has become a strategic priority. The two-year transition period provides drugmakers with an opportunity to expand U.S. production, but significant challenges remain, including manufacturing costs, reimbursement pressures, and existing purchasing models. The initiative could accelerate reshoring investments, though the industry's long-term response will depend on whether domestic production can become economically competitive before the higher tariffs take effect.

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Big Pharma Drives \$216 Billion Biotech M&A Surge Ahead of Patent Cliff

Major pharmaceutical companies are accelerating acquisitions of biotechnology firms to replenish future product pipelines, with industry deal values reaching **\$216 billion in the first half of the year**, nearing record levels. The surge is largely driven by the approaching **patent cliff**, as several blockbuster medicines face loss of exclusivity over the next few years. A key example is Merck's cancer drug **Keytruda**, which is expected to lose patent protection in 2028, creating significant revenue pressure for the company and its peers.

To offset anticipated revenue declines, pharmaceutical giants are deploying substantial cash reserves to acquire innovative biotech companies and promising late-stage drug candidates. Recent transactions have targeted high-growth areas such as oncology, rare diseases, immunology, and emerging fields including psychedelic therapies. As competition for attractive assets intensifies, valuations of high-quality biotech companies have risen sharply. While the acquisition wave provides lucrative exit opportunities for biotech investors, it may also concentrate future drug development within a smaller

number of large pharmaceutical companies, potentially reshaping the industry's innovation landscape.

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10 Innovation News Highlights

Pharmaceutical Innovations

1. Gene Therapy Offers a One-Time Treatment Option for Hunter Syndrome

RGX-121 is emerging as a promising gene therapy for Hunter syndrome, a rare genetic disorder. Unlike conventional treatments that require ongoing administration, this therapy is designed as a one-time intervention by delivering a functional gene to patients. The technology could establish a framework for similar treatments targeting other rare neurological diseases.

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2. AI-Designed Drug Shows Promise Against Lung Fibrosis

Insilico Medicine's rentosertib was developed using artificial intelligence to identify a novel drug target and design the therapeutic molecule. Early clinical results suggest potential benefits for patients suffering from idiopathic pulmonary fibrosis, a severe lung-scarring disease with limited treatment options. The achievement demonstrates how AI can accelerate pharmaceutical innovation.

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Chemical Engineering & Chemistry Innovations

3. Scientists Discover Hidden Oxygen Movement Inside Catalysts

Researchers directly observed oxygen atoms moving through the interior of catalyst materials rather than only across their surfaces. This discovery challenges the traditional understanding of catalytic reactions and may enable the design of more efficient catalysts for industrial chemical production.

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4. High-Throughput Screening Reveals New Routes for Methane Conversion

A research team evaluated 200 catalysts under numerous operating conditions and uncovered previously unidentified pathways for converting methane into valuable chemicals. The method could support more sustainable production of fuels, polymers, and industrial feedstocks.

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Materials Science Innovations

5. Regenerable Engineering Plastics Could Advance Circular Manufacturing

Scientists developed a new class of engineering plastics that can be regenerated repeatedly while maintaining high performance. The materials combine physical chain entanglements with selectively breakable chemical links, potentially reducing plastic waste and supporting circular-economy objectives.

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6. Researchers Solve a Critical Solid-State Battery Failure Mechanism

A major breakthrough in battery research has clarified how lithium dendrites crack ceramic electrolytes inside solid-state batteries, causing short circuits. Understanding this mechanism may lead to safer and longer-lasting batteries for electric vehicles and consumer electronics.

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Cosmetics Innovations

7. Plant-Derived Exosomes Enable Advanced Delivery of Skincare Ingredients

Biotechnology is transforming cosmetics through the use of plant-derived exosomes, tiny biological carriers that can improve the delivery of active ingredients to the skin. These delivery systems could enhance product efficacy while supporting more targeted skincare formulations.

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8. More Than 230 New Cosmetic Ingredients Unveiled at Industry Exhibition

The 2026 in-cosmetics Global Innovation Zone showcased a record number of new ingredients. Innovations included longevity-focused skincare actives, neurocosmetic technologies, sustainable upcycled materials, and next-generation sun-protection solutions, reflecting rapid advancement in beauty science.

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AI in Chemical Engineering

9. AI Platform Accelerates Catalyst Discovery

Tohoku University introduced DigCat 4.0, a digital catalysis platform that integrates laboratory data, computational models, scientific literature, and machine-learning capabilities. The platform helps researchers identify promising catalyst candidates more efficiently and supports innovation in clean-energy and industrial chemical applications.

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10. AI Agent Develops New Design Principles for CO₂-to-Fuel Catalysts

Researchers created a large-language-model-based Catalysis AI Agent that analyzed extensive catalyst datasets and identified design rules for copper-based catalysts that convert carbon dioxide into valuable fuel molecules. The work illustrates how AI can accelerate sustainable chemical process development and carbon-utilization technologies.

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E-CACS Member Highlight: Yanpeng Hou, Lead Scientist, IFF

1) How long have you been an ECACS member?

I have been actively volunteering at East CACS events since 2023. I have been serving as the executive board member for E-CACS since 2025.

2) What role (s) are you currently active in?

I serve as a member of the Department of Resource Development.

3) How has being part of ECACS impacted your professional or community work?

Being part of ECACS has expanded my professional network by connecting me with experts from both academia and industry. It also gives me a platform to represent IFF in the broader chemistry community, increasing visibility for both the company and myself. Most importantly, ECACS allows me to support younger chemists by sharing career advice and helping them connect with mentors, resources, and job opportunities.

4) Favorite ECACS memory or event (brief story or highlight)?

My favorite ECACS memory so far is the 2026 ECACS Annual Conference. I was proud to help secure sponsorship from IFF and invite IFF Senior Vice President Adam Janczuk to deliver the keynote speech. Adam was extremely supportive and gave an inspiring talk that strongly resonated with the audience. I was very happy to help make that meaningful moment happen.

5) What advice would you give to new ECACS members?

My advice to new ECACS members is to actively participate in society events and take full advantage of the opportunities to learn from experts across different areas of chemistry. It is a great way to broaden your perspective, build meaningful connections, and expand your professional network.

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