EMPOWER WITH EVIDENCE

After a year of attending virtual convenings, we've come to appreciate many benefits, but we still long for the things that can only happen in person.

As vaccinations increase, case numbers decline, and states, localities, and institutions begin the process of reopening, we are all left wondering what the newest "new normal" will look like. Like most scientific organizations, we are actively confronting these questions, especially as they relate to our 2022 Annual Meeting.

We write now to share with you some of the preliminary plans for the 2022 meeting, and to ask for your patience and understanding as we work to finalize some of the outstanding details in the months ahead.

- **Philly, here we come!** We invite those who are comfortable doing so to join us February 17-20 in Philadelphia. Our in-person experience will feature live Plenary Lectures, Topical Lectures, special programming, and great social and networking opportunities—all in a city that is ready to welcome visitors—safely—with open arms.
- **Scientific Sessions will be virtual.** To ensure that as many people as possible are able to participate in the Scientific Sessions, they will be entirely virtual. Speakers can participate from wherever they feel comfortable, including Philly. Scientific Sessions will begin in January with the release of Spotlight Videos, which will prepare all meeting participants to engage in active discussion during the live panel sessions.

  For those who join us in Philly, we'll have Community Viewing Pods where attendees can view the Scientific Sessions with friends and colleagues, enabling those spontaneous hallway connections and conversations that we've all missed.
- **A first-rate virtual experience.** Not able to join us in Philly? No problem! You'll be able to participate in all of our Plenary Lectures, Topical Lectures, Scientific Sessions, and Workshops—live!—via a new and improved virtual meeting platform.
- **Deadlines remain the same.** The submission site for Scientific Sessions and Workshops will remain open through June 17. This year's meeting theme "Empower With Evidence" aims to inspire sessions that illustrate the transformative power of evidence-based discoveries and that address the challenges of rebuilding the public trust in science. Meeting registration will open in September.

The Annual Meeting team will continue to work tirelessly to create a convening that features compelling content, powerful professional development, and unparalleled networking opportunities in the safest possible settings.

We look forward to seeing you in Philly or online.

Susan Amara
President, AAAS
Chair, 2022 AAAS Annual Meeting

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Workshop speakers. Top row (L to R): Yigong Shi, Narry Kim, and Ling-Ling Chen. Bottom row (L to R): Reinhard Lührmann, Adrian R. Krainer, and Xiaohua Shen.

Tsinghua–*Science* Workshops: Spliceosomes and RNA

As part of a recent series of online workshops organized by Tsinghua University and Science*/AAAS, an international panel of experts described the latest advances in our understanding of how RNA-protein complexes called spliceosomes play a critical role in disease and viral pathogenesis.*

Spliceosomes play a fundamental role in the production of life-sustaining proteins by accurately splicing pre-messenger RNA (pre-mRNA) into mature mRNA just before it's translated into new proteins. Variations in splicing or errors caused by dysfunctional spliceosomes, however, can also cause deadly diseases.

On December 2, 2020, structural biologist Yigong Shi of Tsinghua University/ Westlake University, China, discussed the role of Prp2, one of the eight ATPase/ helicases involved in spliceosome remodeling. Shi and colleagues analyzed the atomic structure of Prp2 alone and in complexes. They showed that elaborate mechanisms lie behind the impact of spliceosome remodeling on pre-mRNA splicing.

Spliceosome processing goes through several precatalytic stages called complexes, ending with the B complex that is turned into the activated spliceosome. In his presentation, Reinhard Lührmann–a chemist at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany–explained how small nuclear ribonucleoproteins (snRNPs) drive these structural rearrangements. By blocking the spliceosome's assembly at intermediate stages and analyzing them with cryo-electron microscopy, Lührmann and his colleagues determined the structure of two preactivated B complexes. They also revealed how spliceosome proteins participate in the formation of the activated B complex, including a conformational change in Prp8 that is crucial to the folding that activates the complex.

The active spliceosome drives a range of outcomes. As an example, changes in transcripts can accelerate the growth of SARS-CoV-2, as described by virus expert Narry Kim of Seoul National University, South Korea. She and her colleagues sequenced cells infected with the virus to determine the architecture of the transcriptome, particularly the canonical transcripts, which consist of a genomic RNA and nine subgenomic RNAs. Their work revealed that discontinuous mechanisms in translation create a complex transcriptome, which includes the encoding of unknown open reading frames. The team's research also revealed many proteins that impact SARS-CoV-2's growth, and thereby its pathogenicity, through interactions with viral RNA.

Actions of the spliceosome contribute to diseases beyond infectious ones, such as neurodegenerative conditions. At Cold Spring Harbor Laboratory in New York, Adrian Krainer studies ways to repair defects in splicing in neurodegenerative conditions, such as spinal muscular atrophy (SMA). Using antisense approaches for targeted splicing modulation, he helped to develop nusinersen (Spinraza), the first approved drug for SMA. As he explained, nusinersen corrects pre-mRNA splicing, increasing the level of survival motor neuron (SMN) protein, which is reduced in people with SMA. This approach is also promising for treating other neurodegenerative diseases.

In addition to diseases, RNA-based mechanisms participate in the normal developmental complexity of eukaryotes. Xiaohua Shen–an expert in noncoding portions of the genome at Tsinghua University in Beijing, China–described how genetic repeats, noncoding RNA, and RNA-binding proteins participate in the regulation of transcription and genome organization.

Studies of RNA splicing also reveal previously unknown regulators of gene expression. For example, Ling-Ling Chen–an RNA biologist at the Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences–works on circular and long noncoding RNAs (lncRNAs). Distinct pathways produce these forms of RNA. For instance, many lncRNAs are spliced like mRNAs, but some processes lead to circular forms. The action of all these RNAs, including gene regulation, depends on their structure and subcellular location.

Although these experts unveiled many new mechanisms involved in the creation and participation of the spliceosome in healthy and diseased conditions, their work also provided the basis for many more studies. This research will lead scientists even closer to understanding how the spliceosome determines the construction of mRNA and the ultimate production of proteins, and may also help them manipulate that knowledge to treat a range of diseases.

IMAGES PROVIDED BY TSINGHUA UNIVERSITY

May 28, 2021

Stop hate crimes and racism

We are physician and scientist organizations in North America. We vehemently condemn all forms of hatred, violence and racism in our society. While, sadly, these are not new issues, the recent uptick in discrimination and hate crimes against the Asian American and Pacific Islander community is devastating and unsettling to us all as a society.

The increasing hate crimes and violence towards Asian Americans and Pacific Islanders have incited fear and terror within our community. All human beings are free and equal in dignity and rights. No one should have to fear for their safety or be the victims of any kind of physical or emotional attacks due to their physical appearance or cultural and ethnic background. The right to freedom from discrimination is a fundamental human right—one that we must uphold.

Built upon and thriving on immigration, the United States has always been a beacon of hope and justice to attract talented and hardworking immigrants from all over the world. Immigrants and their descendants have been and will continue to make tremendous and incontrovertible contributions to the growth and prosperity of the US. Just for the scientific endeavor alone, over 30% of the Nobel Prize Laureates in the United States during 1901-2013 were born in other countries, including 6 from Greater China, 5 from Japan, and 7 from India[1,2]. Asian Americans and Pacific Islanders are a vital and integral part of this diverse nation.

We call on you to denounce in the strongest terms all forms of discrimination and crimes against any racial/ethnic group, including Asian Americans and Pacific Islanders. We call on you to pursue racial equality and tolerance in the United States and beyond. We call on you to stand strong and together with us.

- American Association of Chinese Rehabilitation Physiatrists (AACRP)
- Asian American Accountable Care Organization (AAACO)
- Asian American Health Center (AAHC)
- Association of Chinese American Physicians (ACAP)
- Association of Chinese Americans in Cancer Research (ACACR)
- Association of Chinese Geneticists in America (ACGA)
- BayHelix Group
- Chinese American Allergy Professionals (CAAP)
- Chinese American BioMedical Association (CABA)
- Chinese American Biopharmaceutical Society (CABS)
- Chinese American Diabetes Association (CADA)
- Chinese American Doctor Association (Greater Baltimore region) (CADA)
- Chinese American Heart Association (CnAHA)
- Chinese American Hematologist and Oncologist Network (CAHON)
- Chinese American Independent Practice Association (CAIPA)
- Chinese American Lung Association (CALA)
- Chinese American Medical Association of California (CAMAC)
- Chinese American Neurological Association (CANA)
- Chinese American Pathologists Association (CAPA)
- Chinese American Society of Anesthesiology (CASA)
- Chinese Biological Investigators Society (CBIS)
- Chinese Biopharmaceutical Association, USA (CBA)
- Chinese Canadian Medical Society B.C. (CCMSBC)
- Chinese Community Accountable Care Organization (CCACO)
- Eastern Chinese American Physicians IPA, Inc. (ECAP)
- Excelsior Integrated Medical Group (EIMG)
- San Diego Chinese American Physicians Association (SDCAPA)
- Sino-American Biotechnology and Pharmaceutical Professional Association (SABPA)
- Sino-American Network for Therapeutic Radiology and Oncology (SANTRO)
- Society for Chinese Neuroscientists (SCN)
- Society of Chinese American Physician Entrepreneurs (SCAPE)
- Society of Chinese Bioscientists in America (SCBA)
- Society of Chinese Bioscientists in America Hematology Division (SCBA HD)
- Washington Association of Chinese American Physicians (WACAP)

References:

1. Institute for Immigration Research, Research brief, November 2013. http://s3.amazonaws.com/chssweb/documents/20864/original/Nobel_Prize_Research_Brief_Final.pdf?1447975594
2. http://www.leadthecompetition.in/GK/nobel-prize-winners-from-india.html

Forging new paths at the intersection of chemistry and materials science

Close to 1,000 scientists attended the virtual Distinguished Lecture Series on Chemistry organized by the Hong Kong Institute for Advanced Study (HKIAS) at the City University of Hong Kong (CityU) during March and April 2021. Discussion topics ranged from the future of printable solar-cell technologies to the role of nanomaterials in developing clean energy solutions.

According to metrics compiled by Stanford University, CityU has over 140 full-time faculty members—eight of whom are HKIAS members—listed among the top 2% of the world's most highly cited scientists, reflecting its excellent academic stature.

Among them are Sir Colin Blakemore, Philippe G. Ciarlet, Way Kuo, Chain-Tsuan Liu, Jian Lu, and David J. Srolovitz (listed alphabetically), who are senior fellows of HKIAS; Tei-Wei Kuo, former visiting fellow of HKIAS; and Jacob C. Huang, executive director of HKIAS. The three speakers of the HKIAS Distinguished Lecture Series on Chemistry are also listed.

A printable green energy source

On March 3, 2021, Alex Jen, Lee Shau-Kee Chair Professor of Materials Science and Chair Professor of Chemistry and Materials Science at CityU, delivered a lecture titled "Printable Solar Cells for Transformative Clean Energy and Sustainable Society."

"Solar power is a potential sustainable solution because it can generate the largest amount of energy," said Jen. "The question is 'do we have enough devices to store or generate the power?'"

He introduced printable solar cells—an innovative energy-saving application—highlighting the advantages of organic solar cells and perovskite solar cells as two significant printable materials with immense potential. Barriers to their application, and possible solutions, were also discussed.

"The applications for printable solar cells are broad, including wearable gadgets and portable power sources," he said, expressing his hope that printable solar cells will be easy to scale up, comparable to printing a newspaper.

The future of nanomaterials

In the second lecture of the series, on March 31, 2021, Hua Zhang, Herman Hu Chair Professor of Nanomaterials at CityU, delivered a lecture titled "Phase Engineering of Nanomaterials (PEN)."

Zhang reviewed his group's recent research on PEN, published in *Nature Reviews Chemistry*, which focuses on the rational design and synthesis of novel nanomaterials with unconventional phases for various promising applications.

In response to a question about how nanomaterials are synthesized, he stressed that conventionally, the control of composition, morphology, size, dimension, and facet is important. By contrast, his group focuses on the phase control of nanomaterials, particularly unconventional crystal phases and amorphous structures.

"Although PEN is still under development, it's an important topic," said Zhang. "Its future applications are diverse, such as in catalysis, surface-enhanced Raman scattering, waveguides, and clean energy."

Finding new material properties

In the final lecture, on April 8, 2021, head of the CityU chemistry department and Chair Professor of Materials Chemistry Chun-Sing Lee delivered a lecture titled "Charge-Transfer Complexes and Their Applications."

Lee described charge-transfer complexes (CTCs): "People define CTCs in different ways, but there is still no agreed-upon definition," he explained. Adopting a simple definition, he called CTCs "a substantial charge transfer between donor and acceptor that achieves different properties from the parents."

Characteristic signatures of CTCs, such as a red-shift and broadened emission and absorption, were introduced. Lee also highlighted how CTCs enhance solar cells and LEDs when applied to these devices. Additionally, he described their wide application in optoelectronic devices, biomedicine, and energy and environment, providing relevant examples.

"The formation of CTCs is a simple way of getting new and unconventional properties from organic materials," he said, stressing their exciting potential in novel applications.

This lecture series at HKIAS is supported in part by the Kwang Hua Educational Foundation, which brings the work of its internally acclaimed scholars to a wide audience of young researchers in order to deepen the academic community's understanding of key areas of scientific endeavor.

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For research on thirst and drinking behavior

Application Deadline
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Christopher Zimmerman, Ph.D.
Princeton Neuroscience Institute
For research on thirst and drinking behavior

応募期限
2021年6月15日

Now It's Your Turn!

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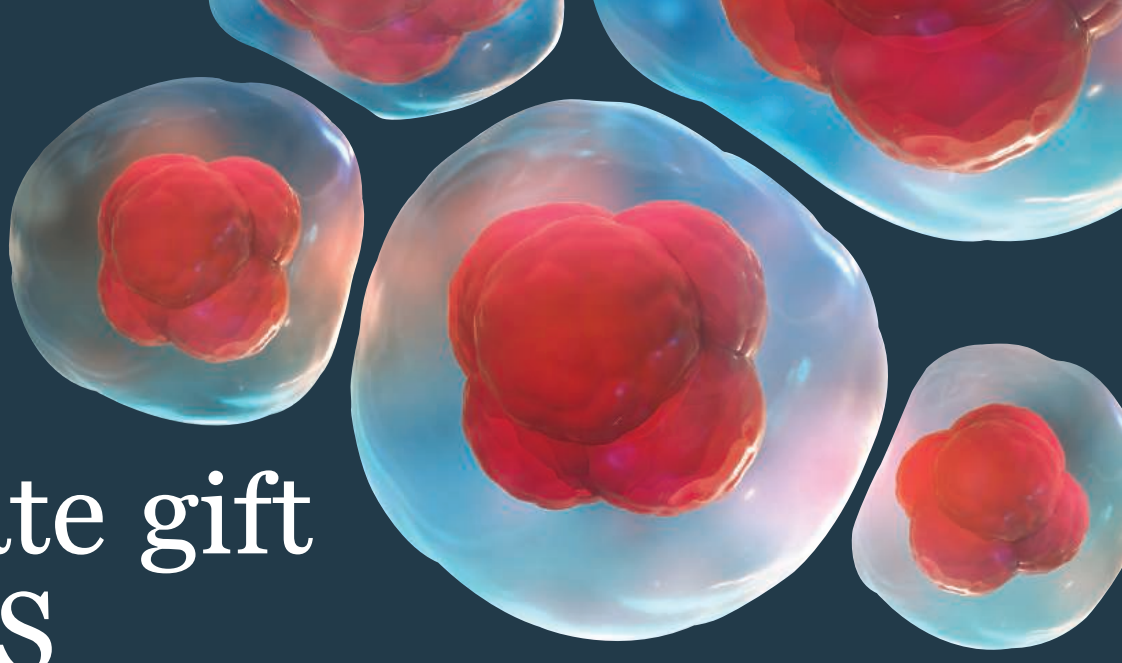

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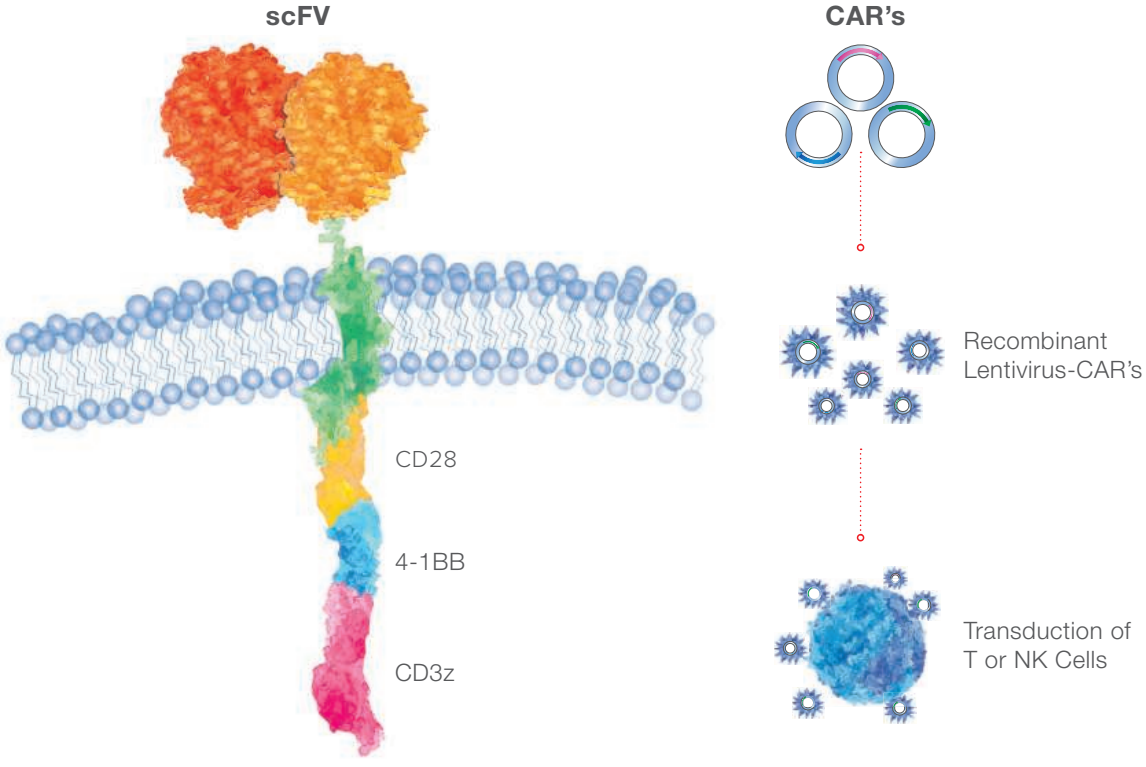

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