AAI NEWSLETTER

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS

DECEMBER 2020

PLAN AHEAD FOR

VIRTUAL IMMUNOLOGY2021™

MAY 10–15, 2021

Great science awaits you online, *page 19*

VIRTUAL IMMUNOLOGY2021™

MAY 10–15, 2021

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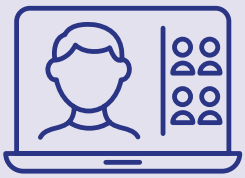

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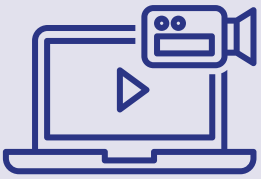

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There has never been a more important time for the immunology community to gather and share the leading science for which our meetings and members are known!

See more details in this issue on pages 19–21.
And look for forthcoming details in your inbox and at www.aai.org!

#AAI2021

The American Association of Immunologists

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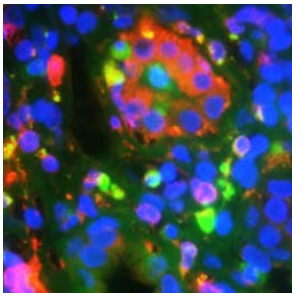

19 Plan Ahead: Virtual IMMUNOLOGY2021™

Connect with AAI!

Do you have a story or a story idea for a future issue of the *AAI Newsletter*? Send us an email! Interested in the latest news from AAI? Keep in touch through our social media channels. Follow us on Twitter, Facebook, or LinkedIn, and keep abreast of daily developments in the world of immunology.

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- **AAINewsletter@aai.org (story ideas and comments about the *AAI Newsletter*)**

AAI Council Welcomes Uli von Andrian

The AAI Council welcomed **Ulrich H. von Andrian, M.D. (AAI '97),** as its newest member following the AAI election earlier this year. Dr. von Andrian's term on the AAI Council began July 1. He will serve as a Council member until 2024, when he will be eligible to stand for election as vice president.

Von Andrian is Edward Mallinckrodt Jr. Professor of Immunopathology and a professor of immunology at Harvard Medical School (HMS) and program leader for basic immunology at the Ragon Institute of MGH, MIT and Harvard. At HMS, he chairs the executive committee of the Immunology Graduate Program and is a faculty member of the Biological and Biomedical Sciences Ph.D. Program and the Committee of Immunology. Von Andrian also heads the HMS Center for Immune Imaging and is a member of the Dana Farber/Harvard Cancer Center.

An AAI member since 1997, von Andrian was an AAI Distinguished Lecturer in 2016 and received the 2007 AAI-BD Biosciences Investigator Award. He directed the AAI Advanced Course in Immunology from 2016 to 2018 and has served during multiple years as a faculty member for both the AAI Introductory and Advanced Courses. Prior to his election to the AAI Council, von Andrian served as an elected member of both the AAI Program and Nominating Committees. He has also participated as a major symposium chair and speaker at AAI annual meetings and serves as an ad hoc reviewer for *The Journal of Immunology.*

"I have always considered AAI my scientific home and, throughout my career, I have benefited from my membership in many ways," wrote von Andrian in his 2020 candidate statement. Service on the AAI Council "offer[s] me the opportunity to pay back and to contribute to our association's future at a time when immunology is literally changing the world. The breathtaking scientific discoveries of immunologists, many of which were first disclosed at AAI meetings and published in AAI journals, are increasingly reshaping the way we treat, prevent, detect, and understand human diseases. In many ways, this is truly a golden age of immunology. Nevertheless, there are numerous challenges, some scientific, many economic, others social and political. I would cherish the opportunity to help address those challenges as a member of the AAI Council.

"The stated mission of AAI is 'dedicated to advancing the knowledge of immunology and its related disciplines, fostering the interchange of ideas and information among investigators, and addressing the potential integration of immunologic principles into clinical practice.' This mission has never been more relevant and timely than in the current COVID-19 pandemic."

Von Andrian's scientific research is focused on the regulation and function of immune cells in health and disease. His laboratory employs intravital microscopy techniques combined with other experimental approaches to study the migration, communication, differentiation, and function of immune cells in living animals. He has long-standing interest in elucidating the mechanisms and consequences of immune cell migration from blood into tissues. To this end, his laboratory has pioneered the use of intravital microscopy to directly visualize and dissect how immune cells interact with their intra- and extravascular environment. His group seeks to characterize processes, such as mucosal imprinting of lymphocytes, that define homing to mucosal sites to better understand factors that influence mucosal imprinting of immune cells and how these factors can be used to design vaccines against mucosal pathogens.

Von Andrian's group also has a long-standing interest in natural killer (NK) cells and discovered a subset of NK cells that has the capacity to mediate long-lived, antigen-specific adaptive immunity. In addition, his group seeks to untangle the cell-fate decision and lineage relationships that underlie the effector-to-memory transition of antigen-experienced T cells and the maintenance of memory subsets in the setting of viral infections. His group identified the chemokine receptor CX3CR1 as a key marker to distinguish three distinct $CD8^+$ T

Dr. von Andrian discusses applying knowledge to human disease in the HMS video series "Science Matters"

effector and memory subsets (negative, intermediate, and high) that differ in phenotypic characteristics, trafficking properties, and specialized functions. This finding has allowed reformulation of the long-held paradigm of central versus effector memory cells by now including the peripheral memory cells that are chiefly responsible for the global surveillance of non-lymphoid tissues.

A further aspect of von Andrian's ongoing work, demonstrating the role of bisphosphonates as vaccine adjuvants, has implications for efforts underway nationally and around the world to develop and widely deploy a COVID-19 vaccine. Commonly prescribed for osteoporosis and shown to enhance the effectiveness of certain vaccines in mice, bisphosphonates could play a role in improving the efficacy and accelerating the deployment of COVID-19 vaccines by making them more effective in smaller doses.

Members of the von Andrian Lab

Von Andrian has served on numerous National Institutes of Health (NIH) study sections and review panels, including on behalf of the National Cancer Institute, National Institute of Allergy and Infectious Diseases (NIAID); National Institute of Arthritis and Musculoskeletal and Skin Diseases; National Institute of Diabetes and Digestive and Kidney Diseases; National Heart, Lung, and Blood Institute; the NIH Director's New Innovator Award; and the NIAID/Division of Intramural Research Board of Scientific Counselors. His additional appointments include service on behalf of the Cancer Research Institute Scientific Advisory Board; Dana Foundation; The Burnham Institute; Broad Foundation; The Wellcome Trust; Israel Science Foundation; Austrian Academy of Sciences; Ludwig-Maximilians-University; and many industry advisory boards, including that of Moderna, among the firms with a COVID-19 vaccine candidate in late-stage clinical trials.

> **[A]t a time when immunology is literally changing the world ... there are numerous challenges, some scientific, many economic, others social and political ... [The AAI] mission has never been more relevant and timely than in the current COVID-19 pandemic.**

Von Andrian holds editorial board appointments on behalf of multiple journals including the *Central European Journal of Biology, Current Immunology Reviews, Immunity, Journal of Biology, Journal of Vascular Research, Open Microbiology Journal,* and *Year in Immunology* (New York Academy of Sciences).

Among the many career honors accorded von Andrian are election to the Henry S. Kunkel Society and the European Academy of Sciences and receipt of awards including the HMS Dean's Award from the Cox Program for Entrepreneurial Initiative, Eugene Landis Award from the Microcirculatory Society, Immunology Frontier Research Center Collaborative Professor Award from Osaka University, Henry Pickering Bowditch Award from the American Physiological Society, Amgen Outstanding Investigator Award from the American Society for Investigative Pathology, and Wiederhielm Award from the Microcirculatory Society.

A native of Munich, Germany, von Andrian received his M.D. from the Ludwig-Maximilians-University, where he also completed a doctoral thesis project in experimental neurology/neurosurgery and received the Dr. med. degree. He undertook internship and residency training in the Department of Surgery, Zentralklinikum Augsburg, Germany; Department of Neurology, University of Michigan Medical Center; and Medizinische Klinik I, Klinikum Großhadern, Munich. He subsequently completed postdoctoral fellowships at the La Jolla Institute for Experimental Medicine and the Laboratory of Immunology and Vascular Biology in the Department of Pathology at Stanford University Medical Center.

Von Andrian joined the HMS faculty as an assistant professor in 1994. He became an associate professor in 1999, a full professor in 2003, and received his Mallinckrodt Professor appointment in 2006.

AAI Leadership Issues Statement on the Politicization of Science

Jenny P. Ting, Ph.D.
President

Ross M. Kedl, Ph.D.
Chair, Committee on Public Affairs

On October 14, the AAI Council and the chair of the AAI Committee on Public Affairs (CPA) issued a statement expressing serious concerns about numerous reports of political interference in scientific decision-making at federal agencies. The full statement is printed on page 7 and can be found on the AAI website at *https://bit.ly/3eOmCjc*.

Note: On October 16, the nonpartisan Government Accountability Office (GAO) agreed to a request by Senators Elizabeth Warren (D-MA), Gary Peters (D-MI), ranking member of the Senate Committee on Homeland Security and Governmental Affairs, and Patty Murray (D-WA), ranking member of the Senate Health, Education, Labor and Pensions Committee, for a GAO review of "whether the CDC and FDA's scientific integrity and communications policies have been violated and whether those policies are being implemented as intended to assure scientific integrity throughout the agency." The review is expected to begin in early 2021.

NIH, Other Agencies, Begin FY 2021 with Flat Funding

On October 1, the first day of fiscal year (FY) 2021, President Donald Trump signed into law a continuing resolution (CR) that funds most federal agencies and programs at last year's levels through December 11, 2020. The CR, which had been approved by the House (359–57) and the Senate (84–10) in late September, was necessary because none of the 12 annual appropriations bills for FY 2021 had been completed.

Under the CR, the National Institutes of Health (NIH) begins FY 2021 with a flat budget of ~$41.7 billion. AAI has recommended, and will continue to advocate for, a $3 billion funding increase for NIH. Though NIH did not receive increased funding in the CR, the new law does contain an important provision that permits NIH to provide no-cost extensions to multiyear grants that were set to expire at the end of FY 2020.

The appropriations bill which funds NIH was approved by the House Labor, Health and Human Services, Education, and Related Agencies (Labor-HHS) Appropriations Subcommittee in July. That measure contains a $5.5 billion funding increase for NIH, including $5 billion in emergency spending. Due in part to their opposition to including emergency spending in a regular appropriations bill, all subcommittee Republicans voted against the measure. A slightly modified version of the subcommittee bill was subsequently approved by the House Appropriations Committee and the full House. Although the Senate, by the time this newsletter went to press, had not completed any of its FY 2021 appropriations measures, the Senate Appropriations Committee had released its draft bills, including the Labor-HHS bill that includes a $2 billion increase for NIH.

AAI is hopeful that Congress and the White House will make significant progress on appropriations during the lame duck session of Congress (the period after the November elections and before the next Congress is sworn in on January 3, 2021), especially on the Labor-HHS bill. Passage of a final appropriations bill is important because a CR may not include the final budget amount, making it difficult for NIH and NIH grantees. Under a CR, many NIH Institutes and Centers set conservative paylines and fund non-competing research grant awards at 90 percent of the previously committed level.

AAI Participates in Virtual Rally Hill Day

AAI cosponsored and participated in the eighth annual Rally for Medical Research Capitol Hill Day (Rally Hill Day), which took place on September 17. The event, which was held virtually for the first time this year, brings together a large coalition of individuals, including scientists, physicians, and patients, to advocate for the shared goal of increasing funding for NIH. More than 500 individuals from over 350 organizations participated in the 2020 virtual event, and meetings were held with congressional offices from all 50 states.

In addition to providing financial support, AAI supported the Rally through the formal participation of AAI CPA Chair Ross Kedl, Ph.D. (AAI '02); CPA member Tullia Bruno, Ph.D. (AAI '17); AAI Director of Public Policy and Government Affairs Lauren Gross, J.D.; and AAI Manager of Science Policy and Legislative Affairs Jake Schumacher. Kedl visited

Continued on page 8

Statement of The American Association of Immunologists (AAI)*

October 14, 2020

The COVID-19 pandemic is one of the gravest public health threats in our lifetime and scientists have risen to the challenge. Immunologists are working around the clock to develop lifesaving treatments and vaccines to combat this disease. The rapid progress that has been made toward achieving these goals is remarkable, but significant scientific and clinical hurdles remain. For scientific advances to benefit the public, scientific and public health experts need the support of the U.S. government and the trust of the American people as we confront the many challenges posed by this virus. It is therefore deeply troubling to see reports of significant and increasing political interference by the Administration in efforts by the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) to keep the public safe. Some CDC attempts to provide evolving information, including about the importance of social distancing and mask wearing, and about the airborne transmissibility of the virus, have reportedly been delayed, altered, or stopped. Recent FDA promises to ensure stringent safety and efficacy standards for drug and vaccine approval have reportedly been met with resistance. If we are to defeat COVID-19 or any future pandemic, it is critically important that our government leaders "follow the science." This requires listening to scientists who are experts in the applicable field and whose recommendations are supported by independent peers, not to scientists/physicians or other individuals who do not have training in the relevant areas. We are very concerned that leading infectious disease, immunology, virology, and public health experts appear to have a diminished role at this critical time in the pandemic. We urge the Administration and Congress to consult them and the excellent scientists at the National Institutes of Health (NIH) and other relevant federal agencies on all decisions related to the science of the pandemic.

While we are optimistic that there will be many new treatments, and eventually, one or more vaccines that will end this long national and international nightmare, we oppose any actions, including political pressure, that would lead to the premature approval of any drug or vaccine candidate. Public confidence in the safety and efficacy of vaccines and therapeutics is as important as their discovery. Actions that are not founded in science to alter scientifically determined timelines or processes will undermine this confidence, increase vaccine hesitancy or refusal, and prolong – or worsen – the pandemic. AAI members will continue to do our part, following the scientific data and doing our very best to save lives. Our success, however, is very much dependent on the support and wisdom of our government leaders.

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Bruno, Gross, and others from the Pennsylvania group met with Liz Barton, Legislative Assistant for Rep. Guy Reschenthaler (R-PA, 14th).

The group from Kentucky met with Rep. John Yarmuth (D-KY, 3rd) (not pictured; joined by phone) and his Legislative Assistant Gil Reyes.

Continued from page 6

the Colorado delegation, Bruno and Gross participated in meetings with members of the House and Senate from Pennsylvania, and Schumacher led meetings of a group from Kentucky. Many other immunologists represented the community as well, including FASEB President and former CPA member Lou Justement, Ph.D. (AAI '91), who visited the congressional delegation from Alabama.

Rally Hill Day participants urged members of Congress to support an NIH funding increase of at least $3 billion for FY 2021, consistent with the AAI funding request. Additionally, they described how they and their colleagues have been impacted by the COVID-19 pandemic and stressed the importance of providing NIH with at least $15.5 billion in supplemental funding in the next COVID-19 relief bill, a request that is strongly supported by AAI.

NIH Releases Final Policy for Data Management and Sharing

The final NIH Policy for Data Management and Sharing (DMS Policy) was released in late October. The DMS Policy requires all NIH-funded researchers to submit a plan at the time of application for how the data they generate will be managed and shared. It will replace the 2003 NIH Data Sharing Policy once it goes into effect on January 25, 2023.

In November 2019, NIH released a draft DMS Policy and sought public comments. AAI submitted comments to NIH agreeing with the principle of and need for data sharing, preservation, and management, but offering numerous suggestions and raising important questions for NIH to consider before moving forward with a final policy. The AAI comments stressed the importance of providing clear definitions of "scientific data," "preliminary analyses," "negative data," and "unpublished data." Other issues raised by AAI included the need to ensure that the policy is not a new unfunded mandate, to establish how it will be monitored and enforced, and to determine what metrics will be used to evaluate its efficacy. To read the AAI comments in their entirety, visit *https://bit.ly/3etVCFc*.

The final policy does define some key terms, including "scientific data," which importantly also describes what the term does not include. The definition reads as follows: "[t]he recorded factual material commonly accepted in the scientific community as of sufficient quality to validate and replicate research findings, regardless of whether the data are used to support scholarly publications. Scientific data ***do not include*** laboratory notebooks, preliminary analyses, completed

case report forms, drafts of scientific papers, plans for future research, peer reviews, communications with colleagues, or physical objects, such as laboratory specimens."

The DMS Policy also includes a section that describes the ways in which compliance will be monitored and enforced during and after the funding period. NIH Institutes, Centers, and Offices (ICOs) will be given the discretion to monitor plans as they see fit, including potentially at the time that progress reports are submitted. After the funding period is over, "non-compliance with the NIH ICO-approved Plan may be taken into account by NIH for future funding decisions for the recipient institution."

On the issue of cost, NIH does include some clarifications, including that personnel costs for activities related to complying with the policy will be allowable in budget requests, as will costs for long-term data preservation and sharing. Meanwhile, metrics to measure the success of this new requirement are not included in the DMS Policy.

NIH Director Francis Collins, M.D., Ph.D., issued a statement in conjunction with the release of the DMS Policy noting, among other things, that NIH will continue to seek input from the biomedical research community as the policy moves toward implementation. AAI looks forward to continuing to work with NIH on this important effort.

AAI Submits Comments Opposing DHS Proposed Rule on International Student and Trainee Visas

AAI recently submitted comments to the Department of Homeland Security (DHS) opposing a proposed rule that would make significant changes to the F (academic student) and J (exchange visitor) visa categories used by many international students and postdoctoral scholars across the country. The comments (printed in full on pages 10–11) were formally submitted by AAI President Jenny Ting, Ph.D. (AAI '97), and CPA Chair Kedl.

Currently, international students and trainees are granted visas for "duration of status," allowing them to remain in the United States until the completion of their studies/training. The proposed DHS rule would dramatically alter this process by eliminating duration of status for the F and J visa categories and instead would award visas for a fixed period of time (no longer than four years). While the proposed policy would allow individuals to apply for extensions of stay, such extensions are not automatically granted. AAI is concerned that this additional burden and the uncertainty of receiving an extension is likely to be a huge deterrent to prospective international students and trainees considering enrolling in programs that are expected to last longer than four years.

Another provision of the proposed rule would place a lifetime cap of three on the number of programs in which an international student (F-1 status) can participate at the same, or a lower, educational level. In its proposed rule, DHS alleges that some students are pursuing additional courses of study "as a de facto way to permanently stay in the United States." The AAI comments express concern that this cap "could impede the careers of young scientists who are increasingly pursuing transdisciplinary programs, or who choose to enroll in multiple advanced degree programs."

More than 32,000 comments on the proposed rule were submitted. At this time, it is not known when the Trump Administration will issue a final rule or when any new policy will be implemented.

AAI Supports Researchers' Effort to Make Diversity Plans Scorable

AAI President Ting, and CPA Chair Kedl recently wrote to NIH to express support for an effort by 47 scientists, including many AAI members and leaders, to "elevate to scorable status the Recruitment and Retention Plan to Enhance Diversity for all new and renewal institutional training grant applications (T32, T35, among others)" and to "extend the Recruitment and Retention Plan to Enhance Diversity to include diversity among training grant program faculty trainers (mentors) as a review criterion" across all NIH Institutes and Centers.

Though developing a Recruitment and Retention Plan to Enhance Diversity is already a requirement for institutional training grants, AAI agrees that elevating it to scorable status is an appropriate and efficient way to ensure that these plans are thoughtfully developed and considered. The AAI letter urges NIH "to adopt the policy as a first step, and in so doing, to provide clear guidance regarding the new scorable category."

Both the AAI letter and the letter containing the original proposal can be viewed here: *https://bit.ly/31lVOBl*.

Trump Administration Suspends Certain Federal Diversity Training Programs

AAI Opposes Administration Action

The Trump Administration recently announced two executive actions that will result in the suspension and possible elimination of many federal diversity and inclusion training programs. The first action, a "Memorandum for the Heads of Executive Departments and Agencies," was issued by the White House Office of Management and Budget (OMB) on September 4 and was followed about three weeks later by an Executive Order entitled, "Combating Race and Sex Stereotyping." The Administration is taking these actions because it alleges that "some Federal worker 'training' sessions are being held–at taxpayer expense–that demonstrably undermine this core American principle [fair

The AMERICAN ASSOCIATION of IMMUNOLOGISTS

October 26, 2020

The Honorable Chad Wolf
Acting Secretary, U.S. Department of Homeland Security
3801 Nebraska Avenue, N.W.
Washington, D.C. 20395

Re: Docket Number ICEB-2019-0006

Dear Secretary Wolf:

The American Association of Immunologists (AAI), the nation's largest professional association of research scientists and physicians who study the immune system, appreciates this opportunity to comment on the proposed rule issued by the Department of Homeland Security (DHS) on September 25 ("Establishing a Fixed Time Period for Admission and an Extension of Stay Procedure for Nonimmigrant Academic Students, Exchange Visitors, and Representatives of Foreign Information Media"). We strongly oppose this proposed rule, as we believe it would damage the U.S. biomedical research enterprise by placing an unnecessary and deleterious burden on international students and postdoctoral scholars who are in the U.S. under the F academic student or J exchange visitor nonimmigrant visa categories.

Under the current policy, these visas are valid for "duration of status," allowing those who continue their education and follow all immigration rules to stay in the U.S. as long as necessary to complete their studies/training. This new policy would fundamentally change the visa process, doing away with "duration of status" and instead establishing fixed admission periods of no longer than four years. While the policy does permit these visa holders to apply for extensions of stay, there is no guarantee that such extensions would be granted. Given that doctoral students who completed their degrees in 2018 needed a median number of 5.8 years to earn their doctorates [per the National Science Foundation (NSF)], imposing a four year limit would undoubtedly adversely impact the willingness of international students to pursue their studies in the U.S. In addition, by requiring visa holders to apply for needed extensions, the proposed rule would impose additional burden and costs on both nonimmigrants and the U.S. institutions where they study or train.

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AAI is also concerned that this policy, like any that deters promising international students in Science, Technology, Engineering, and Mathematics (STEM), from studying in the U.S., would cause serious harm to both universities and the biomedical research workforce. According to the Institute of International Education, 1.1 million international students studied at U.S. higher education institutions in 2018/2019, representing 5.5% of those enrolled at these institutions. While these students help create a vibrant and diverse atmosphere on campuses, many stay in the U.S. as researchers or teachers and contribute importantly to our economy and to American innovation. NSF recently found that, "[a]mong temporary visa holders who received their S&E [Science & Engineering] doctoral degrees approximately 5 and 10 years prior to 2017, nearly three-quarters remained in the United States in 2017." These "stay rates" are a very positive indicator of the commitment that these students have to our nation. In addition, it is our experience that many of those who leave the U.S. go on to form valuable collaborations with U.S. researchers, who led the world in 2015 in publications co-authored with international partners (see study published in *Scientometrics*).

Another provision of concern would place a lifetime limit of three on the number of educational programs that F-1 visa holders can complete at the same, or a lower, educational level. This could impede the careers of young scientists who are increasingly pursuing trans-disciplinary programs, or who choose to enroll in multiple advanced degree programs.

While AAI recognizes the government's desire to ensure compliance with U.S. immigration policy, we understand that adequate safeguards are already in place, as visa applicants and visa holders are carefully screened and monitored through the DHS's Student and Exchange Visitor Information System.

AAI believes that it is crucial to the success of the U.S. biomedical research enterprise to foster a diverse research workforce, promote international scientific collaboration, and attract the best and brightest international students and scientists. Any action, including this proposed rule, that impedes any of these vital goals is counterproductive to advancing biomedical research, improving the health of Americans and people around the world, and maintaining our nation's global preeminence in science.

Please feel free to contact Lauren Gross, AAI Director of Public Policy and Government Affairs (lgross@aai.org), or us if AAI can be of any further assistance on this important matter.

Sincerely,

Jenny P. Ting, Ph.D.
President

Ross M. Kedl, Ph.D.
Chair, Committee on Public Affairs

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and equal treatment of all individuals] by stereotyping and scapegoating certain groups of people."

Under these new directives, federal agencies are being asked to identify all training programs that relate to diversity and inclusion, determine the spending allocated to these programs, and identify those training sessions that teach "divisive concepts." Some of the keywords and phrases that agencies are advised to look for include "critical race theory," "white privilege," "intersectionality," "systemic racism," "positionality," "racial humility," and "unconscious bias." Those training programs deemed to be divisive by the Office of Personnel Management will be eliminated.

AAI was one of 50 organizations to co-sign a letter led by the American Institute of Physics urging OMB "to rescind its elimination of federal employee training programs related to diversity, equity, and inclusion" (see letter here: *https://bit.ly/35e9LSZ*). AAI will closely monitor how these executive actions are implemented, particularly at the NIH.

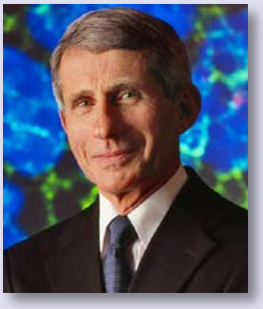
AAI Joins Effort Calling for Study of Systemic Racism in Academia

AAI co-signed a September letter to Representative Eddie Bernice Johnson (D-TX, 30th), chair of the House Committee on Science, Space and Technology, supporting her call for a National Academies of Science, Engineering, and Medicine (NASEM) study on systemic racism in academia (see letter here: *https://bit.ly/2HhObVs*). The letter, which was initiated by the American Physiological Society, a fellow FASEB member, was co-signed by 80 organizations.

NASEM has yet to receive federal funding for the project. Although Rep. Johnson successfully amended an appropriations bill, subsequently passed by the House, to provide NASEM with $1.5 million for the study, the bill's fate in the Senate is uncertain.

Fauci Honored for Career Service, Leadership During COVID-19 Pandemic

Anthony S. Fauci, M.D., FAAI (AAI '73), has been named one of *Time* magazine's 100 Most Influential People of 2020 for his leadership in helping guide the nation's response to the COVID-19 pandemic while informing the public with candor and persistent focus on factual, science-based information. His courage and integrity in resisting pressure to politicize the pandemic, and his wisdom drawn from advising six U.S. presidents over 36 years as a world leader in basic and applied infectious diseases research, have earned him the trust of people throughout the country and around the world.



Additionally, **Dr. Fauci** has been named by the nonpartisan Partnership for Public Service as the 2020 Federal Employee of the Year, the top honor of the Samuel J. Heyman Service to America Medals® (Sammies). Recognizing his role as the nation's premier expert and spokesperson on infectious diseases, the award honors Fauci's leadership of the federal government's research response to infectious diseases over the course of six administrations, his spearheading of efforts to develop COVID-19 treatments and vaccines, and his steady counsel to the public on how to navigate the deadly health crisis wrought by the disease.

Fauci has also received dual honors from the National Academy of Medicine (NAM), the first as recipient of the inaugural NAM Presidential Citation for Exemplary Leadership, in recognition of his extraordinary service and outstanding contributions to biomedical science, health care, and public health in the United States. The award cites Fauci's pioneering advances in the field of human immunoregulation and lifesaving therapies for rare immune disorders; seminal research and groundbreaking leadership in prevention and treatment of HIV/AIDS, impacting countless lives now and in the future; enduring, visionary guidance to the field of biomedical research globally and nationally; unprecedented public service as director of the National Institute of Allergy and Infectious Diseases (NIAID) for nearly four decades; distinguished service as a trusted advisor to six U.S. presidents during public health crises including HIV/AIDS, SARS, anthrax, influenza, and Ebola; and firm and steady leadership during the COVID-19 pandemic, offering an unwavering, trusted voice to the nation and world on behalf of science-based policy and public health.

The NAM has also honored Fauci as 2020 recipient of the Gustav O. Lienhard Award for Advancement of Health Care, for his role as a leader of federal research and policy on infectious diseases and, in particular, his deft, scientifically grounded leadership in shaping an effective response to the COVID-19 pandemic.

Fauci has served as NIAID director at the National Institutes of Health (NIH) since 1984 and as chief of NIAID's Laboratory of Immunoregulation since 1980. As a member of the White House Coronavirus Task Force, Fauci has worked vigorously and persistently to provide accurate and balanced information to the public about the COVID-19 pandemic.

From his turns at the White House podium to media interviews and beyond, Fauci has been a steady hand in helping guide the administration, policymakers, and the public, providing honest assessments and detailed evaluations in a rapidly changing environment. His efforts to promote social distancing, correct misinformation, and provide impartial advice to state and local leaders across the country have reassured an anxious nation and led to the adoption of sound policies that, where implemented and enforced, have flattened the COVID-19 curve. At the same time, he has spearheaded the ramping up of NIAID research activities to respond to the pandemic.

During his career, Fauci has made fundamental contributions to basic and clinical research on the pathogenesis and treatment of immune-mediated diseases while helping to pioneer the field of human immunoregulation. His seminal findings have helped elucidate the immunopathogenic mechanisms of HIV infection, and his research remains focused in part on understanding the pathobiology of the body's immune responses to the AIDS retrovirus. He has been instrumental in developing strategies for the therapy and immune reconstitution of AIDS patients and continues to lead the pursuit of a vaccine to prevent HIV infection.

As an advisor to the White House and Department of Health and Human Services on global AIDS issues, Fauci was one of the principal architects of the President's Emergency Plan for AIDS Relief, which has been responsible for saving millions of lives throughout the developing world.

Subsequently, Fauci has led the federal government's effort to develop programs and infrastructure to support biodefense research while overseeing initiatives to bolster medical and public health preparedness and expand research capacity related to pandemic influenza and other emerging infectious diseases.

Fauci was named to the inaugural class of Distinguished Fellows of AAI in 2019; the honor recognizes 25-year and longer AAI members for distinguished careers and outstanding scientific contributions as well as service to AAI and the immunology community. In 2005, he received the AAI Lifetime Achievement Award, one of the highest honors bestowed by the AAI Council upon an AAI member, in recognition of his career of scientific achievement and contributions to AAI and fellow immunologists. In 2000, Fauci was honored as the AAI Public Service Award recipient for his extraordinary leadership in advocating for biomedical research and advancing immunology.

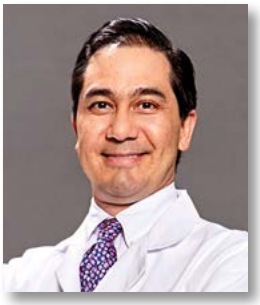
Fauci is a past chair of the AAI Program Committee and past member of the AAI Clinical Immunology Committee. He has also served as an associate editor and reviewer for *The Journal of Immunology (The JI)* and as a major symposium speaker and scientific and policy session panelist at AAI annual meetings. During the upcoming **Virtual IMMUNOLOGY2021™,** Fauci will be the keynote speaker at a special session on COVID-19 and the science of pandemics.

Five Elected to National Academy of Medicine

Mark S. Anderson, M.D., Ph.D. (AAI '04), Dan H. Barouch, Ph.D., M.D. (AAI '06), Yolonda L. Colson, M.D., Ph.D. (AAI '93), Melody A. Swartz, Ph.D. (AAI '14), and **David S. Wilkes, M.D. (AAI '00),** have been elected as members of the National Academy of Medicine.

Dr. Anderson is a professor and the Friend Endowed Chair in Diabetes Research at the University of California, San Francisco School of Medicine. His research focuses on the genetic control of autoimmune diseases. His laboratory showed the importance of the autoimmune regulator (AIRE) gene in immune tolerance and its role in the development of the human autoimmune syndrome called Autoimmune Polyglandular Syndrome Type 1. He also investigates the pathogenesis of autoimmune diabetes and develops experimental models of autoimmune disease.

Anderson served as a faculty member for the 2020 AAI Virtual Advanced Course in Immunology and is a past member of the AAI Membership Committee. He has also served as an associate editor and ad hoc reviewer for *The JI*.



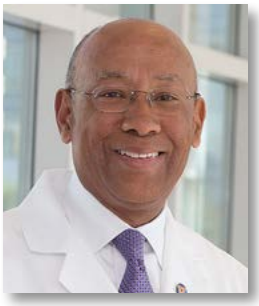
Dr. Barouch is the William Bosworth Castle Professor of Medicine at Harvard Medical School; director of the Center for Virology and Vaccine Research at Beth Israel Deaconess Medical Center; and a member of the Ragon Institute of MGH, MIT and Harvard. Barouch's laboratory studies HIV-1 infection with the goal of developing novel vaccine and treatment strategies. He has advanced a series of adenovirus vector-based HIV-1 vaccine candidates from concept to phase 1 clinical trials currently in progress. He and his lab colleagues have also applied their vaccine expertise to other infectious diseases, including Zika virus, tuberculosis, and, most recently, SARS-CoV-2.

Barouch is a past major symposium speaker at the AAI annual meeting and has served as a member of the AAI Advanced Course faculty and as an associate editor and ad hoc reviewer for *The JI*.

Dr. Colson is the Hermes C. Grillo Professor of Surgery at Harvard Medical School, chief of thoracic surgery at Massachusetts General Hospital, and a member of the Dana-Farber/Harvard Cancer Center Cancer Immunology Program. Colson specializes in the surgical treatment of lung cancer with a specific interest in improving its identification and treatment. Her research focuses on the development of polymer and nanoparticle drug delivery to prevent cancer recurrence, and on novel methods to identify tumor that has spread to nearby lymph nodes.

Dr. Swartz is the William B. Ogden Professor and deputy dean for faculty affairs in the Pritzker School of Molecular Engineering at the University of Chicago, where she is also a professor in the Ben May Department for Cancer Research. Swartz uses a variety of interdisciplinary approaches to elucidate how the lymphatic system regulates immunity in homeostasis and disease, particularly in cancer and chronic inflammation. Her laboratory investigates the immunological implications of lymphangiogenesis, functions of the lymphatic endothelium, and novel strategies for targeting the lymphatics for immunotherapy.

Swartz is a past major symposium speaker at the AAI annual meeting and has served as an ad hoc reviewer for *The JI*.



Dr. Wilkes is the dean of the University of Virginia School of Medicine, where he also serves as the James Carroll Flippin Professor of Medical Sciences. His research is focused on the immune mechanisms leading to allograft destruction. His laboratory has examined the role of type V collagen in lung allograft rejection with the goal of developing therapeutic modalities to improve survival of transplant recipients.

Wilkes has served as a major symposium chair and speaker at the AAI annual meeting.

Tait Wojno and Zhong Are Milstein Awardees

Elia Tait Wojno, Ph.D. (AAI '14), and **Zhenyu Zhong, Ph.D. (AAI '11),** have been named Seymour and Vivian Milstein Young Investigator Award recipients for 2020. Presented by the International Cytokine and Interferon Society, the award recognizes scientists for their notable, early-career contributions to interferon and cytokine research.

Dr. Tait Wojno is an assistant professor in the Department of Immunology at the University of Washington. Her research focuses on dissecting innate and adaptive immune responses following helminth parasite infection and during allergy, with an emphasis on cytokines and prostaglandins. Her lab also investigates how the Notch signaling pathway regulates basophil gene regulation and function in the setting of helminth infections and how helminth, bacterial, and viral infection, together with regulation of gene transcription, shape immunity to infections.

Tait Wojno serves as an ad hoc reviewer for *The Journal of Immunology.* She is a two-time recipient of the AAI Junior Faculty Travel Award and a past recipient of the AAI Trainee Abstract Award.

Dr. Zhong is an assistant professor in the Department of Immunology at UT Southwestern Medical Center, where his research focuses primarily on innate immunity. During his postdoctoral training, Zhong's research contributed to establishing mitochondria as the command center for innate immunity. Currently, work in his lab focuses on understanding how mitochondria in myeloid cells sense tissue damage, initiate inflammatory responses, and orchestrate tissue repair/regeneration to restore tissue homeostasis.

Zhong is a past recipient of the AAI Trainee Achievement Award and a two-time recipient of the AAI Trainee Abstract Award.

Lucas Receives 2020 Fleischmann Award for Young Women Investigators

Carrie L. Lucas, Ph.D. (AAI '16), has been named by the International Cytokine and Interferon Society as 2020 recipient of the Christina Fleischmann Award for Young Women Investigators. Dedicated to the memory of outstanding interferon research scientist Christina Fleischmann, the award recognizes and promotes young women scientists who have made notable contributions in cytokine, chemokine, or interferon biology research.

Dr. Lucas is an assistant professor of immunobiology at Yale School of Medicine. Her laboratory investigates signaling in T cells from healthy people and patients with inherited immune disorders to dissect pathways critical for adaptive immunity. A major focus of her work has been on phosphoinositide 3-kinase (PI3K) signaling and mechanisms of disease in immunodeficient patients with activating mutations in PI3K subunits.

Lucas is a member of the ad hoc AAI Travel for Techniques Award Committee and served as a faculty member for the 2020 AAI Virtual Advanced Course in Immunology. She has also served as an AAI Committee on the Status of Women/ Education Committee Careers Roundtable discussion leader at the AAI annual meeting. Lucas is the recipient of multiple AAI awards, including the Travel for Techniques Award, AAI-Life Technologies Trainee Achievement Award, Ray Owen Young Investigator Award, and three Trainee Abstract Awards.

Vance Is 2020 Coley Award Co-Recipient

Russel E. Vance, Ph.D. (AAI '10), has been named a 2020 co-recipient of the William B. Coley Award for Distinguished Research in Basic and Tumor Immunology. The award recognizes scientists for seminal discoveries in the fields of basic immunology and tumor immunology that have deepened understanding of the immune system's response to cancer and advanced the development of effective cancer immunotherapies.

Dr. Vance and his award co-recipients are being honored for their individual contributions to the discovery and characterization of the cGAS-STING pathway, an important component of the innate immune system that currently is being used in the development of novel immunotherapies against cancer.

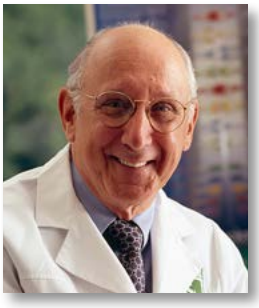
Vance is a professor of immunology and pathogenesis and a Howard Hughes Medical Institute investigator in the Department of Molecular and Cell Biology at the University of California, Berkeley. His research seeks to understand how the innate immune system detects the presence of infectious microbes. Using multiple experimental techniques involving structural biology, biochemistry, genetics, and in vivo studies, Vance and his team dissect the fundamental mechanisms that provide host defense against bacterial infection and by which pathogens evade host immunity and cause disease. Particular interests of the group include focus on pathogen sensors situated in the cytosol of host cells and how the immune system detects pathogen-encoded activities.

Vance is a past major symposium chair and speaker at AAI annual meetings.

Vance's Coley Award co-recipients include Andrea Ablasser, M.D., Glen N. Barber, Ph.D., Zhijian J. Chen, Ph.D., and Veit Hornung, M.D.

Rosenberg Is 2020 Lloyd J. Old Award Honoree

Steven A. Rosenberg, M.D., Ph.D. (AAI '72), has been honored by the American Association for Cancer Research and the Cancer Research Institute as 2020 recipient of the Lloyd J. Old Award in Cancer Immunology. The award recognizes scientists whose outstanding and innovative research has had a major impact on the cancer field and has the potential to stimulate new directions in cancer immunology. Rosenberg's honor reflects his seminal discoveries that led to the first effective cancer immunotherapy, interleukin-2 (IL-2), and the first adoptive cell transfer immunotherapies for both solid and blood cancers, including genetically modified T cells.



Dr. Rosenberg is chief of surgery at the National Cancer Institute (NCI), NIH, where he serves as head of the Tumor Immunology Section at the NCI Center for Cancer Research. He is also professor of surgery at the Uniformed Services University of the Health Sciences and the George Washington University School of Medicine and Health Sciences.

Dr. Rosenberg pioneered the development of several types of immunotherapies for patients with advanced cancers, including treatment with high-dose IL-2 and T cell transfer immunotherapy. His lab pioneered the development of gene therapy and was the first to successfully insert foreign genes into humans. Through his research aimed at cancer antigens that are recognized by patients' lymphocytes, Rosenberg identified antitumor T cell receptors that can be exploited for cell transfer immunotherapy. He described the

successful use of chimeric antigen receptor (CAR) T cells that recognized CD19 for the treatment of patients with advanced lymphomas. These discoveries were confirmed by other independent groups and this therapy received a Breakthrough Therapy designation from the U.S. Food and Drug Administration. More recently, he developed a procedure to evaluate the immunologic reaction against all mutations present in patients' cancers and to target unique neoantigens in a highly personalized immunotherapy.

A member of the National Academy of Medicine and recipient of numerous career award honors, Rosenberg was the 2019 recipient of the AAI-Steinman Award for Human Immunology Research. He has served as an associate editor for *The JI* and as a major symposium speaker at the AAI annual meeting.

Alfano Named a Dean's Scholar at Wash U.

Danielle N. Alfano, M.D. (AAI '17), has been named an inaugural Dean's Scholar by the recently formed Division of Physician-Scientists at Washington University School of Medicine, St. Louis (Wash U). The program provides up to two years of financial support and mentorship to aspiring, early-career physician–scientists, along with dedicated time for conducting laboratory research.

Dr. Alfano is an instructor of pediatrics in the Division of Newborn Medicine at Wash U. Her research focuses on exploring the molecular pathways of pathogens involved in sepsis. She is particularly interested in examining the interaction between pathogens and ADAM10 in endothelial cells.

AWARDS

AAI Announces Fall 2020 Travel for Techniques Awardee

AAI is pleased to announce the most recent AAI Travel for Techniques Awards recipient, selected from among applicants during the program's Fall 2020 application cycle.

The AAI Travel for Techniques Program assists AAI members (regular or associate) who are principal investigators seeking to expand their skill sets to benefit their research. Selected applicants may choose to use the award to travel themselves or assign the award to another investigator or trainee in their labs. AAI reimburses award recipients as much as $1,500 in travel expenses incurred on a trip to another laboratory to learn a technique.

AAI extends congratulations to:

Jay Reddy, M.V.Sc., Ph.D. (AAI '09)
Professor, University of Nebraska, Lincoln

Designated Traveler: Mahima Rasquinha (AAI '20), graduate student

Destination: The laboratory of Dr. Christopher M. Staley, University of Minnesota

Technique: Characterization of gut microbiota by next-generation sequencing analysis

Application: To investigate the role of dysbiosis in the development of inflammatory cardiomyopathy

Travel for Techniques Award applications are reviewed in three cycles annually—winter, spring, and fall. AAI is accepting applications for the winter cycle from December 15, 2020, through February 17, 2021.

Details on applying for the AAI Travel for Techniques Award are available at *www.aai.org/TravelforTechniques*.


PLAN AHEAD FOR
VIRTUAL
IMMUNOLOGY2021™
Information to help you make the most of the first-ever online AAI annual meeting!

Plan Ahead for VIRTUAL IMMUNOLOGY2021™

MARK YOUR CALENDAR!

IMMUNOLOGY2021™ will be held May 10–15, 2021, online for the very first time! The 105th AAI annual meeting will feature incredible science that registrants can access from the comfort, convenience, and safety of their own home, office, or lab.

Attendees will be able to access recordings of sessions after the end date of the meeting. Unlike onsite meetings, this removes the limitations of having to choose which sessions to attend. Instead, you will have access to the program as it suits your schedule!

Intense planning has resulted in an event featuring high-quality interactive content. More details will be provided as they become available. For the most up-to-date information, please visit *www.IMMUNOLOGY2021.org* to explore the scientific program, abstract submission and abstract-driven sessions, career-advancement sessions and events, social events, virtual exhibit hall, registration, and more. You can also download, print, email, and share the **Virtual IMMUNOLOGY2021™** Call for Abstracts.

MAKE THE MOST OF ATTENDING VIRTUAL IMMUNOLOGY2021™

Attendees may think that they will not learn as much from an online conference as they would in person. **Virtual IMMUNOLOGY2021™** may look a little different, but there are many ways to prepare for getting the most out of your virtual experience!

BEFORE

Organize your session schedule.

Just as with an on-site meeting, it's critical with a virtual meeting to plan ahead and choose which sessions you want to watch live and which you can opt to watch later. Maximize your time and learning by reviewing and selecting sessions and events in advance.

Prioritize your time.

Make the best use of your time by focusing your attention. Don't try to multitask during a session. Set reminders for sessions so you don't miss something important.

Minimize distractions.

Set up in a quiet space and take steps to prevent interruptions, whether you are at home or the office: silence your phone, block off your calendar, and put a "Do not Disturb" message on so you can fully focus.

Familiarize yourself with the tools.

Don't miss something because of faulty technology. Be sure to test your audio and ensure a strong WiFi signal before the meeting starts. For the best experience, use a desktop or laptop computer instead of your smartphone.

Make sure you are receiving the latest Virtual IMMUNOLOGY2021™ information.

Attendees should make sure that AAI has their current email address. You can also follow AAI on Facebook, Twitter, and LinkedIn for the latest annual meeting information.

DURING

Be an active participant.

Plan to participate beyond listening. Take notes. Ask questions during the live sessions. Connect on social media by using meeting hashtags, live chats, and other tools.

Build your virtual community.

You may be used to networking at an in-person meeting, but how do you network virtually? Search for #AAI2021 on Twitter and LinkedIn to connect with others who are attending the meeting or to engage with their posts. Use tools available through the virtual platform to participate. Attend the virtual social events offered.

Involve your peers.

Do you know others who are attending **Virtual IMMUNOLOGY2021™?** Plan to meet with them virtually to discuss the sessions you've attended. This can help with comprehension and allow you to compare key takeaways.

Visit the Virtual Exhibit Hall.

Learn more about a research tool or technique by visiting the virtual exhibits. Just like with on-site AAI annual meetings, the Virtual Exhibit Hall is an excellent chance to learn about the latest technologies and products.

Don't forget to take breaks.

Just as you need breaks at in-person events, you need to take time during virtual meetings to get up, walk around, stretch, and take a coffee break.

Practice good virtual meeting etiquette.

If attendee participation is available, always turn your sound off unless invited to speak. This practice is considerate to both the presenter and your fellow attendees.

AFTER

Take advantage of on-demand options.

Registrants will have the opportunity to view sessions after the meeting. Take notes. Debrief with fellow attendees and peers. Reach out to speakers you are watching. Keep the conversation going by sharing key takeaways on your social media platforms.

Don't forget to **HAVE FUN!**

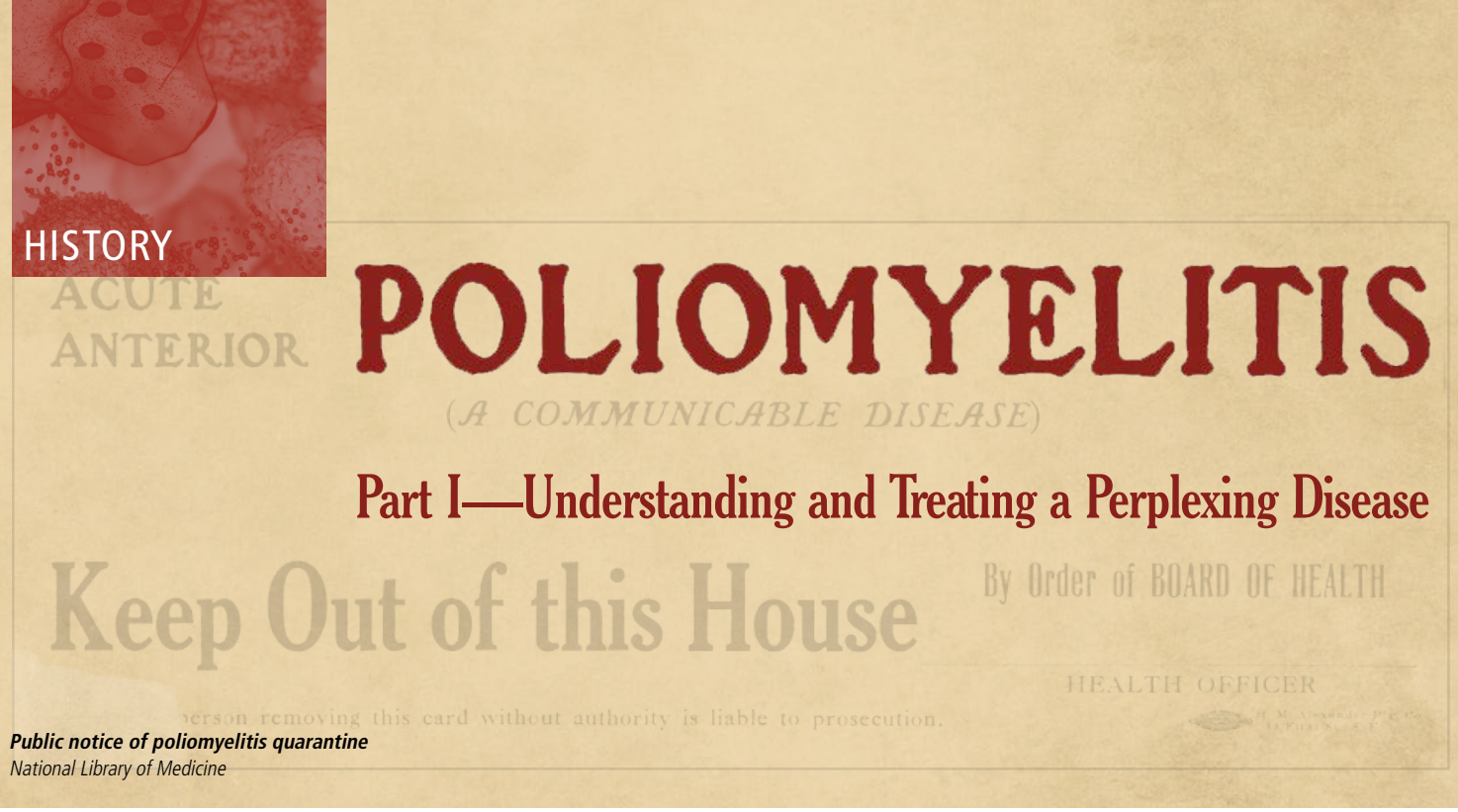
The AAI annual meetings are a yearly celebration of immunology. While your main reason for attending is to learn and connect, we hope you will also truly enjoy all that is offered!

#AAI2021

HISTORY

POLIOMYELITIS

Part I—Understanding and Treating a Perplexing Disease



Public notice of poliomyelitis quarantine
National Library of Medicine

In the late 19th century, sporadic outbreaks of a perplexing and debilitating disease began to appear in both the United States and Europe. Most of those affected, primarily young children, would experience a fever and perhaps some pain or stiffness and then recover. But in a small percentage, the disease would progress to paralysis of legs or the diaphragm, sometimes leading to death. Poliomyelitis, or simply polio, presented medical researchers and early immunologists with special problems that grew more urgent as outbreaks became epidemics and the effects of the disease more severe. From its inception, *The Journal of Immunology (The JI)* published some of the most important research on the nature of polio, ultimately leading to the successful vaccines of the 1950s.

The Discovery of Viruses

Although polio seemed like a new plague at the dawn of the 20th century, evidence of its paralytic effects can be traced to ancient Egypt and ancient Greece. This disease was rare and, to all appearances, random and therefore not well understood until shortly after the discovery of viruses in the late 19th century.

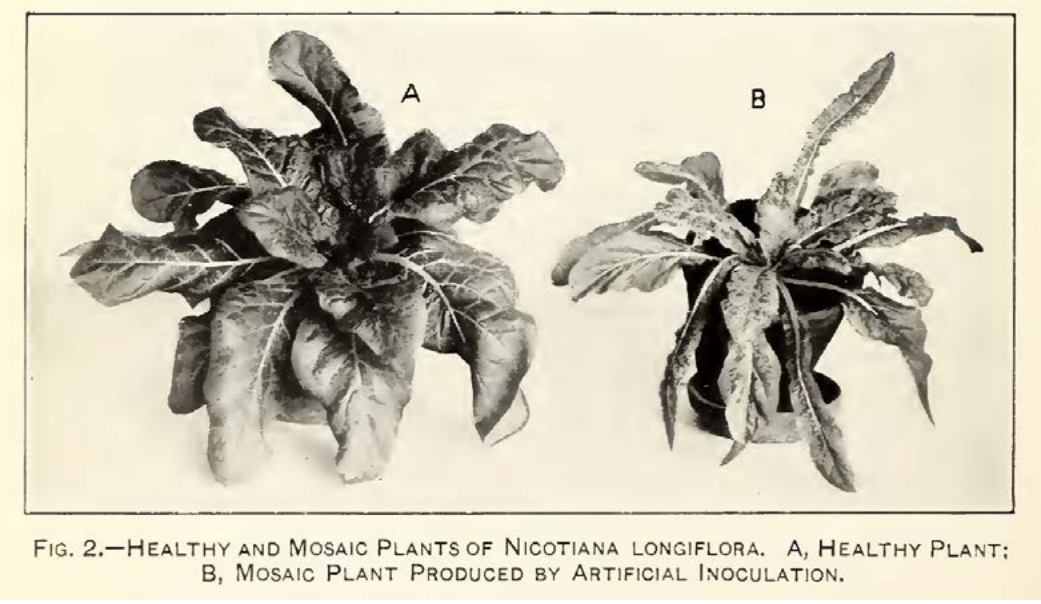


FIG. 2.—HEALTHY AND MOSAIC PLANTS OF NICOTIANA LONGIFLORA. A, HEALTHY PLANT; B, MOSAIC PLANT PRODUCED BY ARTIFICIAL INOCULATION.

Tobacco mosaic virus symptoms, 1914
U.S. Department of Agriculture

Bacteria were first seen by the naked eye with the invention of the microscope by Antonie Van Leeuwenhook in 1668; soon thereafter the field of bacteriology was born. Virology came much later because the causative agents could not be seen even under the highest powered light microscope.

The term virus ("poison" in Latin) had been used for centuries to describe medical maladies for which the cause was mysterious. The imprecision of the

term, however, would end with the 1898 discovery of the tobacco mosaic virus (TMV), an infectious agent that could be spread through the sap of the tobacco plant.[1] The experiment underlying the discovery was rather straightforward and owed its success to the porcelain Chamberland filter, which had pores so small that a solution that passed through it would be bacteria free.

Typically, the filter was used to strain out bacteria to be tested. However, when a pasteurized aqueous solution containing crushed-up leaves of diseased tobacco plants was forced through the filter, the remaining solution could still infect tobacco plants. Though the TMV was not seen, nor could it be grown in laboratory cultures, it was the first "filterable virus" to be isolated.[2]

Many more viruses were soon isolated. The first vertebrate virus, foot-and-mouth, was isolated in 1898, and the first human virus, yellow fever, was isolated in 1900. And in 1935, Wendell M. Stanley (AAI 1957) was the first to crystalize a virus—the TMV—and demonstrated that it was composed of protein and ribonucleic acid. He was awarded the Nobel Prize in Chemistry in 1946 for his research.

Polio Outbreaks

In the mid-1800s, doctors were reporting clusters of infantile paralysis during the summer months in the United States and Western Europe, though the clusters were so small and sporadic that uncovering a clinical diagnosis for the disease was impossible. The first epidemic in the United States occurred in the Otter Valley of Vermont during the summer of 1894.

Charles Caverly
Rutland Herald

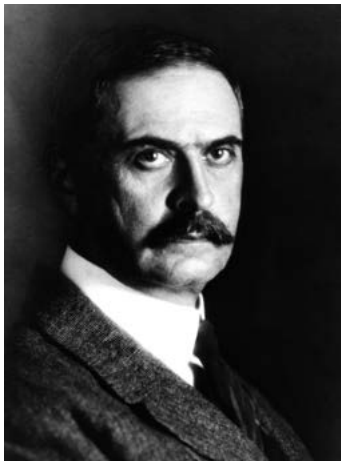
Charles Caverly, a diligent local doctor, was able to trace the 123 people comprising the Vermont cases and noted the sex, age, symptoms, and outcome for each. Though unable to determine the cause of the disease, he laid the groundwork by reaching three important conclusions: polio had the potential to become an epidemic; most of the victims were children, not infants, thus "infantile paralysis" was a misnomer; and some victims experienced an extremely mild form of illness with minor symptoms and a quick recovery.[3]

In July 1904, the world's first major epidemic of polio began in Sweden. The countryside around Stockholm had seen outbreaks of polio sporadically over the previous three decades, with the most recent in 1895. The 1904 epidemic began in a small village 155 miles southwest of Stockholm. Within three months, cases had been reported in nearly every county in the country. In August alone, 360 cases were reported, and by year's end there was a total of 1,031.[4]

A majority of the cases became the subject of a comprehensive survey by Ivar Wickman, who crisscrossed the country to get detailed accounts from victims and families. His conclusions reinforced Caverly's hypotheses, vastly expanding the understanding of the disease: it was spread through personal contact; all infected persons, symptomatic and asymptomatic, were contagious; and the incubation period for first symptoms was three to four days after infection and a further six to eight days for paralysis.[5]

The number of polio epidemics increased in number and severity into the 20th century, and with each epidemic, understanding of the disease increased incrementally. The causative agent, however, remained a mystery.

The Polio Virus



Karl Landsteiner
National Library of Medicine

On December 18, 1908, Karl Landsteiner (AAI 1922, president 1927–28) rose to give a talk at the Royal and Imperial Society of Physicians in Vienna. The topic of his talk was polio, and he was there to announce that he had isolated the filterable virus responsible for the disease. Landsteiner had taken a sample from the inflamed spinal cord of a child recently claimed by the disease, ground it up in sterile water, and injected it into guinea pigs, rabbits, and mice to no avail. Then he injected samples into the abdomen of two monkeys. The first died after eight days, and the second became paralyzed from the waist down before dying on Day 18 post-infection. The spinal cords of both monkeys exhibited the telltale lesions of polio. Further research using filtrates yielded identical results. The polio virus had been isolated.[6]

Flexner and Early Polio Research in the United States

Back in the United States, Simon Flexner (AAI 1920), the director of the recently opened Rockefeller Institute for Medical Research (RIMR) and editor-in-chief of the *Journal of Experimental Medicine,* had begun his own polio research. By 1907, the country was also experiencing an increase in outbreaks both in number and severity during the summer months. That year, New York City health officials reported 2,000 cases, and similar outbreaks were reported in Massachusetts, Minnesota, Nebraska, Ohio, Wisconsin, and Vermont.[7]

Simon Flexner
National Library of Medicine

Brooklyn, NY, 1914
New York Historical Society

Later, after successfully reproducing Landsteiner's work, Flexner began a series of experiments to determine where the virus entered the body. And like Landsteiner and many other researchers, Flexner was using a monkey model for the disease.

This choice in model had its positives and negatives. Monkeys were able to be infected by polio, though not naturally. Like today, they were expensive and difficult to buy and maintain; by contrast, at the time of Flexner's research, the origins and previous conditions of the monkeys were usually completely unknown.

Flexner's research into the entry point for the virus began with feeding his test subjects poliovirus by mouth. None got sick. Next, he introduced the virus into their sinuses by using a swab dipped in filtrates and watched as the monkeys soon became sick. Flexner reasoned, incorrectly as it turned out, that the virus entered through the nose and traveled into the central nervous system.[8]

By 1911, an optimistic Flexner was quoted in the *New York Times* saying, "We have already discovered how to prevent infantile paralysis" and that the "achievement of a cure, I may conservatively say, is not now far distant."[9]

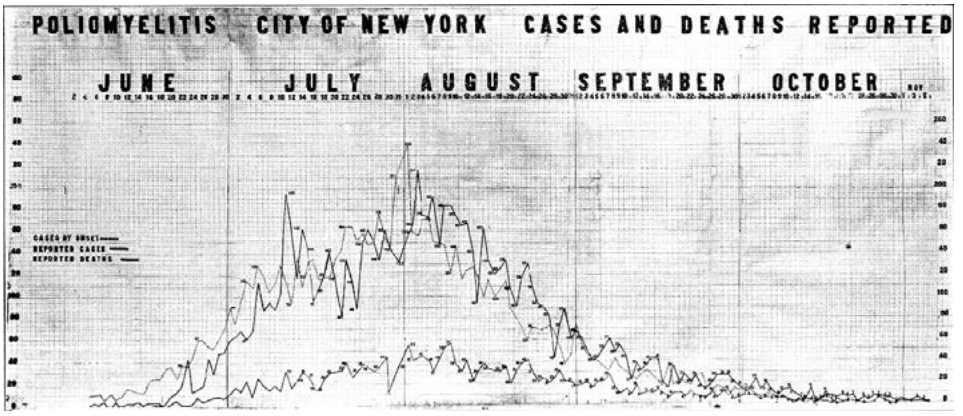
What later research would show was that, unbeknownst to Flexner, his selection of a *Macaca mulatta* (rhesus monkey) was the fatal flaw in his research because that species is unable to orally contract polio.[10]

The 1916 Polio Epidemic

The year 1915 proved relatively unremarkable for New York City public health officials; in terms of public health, the numbers were very similar to those in 1914. While deaths brought on by the prevailing endemic communicable diseases remained relatively constant in 1915, the maladies remained a daily threat to the nearly five million residents of the city. The top pathogen-related deaths included pneumonia (10,692), tuberculosis (10,321), diphtheria (1,271), measles (662), influenza (394), whooping cough (395), typhoid fever (327), and scarlet fever (310). There were no vaccines or effective therapeutics for any of these, and readily available laboratory testing existed for only a few.[11]

The biggest event in the city that year was the women's suffrage parade down Fifth Avenue on October 23. The official counts for the gathering ranged from 25,000 to 60,000 participants and at least 100,000 spectators. Polio would have caused little worry to residents of the city's five boroughs, young or old, as only 70 deaths had been attributed to the disease in the entire state.

Across the United States in 1915, only 691 reported deaths were caused by polio, of which the vast majority were children under the age of five. As winter waned into the spring of 1916, there was no warning that New York City was soon to become ground zero for the first major outbreak of polio in America.



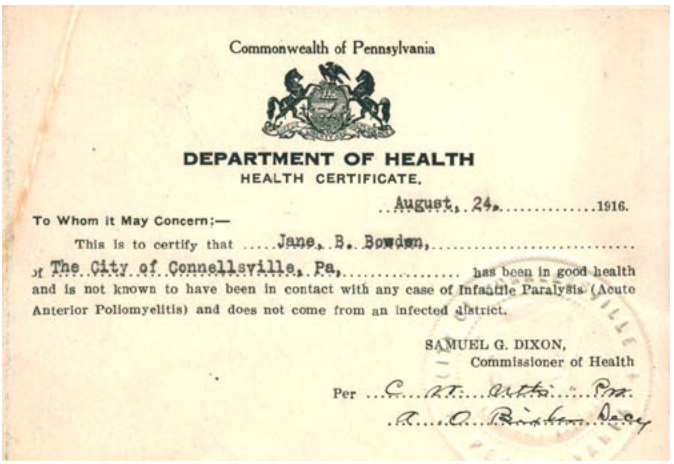
1916 New York polio epidemic chart
New York Dept. of Health, 1917

The first issue of *The JI* came out just three months before cases of polio started appearing in May of 1916 in a densely populated section of Brooklyn known as Pigtown. By year's end, the disease would claim the lives of more than 6,000 people, mostly children, and leave another 21,000 with permanent physical disability. This first major American epidemic of polio hit the New York City area hardest: about 9,000 children were affected, and 2,343 of them died.[12]

At the time, very little was known about how polio was transmitted or how to prevent infection. Because only about one percent of infected patients experience paralytic symptoms, the virus seemed less contagious than it actually was, and public health officials had difficulty identifying routes of transmission.[13] Medical and government authorities instituted sanitation drives, food inspections, and even travel bans for children.[14] Treatment options were limited during the epidemic as well. By the time polio had caused paralysis in a child, all a physician could do was prescribe medication to treat the pain and fever.[15] The iron lung had not yet been developed to treat cases of respiratory paralysis.

A Catalyst for AAI Researchers

Many of the earliest AAI members would have witnessed the New York polio epidemic firsthand. Thirteen members, including Arthur F. Coca (AAI 1916, EIC 1916–1935), William H. Park (AAI 1916, president 1918–19), James W. Jobling (AAI 1914, president 1915–16), and Richard Weil (AAI 1914, president 1916–17), lived in New York City during the summer of the outbreak. Another six New Yorkers would join AAI in the ensuing year, including Hans Zinsser (AAI 1917, president 1919–20) and Peter K. Olitsky (AAI 1917).


Commonwealth of Pennsylvania

DEPARTMENT OF HEALTH
HEALTH CERTIFICATE.

August, 24, 1916.

To Whom it May Concern:—

This is to certify that Jane, B. Bowden, of The City of Connellsville, Pa, has been in good health and is not known to have been in contact with any case of Infantile Paralysis (Acute Anterior Poliomyelitis) and does not come from an infected district.

SAMUEL G. DIXON,
Commissioner of Health

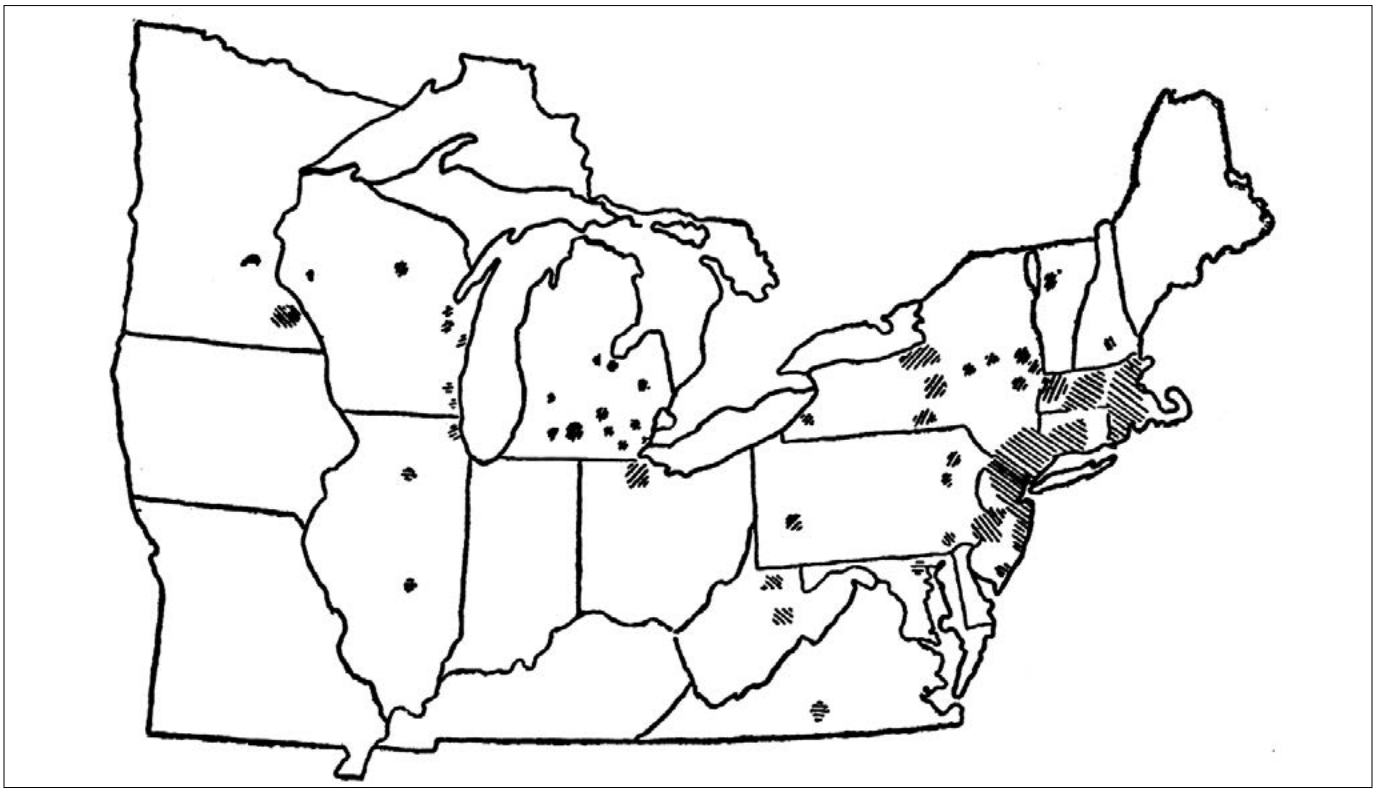
Per C. R. Metz, M.D.

A. C. Bingham, M.D.

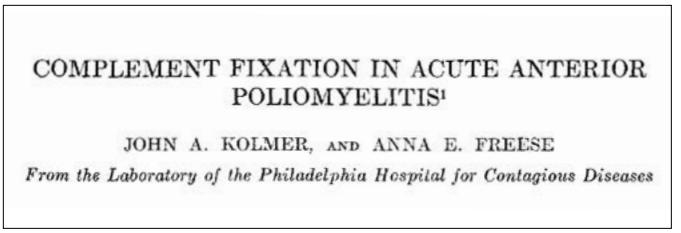
A polio health pass was required in some states due to travel restictions, 1916
Smithsonian, National Museum of American History

The 1916 epidemic inspired new research on polio, and in its early years, *The JI* published important articles that built on the previous discoveries of Landsteiner and Flexner. At this point, it was still very challenging to work with polio because the virus could not be successfully cultured in vitro. Monkeys were the only experimental animal that the virus would reliably infect, making experiments expensive as well.

John Kolmer (AAI 1913, president 1917–18) published the first article on polio in *The JI* with Anna E. Freese. Hoping



Areas particularly involved in the poliomyelitis epidemic of 1916
Public Health Reports, *June 29, 1917*



COMPLEMENT FIXATION IN ACUTE ANTERIOR POLIOMYELITIS[1]

JOHN A. KOLMER, AND ANNA E. FREESE

From the Laboratory of the Philadelphia Hospital for Contagious Diseases

First article on polio in *The JI*
The Journal of Immunology, *April 1, 1917*

that a complement-fixation diagnostic could be developed for polio as had been done for syphilis, they used samples of cerebrospinal fluids and blood sera from patients in different stages of polio infection to determine (1) whether specific antigen could be detected in corresponding tissues, and (2) whether antibodies for "various and easily cultivated" bacteria could be demonstrated. Unfortunately, their research showed that the Wassermann reaction was uniformly negative for acute anterior poliomyelitis.[16] They found that though there was some evidence of complement fixation with polio serum, the reactions were too insignificant to be used as a practical diagnostic.[17]

Seeing similarities between the polio and rabies viruses, H. L. Abramson (AAI 1918) and Herman Gerber of the New York Department of Health tried to produce a vaccine based on those analogous properties. They conducted experiments to determine if a highly potent strain of polio isolated at RIMR could be attenuated either chemically or with heat, as with rabies.

Attenuation with formalin proved "decidingly not encouraging," so they turned to heating methods.[18] Abramson and Gerber showed in monkeys that a course of five injections of the heat-treated virus over five days could produce substantial immunity to the potent virus when introduced later.

A Return to Polio Research

Polio continued to plague American children: 1921 and 1925 had significant spikes in cases and deaths, and 1927 was the worst year since 1916.[19] After a gap of almost 10 years, polio research in *The JI* picked up again with wide-ranging approaches to understanding immunity to the disease. In 1927, W. Lloyd Aycock and J. R. Kagan reviewed the state of polio vaccine science and showed that it was possible to produce immunity without active symptoms.[20]

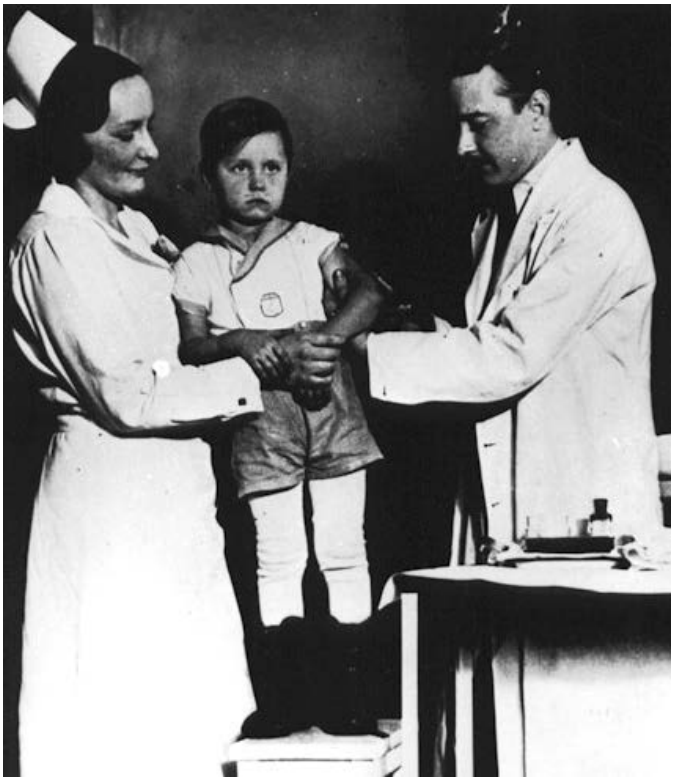
The Kolmer and Brodie Vaccine Trials

By 1934, research had advanced sufficiently to make the first serious human trials possible. As in the case of the competing Salk and Sabin vaccine efforts that would come later, two scientists independently developed initial polio vaccines, one using killed virus and one using attenuated.

John Kolmer attenuated the virus with sodium ricinoleate to produce a vaccine.[21] Monkey tests looked promising, so he then tested his vaccine on himself and his assistant with no ill effects. Kolmer quickly moved to tests on children. His own sons received it first, and then he distributed it to physicians across the country. In September 1935, he reported that 10,725 children had been given the vaccine, and none who had received all three doses had contracted polio. There were, however, nine cases in children who had only one or two doses.[22]

Also in 1934, Maurice Brodie (AAI 1934) began work on a polio virus in the Bureau of Laboratories of the New York Department of Health under William H. Park. Using formalin-killed virus, he produced humoral immunity in monkeys reliably, but tissue immunity in only a few (a live virus had the opposite ratio). The common belief at the time was that tissue immunity was the more important component of protection from the virus.[23] Like Kolmer, Brodie swiftly moved to human trials on more than 4,500 children. He also reported five cases of polio among the vaccinated subjects, but two of those children had been exposed just prior to receiving the vaccine, and another only 13 days after getting just a single dose.[24]

Now there were two vaccines that offered the promise of bringing an end to the scourge of polio. Sidney Kramer made a large comparative study to verify efficacy of these two vaccines, funded partly by the President's Birthday Ball Commission for Infantile Paralysis Research, the original precursor to the March of Dimes.[25] The study showed that neither vaccine was significantly more effective than a



John Kolmer injecting his son with polio vaccine, 1935
Detroit News

control. Kramer cited private correspondence in which Kolmer said that he no longer believed that sodium ricinoleate actually attenuated the virus.

At the 1935 American Public Health Association annual conference, both vaccines were denounced as ineffective or dangerous. Brodie acknowledged the failure of his work in person.[26] Ultimately, however, Brodie's vaccine did produce immunity in children comparable to the natural immunity of adults (75 percent), but the concerns raised in 1935 by the scientific community effectively barred further research at the time.[27] Much later research suggests that the cases of polio in children who received Kolmer's vaccine may have been provoked by the monkey spinal cord antigens, which were present due to the production method of the vaccine and not from the introduced virus itself.[28]

In the ensuing years, polio remained a significant problem in the United States, with most years seeing 4,000 to 10,000 cases. The numbers began skyrocketing in 1943, but by that time the outbreak of the Second World War had funneled research away from diseases such as polio in favor of studies addressing the immediate needs of the war.

In the next issue of the AAI Newsletter, *we will pick up the story of polio as it played out in the postwar years, as growing outbreaks spread to more cities and suburbs. Our focus will be on the basic research that made effective polio vaccines possible.*

Reference

1 Dmitri Ivanovski (occasionally spelled Iwanovski), a Russian botanist, and Martinus Beijernick, a Dutch microbiologist and botanist, are independently given credit for the isolation of TMV. For more details about their research on TMV, see Greer Williams, *Virus Hunters* (New York, Alfred A. Knopf, 1959), 73–87, and Michael B.A. Oldstone, *Viruses, Plagues, and History: Past, Present, and Future* (New York, Oxford University Press, 2010) 15–16.

2 What we simply call a virus today was initially called a "filterable virus," owing to the use of the Chamberland filter to isolate TMV and in an attempt to give precision to the new concept.

3 David M. Oshinsky, *Polio: An American Story* (New York: Oxford University Press, 2005), 11.

4 Gareth Williams, *Paralyzed with Fear: The Story of Polio* (New York: Palgrave Macmillian, 2015), 13–15.

5 Williams 15.

6 Williams 23–24.

7 Oshinsky 16.

8 Simon Flexner and Paul A. Lewis, "The Transmission of Acute Poliomyelitis to Monkeys," *Journal of the American Medical Association* 53 no. 20, 1639; "The Transmission of Acute Poliomyelitis to Monkeys: A Further Note," *Journal of the American Medical Association* 53 no. 23, 1913.

9 "Near to a Cure for Infantile Paralysis," *New York Times,* March 9, 1911, 5.

10 Oshinsky 18.

11 U.S. Department of Commerce, Bureau of the Census, *Mortality Statistics, 1915, Sixteenth Annual Report* (Washington, DC: Government Printing Office, 1917) 316–7. In 1916, deaths due to the same diseases were relatively consistent: pneumonia (10,079), tuberculosis (9,736), diphtheria (1,039), measles (556), influenza (548), whooping cough (386), and scarlet fever (121).

12 Laurel Iverson Hitchcock and Paul H. Stuart, "Pioneering Health Care for Children with Disabilities: Untold Legacy of the 1916 Polio Epidemic in the United States," *Journal of Community Practice* 25, no. 1: 90.

13 Naomi Rogers, *Dirt and Disease: Polio Before FDR* (New Brunswick: Rutgers, 1992), 38.

14 Hitchcock and Stuart 92.

15 Naomi Rogers, "Dirt, Flies, and Immigrants: Explaining the Epidemiology of Poliomyelitis, 1900–1916," *Journal of the History of Medicine and Allied Sciences* 44, no. 4: 487.

16 The Wasserman reaction (or Wasserman test), initially developed in 1906 as a test for syphilis, measures antibody to a nontreponemal lipid antigen and was soon recognized to be able to produce a positive reaction to other diseases, such as polio.

17 John A. Kolmer and Anna E. Freese, "Complement Fixation in Acute Anterior Poliomyelitis," *The Journal of Immunology* 2, no. 3: 327–39.

18 H. L. Abramson and Herman Gerber, "Active Immunity in Experimental Poliomyelitis," *The Journal of Immunology* 3, no. 6: 435–51.

19 Barry Trevelyan, Matthew Smallman-Raynor, and Andrew D. Cliff, "The Spatial Dynamics of Poliomyelitis in the United States: From Epidemic Emergence to Vaccine-Induced Retreat, 1910–1971," *Annals of the Association of American Geographers* 95, no. 2: 276.

20 W. Lloyd Alcock and J. R. Kagan, "Experimental Immunization in Poliomyelitis," *The Journal of Immunology* 14, no. 2: 85–99.

21 John A. Kolmer and Anna M. Rule, "Concerning Vaccination of Monkeys Against Acute Anterior Poliomyelitis, with Special Reference to Oral Immunization," *The Journal of Immunology* 26, no. 6: 505. Lawrence B. Berk, "Polio Vaccine Trials of 1935," *Transactions & Studies of the College of Physicians of Philadelphia* Ser. 5, vol. 11, no. 4: 327.

22 John A. Kolmer and Anna M. Rule, "Active Immunization Against Acute Anterior Poliomyelitis with Ricinoleated Vaccine," *The Journal of Immunology* 32, no. 5: 341.

23 Berk 329–30.

24 Berk 331.

25 S. D. Kramer, "Active Immunization against Poliomyelitis. A Comparative Study I. Attempts at Immunization of Monkeys and Children with Formalized Virus," *The Journal of Immunology* 31, no. 3: 167–182; "Active Immunization against Poliomyelitis. A Comparative Study II. Experimental Immunization of Monkeys with Virus Treated with Sodium Ricinoleate," *The Journal of Immunology* 31, no. 3: 183–89.

26 Berk 333.

27 Berk 335.

28 H. V. Wyatt, "Poliovaccines: Lessons Learnt and Forgotten," *History and Philosophy of the Life Sciences* 17, no. 1: 93.

AAI Grants and Awards 2021

January 20

AAI Public Policy Fellows Program

- **Prize/Award:** Up to 10 year-long fellowships through which participants explore how federal legislative action and agency activities impact the conduct and funding of biomedical research and how AAI works with, and on behalf of, AAI members for the best possible outcome; participants travel to Washington, DC, for a two-day program on Capitol Hill and participate in AAI public affairs activities at the AAI annual meeting
- **Eligibility:** Early-career AAI member researchers who are within 15 years of having received their terminal degree and are committed to a career in biomedical research and to learning about and participating in the public policy and legislative activities of AAI
- **Details:** *www.aai.org/PPFP*
- **Contact:** *jschumacher@aai.org*

February 15

AAI Travel for Techniques Awards

- **Prize/Award:** Multiple awards providing up to $1,500 each in reimbursement of travel expenses for a visit to another laboratory, specifically to learn a technique beneficial to the award applicant's research
- **Eligibility:** AAI regular and associate member scientists with independent research programs; awarded travel may be that of the applicant, applicant's trainee, or applicant's lab member (traveler must be an AAI member); award selection is based on relevance of the technique to the applicant's program and financial need
- **Details:** *www.aai.org/TravelforTechniques*
- **Contact:** (301) 634-7178; *awards@aai.org*

March 15

AAI Careers in Immunology Fellowships

- **Prize/Award:** Multiple awards in support of the laboratories of AAI member principal investigators (PIs), each providing one year's salary for a graduate student or postdoctoral fellow working in the PI's lab
- **Eligibility:** Any AAI member principal investigator with less than $350,000 (excluding PI salary) in annual direct costs who seeks salary support for an AAI member trainee working in the PI's lab
- **Details:** *www.aai.org/CIFP*
- **Contact:** *fellowships@aai.org*

March 15

AAI High School Teachers Summer Research Program in Immunology

- **Prize/Award:** Multiple awards providing high school science teachers with the opportunity to participate in a four- to six-week, hands-on summer research experience in the lab of an AAI member; program provides stipend, assistance from an educational consultant in developing an innovative classroom curriculum to be shared nationally, support to attend a national professional meeting to present program experiences, and support to attend the three-day AAI Introductory Course in Immunology, Part I, to learn the basic principles of the discipline
- **Eligibility:** High school teachers seeking creative ways to bring the excitement of cutting-edge research and discovery to their classrooms while developing their ability to cultivate the next generation of talented biomedical investigators and enhance public understanding of the critical nexus between basic research and human health
- **Details:** *www.aai.org/HSTProgram*
- **Contact:** (301) 634-7826; *infoaai@aai.org*

About the 2021 AAI Career Awards

Due to the cancellation of IMMUNOLOGY2020™, members selected for 2020 AAI Career Awards will be honored during **Virtual IMMUNOLOGY2021™.** The next AAI Career Awards nomination cycle will open in Fall 2021.

Non-AAI Grants and Awards

Visit the AAI website at *www.aai.org/GrantsAwardsDeadlines* for information about non-AAI grants and awards programs, including these with impending deadlines:

2020

December

- AFAR Glenn Foundation for Medical Research Breakthroughs in Gerontology (BIG) Award (December 15)
- DOD Congressionally Directed Medical Research Program: Prostate Cancer Research Program (December 15)

2021

January

- Burroughs Wellcome Fund Postdoctoral Enrichment Program (January 14)
- Cancer Research Institute Lloyd J. Old STAR Program (January 15)
- National Science Foundation Research Coordination Networks in Undergraduate Biology Education (January 19)
- AFAR Glenn Foundation for Medical Research Postdoctoral Fellowships in Aging Research (January 25)
- Japan Prize (January 31)
- L'Oreal USA Fellowships For Women In Science (January 31)

February

- AMGEN Scholars Program (early February)
- Cancer Research Institute Clinic and Laboratory Integration Program (CLIP) (February 1)
- Lasker Awards (February 1)
- AFAR Paul Beeson Emerging Leaders Career Development Award in Aging (February 3)
- Burroughs Wellcome Fund Innovation in Regulatory Science (February 12)

March

- FASEB Excellence in Science Award (March 2)
- Keio Medical Science Prize (March 7)
- Global Probiotics Council Young Investigator Grant for Probiotics Research (March 15)
- Zuckerman Postdoctoral Scholarships (March 15)

MEETINGS AND EVENTS

Mark Your Calendar for These Important Dates!

Dear readers, please note that at press time the meetings listed on these pages were still scheduled as shown. However, changes and/or cancellations may occur. Please check an individual meeting's website to confirm the details.

2021

VIRTUAL MEETINGS

January–March
Keystone eSymposia on Cellular and Molecular Biology
www.keystonesymposia.org/ks/online

February 8–11
2021 American Association for the Advancement of Science (AAAS) Annual Meeting
www.aaas.org/events/2021-aaas-annual-meeting

February 22–24
2021 SITC Cancer Immunotherapy Winter School
www.sitcancer.org/winterschool

February 22–26
BPS2021: 65th Biophysical Society Annual Meeting
www.biophysics.org/2021meeting#/

April 27–30
Experimental Biology 2021
www.experimentalbiology.org

May 10–15
Virtual IMMUNOLOGY2021™ AAI Annual Meeting
www.IMMUNOLOGY2021.org

Dates TBA
American Association for Cancer Research (AACR) Annual Meeting 2021
www.aacr.org/meeting/aacr-annual-meeting-2021/

ON-SITE MEETINGS

May 16–19
The 40th Annual Meeting of the American Society for Reproductive Immunology (ASRI)
La Fonda on the Plaza, Santa Fe, NM
https://theasri.org/santa-fe-2021/

June 3–7
American Society for Microbiology (ASM) Microbe 2021
Anaheim, CA
https://asm.org/Events/ASM-Microbe/Home/ASM-Statement-on-COVID-19

Fall 2021 (exact dates TBA)
4th International Conference on Innate Lymphoid Cells (ILC4 2020)
Palace Hotel, San Francisco, CA
www.ilc2020.org

September 1–4
ECI 2021: 6th European Congress of Immunology—European Federation of Immunological Societies (EFIS)
Belgrade Sava Center, Belgrade, Serbia
http://eci2021.org/

September 22–25
54th Annual Meeting of the Society of Leukocyte Biology (SLB): Immunometabolism—Fueling the Flame of Aging, Cancer and Immunity
InterContinental Cleveland Hotel & Conference Center, Cleveland, OH
https://www.leukocytebiology.org/future-slb-meetings

October 3–6
17th International Workshop on Langerhans Cells and Related Myeloid Cells of the Skin
Jerusalem, Israel
www.lc2021.org

October 17–20
Cytokines 2021: 9th Annual Meeting of the International Cytokine and Interferon Society (ICIS)
Cardiff, Wales, UK
https://cytokinesociety.org/meetings/future-meetings/

November 8–12
15th International Congress of Neuroimmunology, International Society for Neuroimmunology (ISNI), 3rd Global Schools of Neuroimmunology Pre-Course
Nice, France
www.isniweb.org/isni-nice-2020/

2022

January 22–25
60th Midwinter Conference of Immunologists
Asilomar Conference Grounds, Pacific Grove, CA
www.midwconfimmunol.org/

AAI Programs to Benefit Your Lab's Current or Future Research

AAI Careers in Immunology Fellowship

KEY DATES	APPLICATIONS OPEN	APPLICATIONS CLOSE
	JANUARY 15	**MARCH 15**

These fellowships provide AAI member PIs with one year of salary support for a graduate student or postdoctoral fellow in their labs. Member PIs in good standing with less than $250,000 (excluding PI's salary) in annual direct costs are eligible to apply.

Selection is based on the potential of the trainee, merit of the project, quality of the training environment, and financial need.

Direct inquiries to fellowships@aai.org.

AAI Travel for Techniques Award Program

AWARDS CYCLE	APPLICATIONS OPEN	APPLICATIONS CLOSE
WINTER	**DECEMBER 15**	**FEBRUARY 15**
SPRING	**APRIL 15**	**JUNE 15**
FALL	**AUGUST 15**	**OCTOBER 15**

The Travel for Techniques Award is given to member PIs, reimbursing up to $1,500 in expenses for travel to learn a new technique. Member PIs in good standing with less than $250,000 (excluding PI's salary) in annual direct costs are eligible to apply.

Direct inquiries to awards@aai.org.

If the application deadline falls on a weekend day or a federal holiday, applications will be due on the next regular business day.

The American Association of Immunologists provides robust support for scientists through an array of fellowships, career awards, and travel grants. For more information, visit www.aai.org/awards.

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS
1451 Rockville Pike, Suite 650, Rockville, MD 20852

AAI *COVID-19 Resources and Information* Web Page

In response to the global coronavirus pandemic, AAI has established a *COVID-19 Resources and Information* page on its website to assist the immunology community in accessing essential pandemic resources, including articles and other information of interest to scientists and the public.

Resources and information that can be found include:

- **Links to WHO and CDC websites**
- **AAI response to the crisis**
- **AAI members making news**
- **NIH alerts, clinical trials, and initiatives**
- **selected references and studies**
- **a global COVID-19 daily tracker**
- **and more**

Visit the *COVID-19 Resources and Information* web page at www.aai.org/COVID-19-Resources.

AAI members are invited to submit stories of their research and other efforts related to COVID-19 for inclusion on this page. Please send your stories to bcoulter@aai.org. Inclusion will be at the discretion of AAI.