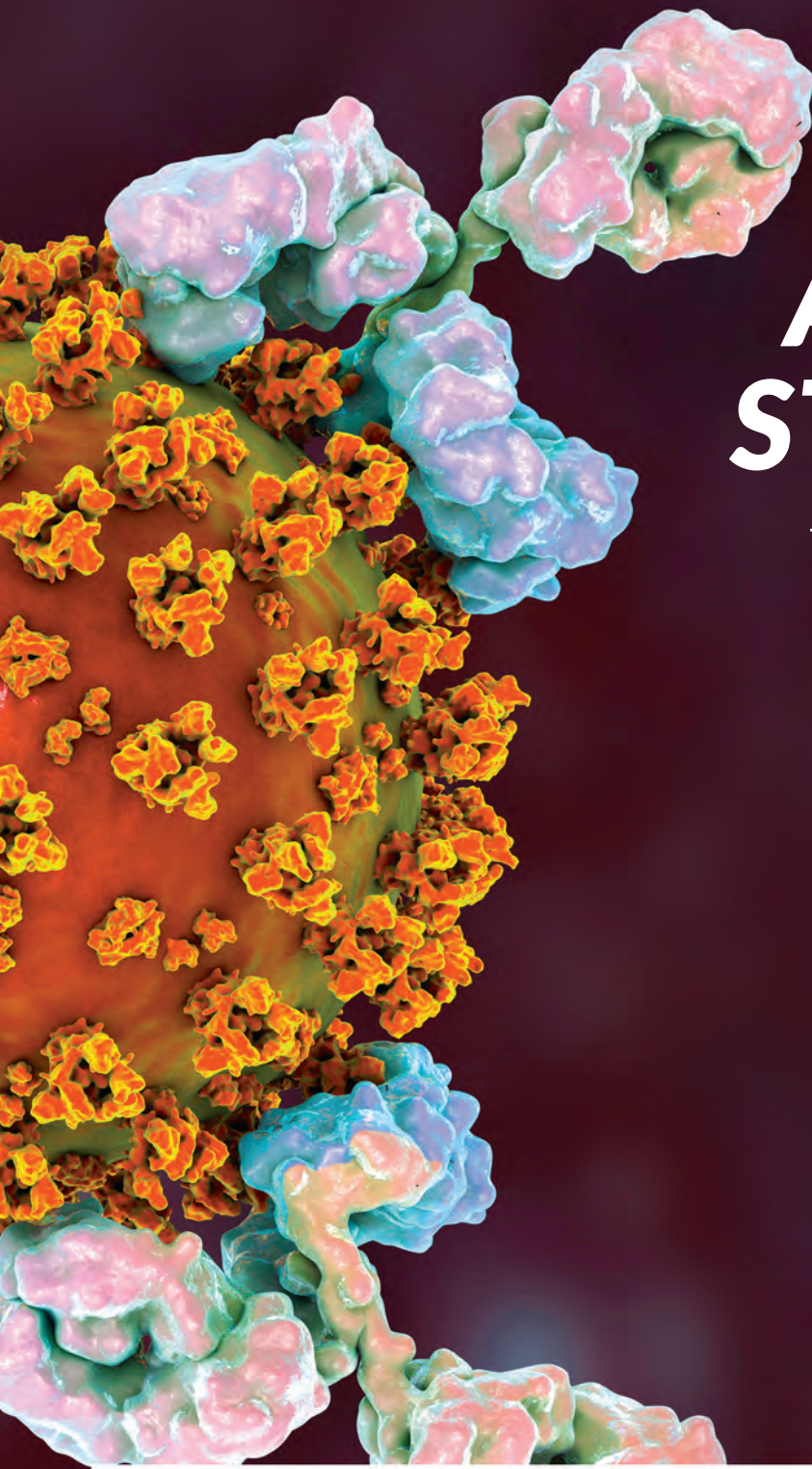


CAYMANCURRENTS



ANTIVIRAL STRATEGIES FOR EMERGING INFECTIOUS DISEASES

IN THIS ISSUE OF THE CAYMAN CURRENTS:

Informative Articles

Resources for Your Research

Virus Life Cycle Infographic

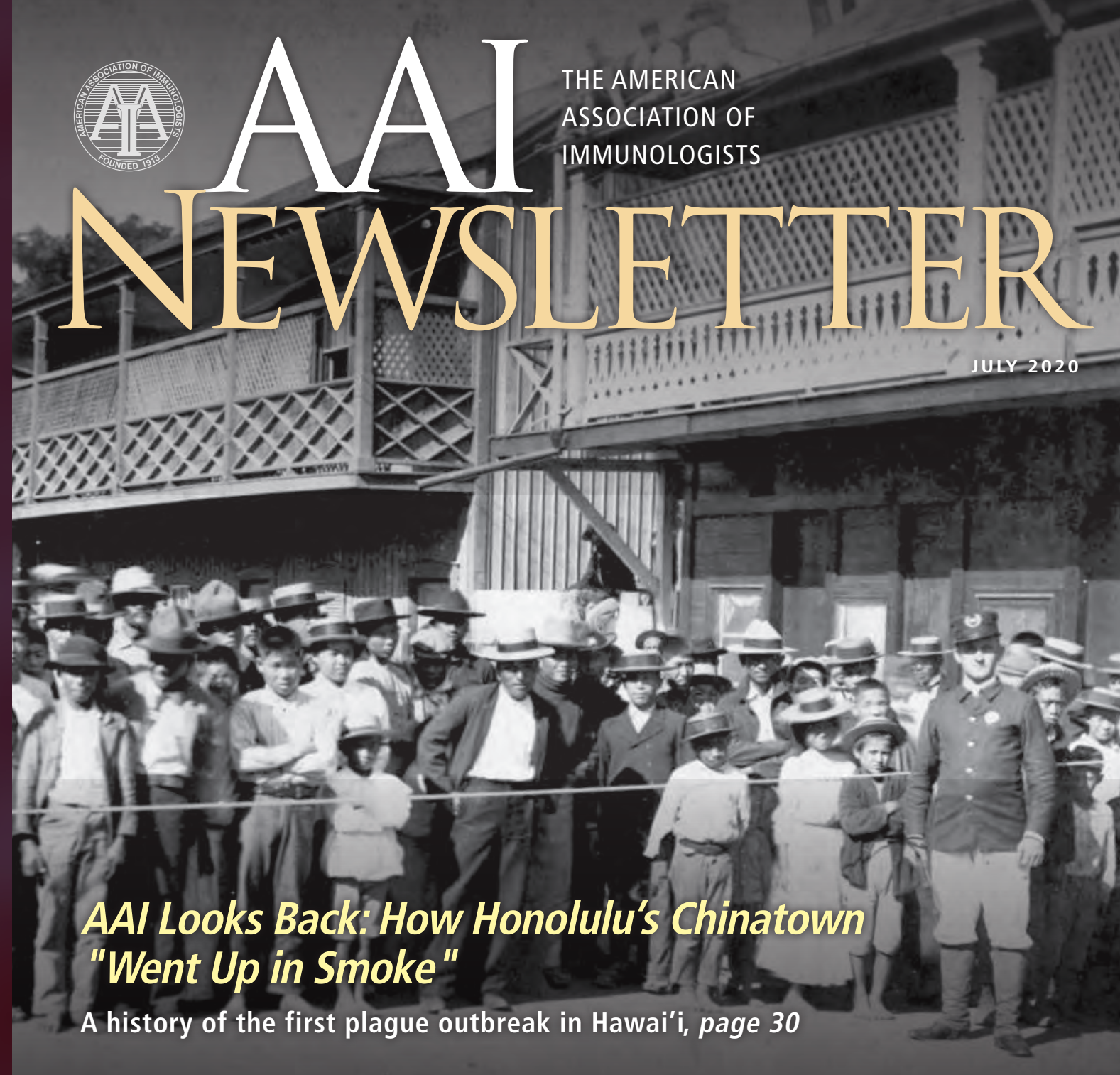
DOWNLOAD THE NEW ISSUE AT WWW.CAYMANCHEM.COM



AAI NEWSLETTER

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS

JULY 2020



AAI Looks Back: How Honolulu's Chinatown "Went Up in Smoke"

A history of the first plague outbreak in Hawai'i, page 30

Non-Profit Org.
U.S. Postage
PAID
Gettysburg, PA
Permit No. 28

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



2020 ADVANCED COURSE IN IMMUNOLOGY

Now Virtual! | July 26–31, 2020

Director: Wayne M. Yokoyama, M.D.

Washington University School of Medicine in St. Louis

Don't miss the premier course in immunology for research scientists!

This intensive course is directed toward advanced trainees and scientists who wish to expand or update their understanding of the field. Leading experts will present recent advances in the biology of the immune system and address its role in health and disease. This is not an introductory course; attendees will need to have a firm understanding of the principles of immunology.

Faculty

Ulrich H. von Andrian, *Harvard Medical School Ragon Institute of MGH, MIT, and Harvard*
Anatomy of the Immune Response

Jonathan C. Kagan, *Children's Hospital Boston Harvard Medical School*
Innate Immunity: Pattern Recognition and Anti-microbial Mechanisms

Kate A. Fitzgerald, *University of Massachusetts Medical School*
Innate Immunity: Gene Regulation

Wayne M. Yokoyama, *Washington University School of Medicine*
NK Cells—Their Receptors and Function in Health and Disease

Gregory F. Sonnenberg, *Weill Cornell Medicine*
Innate Immunity: Cellular Mechanisms

Stephanie Eisenbarth, *Yale School of Medicine*
Dendritic Cells

Eugene M. Oltz, *Ohio State University, Wexner School of Medicine*
The Generation and Modification of Lymphocyte Antigen Receptor Genes

Lisa A. Borghesi, *University of Pittsburgh School of Medicine*
B Cell Development

Avery August, *Cornell University*
T Cell Development

Kai W. Wucherpfennig, *Dana-Farber Cancer Institute, Harvard Medical School*
MHC-restricted Antigen Presentation to T Cells

Carrie L. Lucas, *Yale School of Medicine*
Signaling from Antigen Receptors

David Masopust, *University of Minnesota Center for Immunology*
T Cell Memory

Deepta Bhattacharya, *University of Arizona*
B Cell Memory

Jenny P. Ting, *University of North Carolina, Chapel Hill*
Molecular and Cellular Mediators of Inflammation

Alex K. Shalek, *MIT, Ragon Institute of MGH, MIT, and Harvard, Broad Institute of MIT and Harvard*
Single Cell RNA-seq Analysis

Cathryn Nagler, *University of Chicago*
Effect of the Microbiome on Immunity

Michael S. Diamond, *Washington University School of Medicine*
Immune Response to SARS-CoV-2

Eric Meffre, *Yale University*
B Cell Tolerance and Autoimmunity

Mark S. Anderson, *University of California, San Francisco*
T Cell Tolerance and Autoimmunity

Jonathan Kipnis, *University of Virginia School of Medicine*
Neuroimmunology

Robert D. Schreiber, *Washington University School of Medicine*
Tumor Immunology

Joanne L. Viney, *Pandion Therapeutics*
Immunotherapeutics

Megan A. Cooper, *Washington University School of Medicine*
Redefining Human Immunology

Galit Alter, *Ragon Institute of MGH, MIT, and Harvard*
Vaccines

For complete course details and registration, visit www.aai.org/AdvancedCourse

For assistance, contact (301) 634-7178 or meetings@aai.org.



The American Association of Immunologists

1451 Rockville Pike, Suite 650
Rockville, MD 20852
Tel: 301-634-7178
Fax: 301-634-7887
Email: infoaai@aai.org
www.aai.org

Member Services

Tel: 301-634-7195
Email: members@aai.org

The Journal of Immunology

and

ImmunoHorizons

Tel: 301-634-7197
Email: infoji@aai.org
www.jimmunol.org
www.immunohorizons.org

Council

President

Jenny P. Ting, Ph.D.

Vice President

Gary A. Koretzky, M.D., Ph.D.

Past President

Jeremy M. Boss, Ph.D.

Secretary-Treasurer

Edith M. Lord, Ph.D.

Councillors

Mark M. Davis, Ph.D.
Akiko Iwasaki, Ph.D.
Stephen Jameson, Ph.D.
Ulrich H. von Andrian, M.D.

Ex-Officio Members

David Masopust, Ph.D.
Eugene M. Oltz, Ph.D.
Tania Watts, Ph.D.
M. Michele Hogan, Ph.D.,
AAI Executive Director

To see a list of AAI staff, visit
www.aai.org/staff

© The American Association of Immunologists, Inc.

IN THIS ISSUE

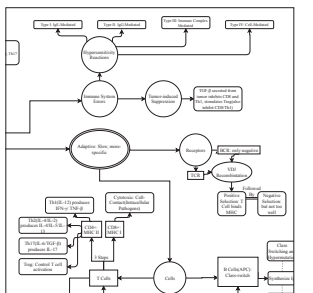
- 4 Executive Office
- 8 Public Affairs
- 20 Members in the News
- 24 Outreach
- 26 Awards
- 28 Education
- 30 History
- 36 Grants and Awards Deadlines
- 38 Meetings and Events



4 Election Results



20 AAI Members Elected to NAS



28 Using Concept Maps in Immunology Education



On the Cover: A member of the National Guard in Honolulu enforces the *cordon sanitaire* in Chinatown, preventing residents from leaving the neighborhood during an outbreak of bubonic plague. Read this story on page 30.

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.

- @ImmunologyAAI
- @J_Immunol (*The Journal of Immunology*)
- @ImmunoHorizons (*ImmunoHorizons*)
- @ImmunologyAAI
- [linkedin.com/company/the-american-association-of-immunologists](https://www.linkedin.com/company/the-american-association-of-immunologists)
- AAINewsletter@aai.org (story ideas and comments about the *AAI Newsletter*)

2020 AAI Election Results

AAI congratulates the following members on their election to the AAI Council and committees. All terms commenced July 1, 2020. AAI extends a sincere thanks to all candidates who agreed to stand for election. Over 22 percent of AAI voting members submitted ballots in the election. We thank them for investing in their profession and in the mission of AAI through their participation.

COUNCIL



President 2020–2021
Jenny P. Ting, Ph.D., AAI '97

William Kenan Professor of Genetics and Microbiology-Immunology
University of North Carolina, Chapel Hill



Vice President 2020–2021
Gary A. Koretzky, M.D., Ph.D., AAI '92

Professor, Weill Cornell Medicine's Department of Medicine
Vice Provost for Academic Integration, Cornell University
Director, Cornell Center for Immunology



Councillor 2020–2024
Ulrich H. von Andrian, M.D., Ph.D., AAI '97

Mallinckrodt Professor of Immunopathology, Harvard Medical School
Member, Ragon Institute of MGH, MIT and Harvard

COMMITTEES

Awards Committee 2020–2023



Jennifer L. Gommerman, Ph.D., AAI '98

Professor, Department of Immunology
University of Toronto

Finance Committee 2020–2023



Bethany B. Moore, Ph.D., AAI '98

Interim Chair and Professor, Department of Microbiology and Immunology; Galen B. Toews M.D. Collegiate Professor of Pulmonary Care and Critical Medicine; Professor, Internal Medicine
University of Michigan Medical School

Nominating Committee 2020–2021



Maria-Luisa Alegre, M.D., Ph.D., AAI '97 – Chair

Professor, Department of Medicine
University of Chicago



Julie Magarian Blander, Ph.D., AAI '09

Gladys and Roland Harriman Professor of Immunology in Medicine; Professor of Medicine
Weill Cornell Medicine

Nominating Committee 2020–2021

(continued)



Shane Crotty, Ph.D., AAI '04

Professor
La Jolla Institute for Immunology



Michael A. Farrar, Ph.D., AAI '00

Professor, Department of Laboratory Medicine and Pathology
University of Minnesota



Yina H. Huang, Ph.D., AAI '04

Associate Professor of Microbiology and Immunology
Geisel School of Medicine at Dartmouth College

Program Committee 2020–2023



Claudia Kemper, Ph.D., AAI '04

Senior Investigator, National Heart, Lung, and Blood Institute
National Institutes of Health



Eric Meffre, Ph.D., AAI '07

Associate Professor with Tenure, Department of Immunobiology
Yale School of Medicine

Publications Committee 2020–2024



Steven M. Varga, Ph.D., AAI '03

Professor, Department of Microbiology and Immunology
University of Iowa

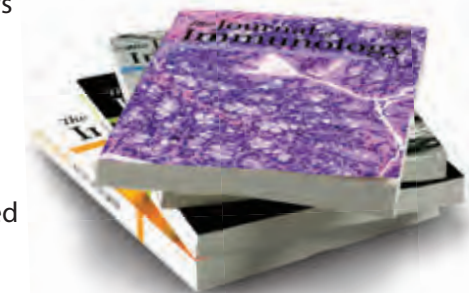
ImmunoCasts

The Journal of Immunology on *your* schedule!

ImmunoCasts feature audio interviews with the Pillars of Immunology commentary writers.

Authors of the Pillars of Immunology commentaries share personal insights into how the featured article(s) impacted their work.

Listen to the interviews during your commute, workout, or while on travel!



Download the mp3 file directly from:
<http://www.jimmunol.org/Immuncasts>

Also available free on **iTunes**.



Statement from the AAI Leadership

On June 5, AAI issued a statement of support and encouragement to members in the wake of recent events that included the coronavirus pandemic, the murder of George Floyd, and the resulting public unrest. We have reprinted the full statement below.



June 5, 2020

Dear AAI Members:

Frightened. Anguished. Saddened. Horrified. Hopeful.

We could use these words to describe our mental state during the past three months as we were experiencing the consequences of the COVID-19 pandemic, or now, after the murder of George Floyd as we witness public outrage to systemic racism.

This year, like none before, has left us reeling from major blows that we have all found difficult to comprehend—and for which finding solutions is even more challenging. Recent events have directed a spotlight onto the racial imbalances, disparities, and inequalities that exist within our communities on a national and personal level.

AAI has endeavored to be a society of inclusion and equality. It is for this reason we created the Minority Affairs Committee in the 1970s to spearhead this endeavor and to ensure we are always held accountable to these values. We were founded on the principle that the advancement of science is not based on race, gender, religion, boundary of nation, or any other difference. Though not always perfect, we will strive to be better and honor that principle at our core—because every single one of you is a valued and appreciated member, and all voices need to be heard. An inclusive organization is a stronger organization.

There are no easy solutions for eliminating the challenges of systemic racism and bias on a national level. Yet organizationally and personally, together we have the power and platform to effect positive change as we continue working to advance

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
EMAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

the goals of inclusive diversity and equitable access within our association and communities.

We hope that you find solace in your science. No matter the focus of your work or the stage of your career, you are part of an amazing community making discoveries for a better world and humankind.

Please know that AAI understands the stress and anxiety our members may be experiencing during these extremely trying times and that we are continuing to work for you.

You are appreciated. You are respected. You matter to us.

Wishing you health, safety, and peace,

Jeremy M. Boss, President
Jenny P. Ting, President-elect
Gary A. Koretzky, Vice President-elect
Robert J. Binder, Chair, Minority Affairs Committee
M. Michele Hogan, Executive Director

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
EMAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG



PUBLIC AFFAIRS

AAI Urges President, Congressional Leaders to Heed Advice of Fauci, Other Scientific Leaders

In mid-April, AAI President Jeremy Boss, Ph.D. (AAI '94), Committee on Public Affairs (CPA) Chair Ross Kedl, Ph.D. (AAI '02), and the members of the AAI Council wrote to President Donald Trump and key Congressional leaders, urging them to heed the advice of scientific and public health experts during the COVID-19 pandemic. The letter, which is reprinted on pages 9 – 11, highlights the indispensable role of National Institute of Allergy and Infectious Diseases (NIAID) Director Anthony Fauci, M.D. (AAI '73), a key member of the White House Coronavirus Task Force, in providing information and advice to both government leaders and the public. It also describes the crucial contributions that immunologists are making around the globe to understand and combat COVID-19.

Congress Approves Fourth Supplemental Funding Bill for COVID-19; Looks Toward Fifth Bill

AAI Advocates for Relief Funding for Science Agencies

The fourth supplemental funding bill to address the devastation caused by the COVID-19 pandemic was enacted in late April. The \$484 billion new law, entitled the Paycheck Protection Program and Health Care Enhancement Act, includes provisions to replenish the major small business loan program created to help businesses pay employees during the pandemic and to provide additional funding for both the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC).

Prior to the passage of this new law, NIH had already received \$1.78 billion in supplemental funding, while CDC had received \$6.5 billion. The overwhelming majority of the NIH funding was appropriated for COVID-19 research, with most of it (\$1.54 billion) directed to NIAID. The latest emergency funding bill provides NIH with \$1.806 billion in COVID-19-related funding, allocated as follows:

- \$1 billion for the NIH Office of the Director “to develop, validate, improve, and implement testing and associated technologies; to accelerate research, development, and implementation of point of care and other rapid testing; and for partnerships with governmental and non-governmental entities.” The NIH Director is also granted transfer authority to provide any of these dollars to NIH institutes and centers.
- \$500 million for the National Institute of Biomedical Imaging and Bioengineering “to accelerate research, development, and implementation of point of care and other rapid testing related to coronavirus.”
- \$306 million for the National Cancer Institute “to develop, validate, improve, and implement serological testing and associated technologies.”

With CDC at the forefront of the domestic public health response, the agency received an additional \$1 billion “for surveillance, epidemiology, laboratory capacity expansion,

contact tracing, public health data surveillance and analytics infrastructure modernization, disseminating information about testing, and workforce support necessary to expand and improve COVID-19 testing.”

Fifth COVID-19 Supplemental Funding Bill Pending

Congress and the White House reportedly intend to pass at least one more major COVID-19 supplemental funding bill this summer, likely focused heavily on economic relief. AAI and others in the scientific community are hopeful that any such bill will include significant relief for federal science agencies and their grantees.

To that end, AAI has supported an effort by Representatives Diana DeGette (D-CO, 1st) and Fred Upton (R-MI, 6th) to include \$26 billion for federal science agencies (~\$10 billion for NIH) in the next COVID-19 economic relief package. Among other things, the funding would be used for pandemic-related research losses, including ramp-up costs for labs forced to slow or stop their research, and to address new career challenges faced by postdoctoral fellows, graduate students, and other trainees. Representatives DeGette and Upton were joined by 180 members of the House in sending a letter to the House leadership in support of the \$26 billion request.

AAI also supported a similar effort in the Senate led by Senators Ed Markey (D-MA) and Thom Tillis (R-NC); their letter garnered the support of 31 additional senators.

Continued on page 12



Representative
Diana DeGette



Representative
Fred Upton

The AMERICAN ASSOCIATION of IMMUNOLOGISTS



President
Jeremy M. Boss, Ph.D.

Vice President
Jenny P. Ting, Ph.D.

Past President
JoAnne L. Flynn, Ph.D.

Secretary-Treasurer
Edith M. Lord, Ph.D.

Councillors
Gary A. Koretzky, M.D., Ph.D.
Mark M. Davis, Ph.D.
Akiko Iwasaki, Ph.D.
Stephen Jameson, Ph.D.

Executive Director
M. Michele Hogan, Ph.D.

April 15, 2020

President Donald J. Trump
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500

The Honorable Mitch McConnell
Majority Leader
United States Senate
S-230, The Capitol
Washington, D.C. 20510

The Honorable Charles E. Schumer
Minority Leader
United States Senate
S-221, The Capitol
Washington, D.C. 20510

Dear Mr. President, Speaker Pelosi, Majority Leader McConnell, Minority Leader McCarthy, and Minority Leader Schumer:

We are the leadership of The American Association of Immunologists (AAI), the nation's largest professional association of research scientists and clinicians who are dedicated to studying the biology of the immune system. Many of our members are pioneers in discovering ways to prevent, treat, and cure infectious diseases, as well as understanding and developing treatments for cancer, autoimmune diseases, and myriad other chronic diseases. Included among these investigators are those deeply immersed in research that may lead to the development of vaccines and treatments for COVID-19. What they are learning will no doubt also help prepare our nation and world for future pandemics.

We thank Congress and the Administration for acting expeditiously to provide the National Institutes of Health, the Centers for Disease Control and Prevention (CDC), and other vital Federal agencies with additional funding to support the scientists and public health officials who are working tirelessly to address the current pandemic. Through constant communication and collaboration, the global immunology research and medical communities are responding to this unprecedented challenge; we are confident that these efforts – with your continued support – will produce the scientific discoveries needed to combat this disease. We are grateful to our clinical members – and all physicians, nurses, and other health personnel – who are bravely and indefatigably

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AALORG * WEB: WWW.AALORG

Letter from The American Association of Immunologists
April 15, 2020
Page 2 of 3

on the front lines, putting professional duty ahead of their personal health concerns.

As we consider all that must still be done, we believe it is imperative that scientists and public health professionals maintain a leading voice in decisions regarding national, state, and local responses to the current crisis. In particular, Dr. Anthony S. Fauci, a valued member of our organization since 1973, has spoken candidly, honestly, and reliably about this pandemic, as he has about many other critically important public health issues since assuming the position of director of the National Institute of Allergy and Infectious Diseases (NIAID) in 1984. Over this time, he has honorably and effectively served six U.S. presidents; as a testament to his service, President George W. Bush awarded him the Presidential Medal of Freedom in 2008. As the world combats this dangerous and deadly infectious disease, Dr. Fauci's strong, nonpartisan voice of experience and leadership has never been more important. We therefore urge our national leaders and the public to continue to heed the advice of, and offer their full support to, Dr. Fauci, his NIAID and CDC colleagues, and other scientific and clinical experts, as we chart the best course forward in defeating the novel coronavirus.

In recent weeks, there have been alarming reports about the political targeting of scientists who are instrumental in leading us through this threat to our lives and liberty. While there are always those willing to exploit a crisis, it is imperative that we do not allow these voices to interfere with, or undermine confidence in, the best scientific, epidemiologic, or public health policy advice or decisions. Now more than ever, it is essential that we allow the science, and those who know it best, to play a leading role in guiding us through these difficult times.

Sincerely,

Jeremy M. Boss, Ph.D., President (Emory Chair in Basic Sciences Research; Professor and Chair, Department of Microbiology & Immunology, Associate Dean for Basic Science Research; Emory University School of Medicine)

Jenny P. Ting, Ph.D., Vice President (William Kenan Professor of Genetics and Microbiology-Immunology, Lineberger Comprehensive Cancer Center, Center for Translational Immunology, University of North Carolina at Chapel Hill School of Medicine)

JoAnne L. Flynn, Ph.D., Past President (Distinguished Professor, Department of Microbiology and Molecular Genetics and the Center for Vaccine Research, University of Pittsburgh School of Medicine)

Edith M. Lord, Ph.D., Secretary-Treasurer (Professor of Microbiology and Immunology and of Oncology, University of Rochester School of Medicine and Dentistry)

Gary A. Koretzky, M.D., Ph.D. (Professor, Weill Cornell Medicine's Department of Medicine; Vice Provost for Academic Integration, Cornell University)

Mark M. Davis, Ph.D. (Investigator, Howard Hughes Medical Institute; Burt and Marion Avery Family Professor, Department of Microbiology and Immunology, Stanford University School of Medicine)

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

Letter from The American Association of Immunologists
April 15, 2020
Page 3 of 3

Akiko Iwasaki, Ph.D. (Investigator, Howard Hughes Medical Institute; Waldemar Von Zedtwitz Professor of Immunobiology and Molecular, Cellular and Developmental Biology; Professor of Molecular Cellular and Developmental Biology; Yale School of Medicine)

Stephen Jameson, Ph.D. (Professor, Department of Laboratory Medicine and Pathology, University of Minnesota-Minneapolis)

Eugene M. Oltz, Ph.D. (Samuel Saslaw Professor of Infectious Diseases, and Chair, Department of Microbial Infection & Immunity, The Ohio State University College of Medicine)

David Masopust, Ph.D. (Professor, Department of Microbiology and Immunology, University of Minnesota Medical School)

Tania Watts, Ph.D. (Professor, Department of Immunology, University of Toronto)

Ross M. Kedl, Ph.D. (Professor of Immunology & Microbiology, University of Colorado Anschutz School of Medicine)

M. Michele Hogan, Ph.D., Executive Director (Maryland)

- cc: The Honorable Mike Pence, Vice President; Chair, White House Coronavirus Task Force
- The Honorable Steven Mnuchin, Secretary of the Treasury
- The Honorable Richard C. Shelby, Chair, Senate Appropriations Committee
- The Honorable Nita Lowey, Chair, House Appropriations Committee
- The Honorable Patrick J. Leahy, Ranking Member, Senate Appropriations Committee
- The Honorable Kay Granger, Ranking Member, House Appropriations Committee
- The Honorable Lamar Alexander, Chair, Senate Health, Education, Labor, and Pensions Committee
- The Honorable Frank Pallone, Jr., Chair, House Energy and Commerce Committee
- The Honorable Patty Murray, Ranking Member Senate Health, Education, Labor, and Pensions Committee; and Ranking Member, Senate Labor, Health and Human Services, Education and Related Agencies Appropriations Subcommittee
- The Honorable Greg Walden, Ranking Member, House Energy and Commerce Committee
- The Honorable Roy Blunt, Chair, Senate Labor, Health and Human Services, Education and Related Agencies Appropriations Subcommittee
- The Honorable Rosa L. DeLauro, Chair, House Labor, Health and Human Services, Education and Related Agencies Appropriations Subcommittee
- The Honorable Tom Cole, Ranking Member, House Labor, Health and Human Services, Education and Related Agencies Appropriations Subcommittee
- Marc Short, Assistant to the President and Chief of Staff to the Vice President
- Joe Grogan, J.D., Assistant to the President for Domestic Policy; and Director, Domestic Policy Council

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

Continued from page 8



Senator Ed Markey

On behalf of AAI, President Boss, CPA Chair Kedl, and Executive Director M. Michele Hogan, Ph.D. (AAI '88), wrote to all four legislators, endorsing their efforts and expressing appreciation for their leadership.

Some progress was made toward the enactment of this fifth bill when the House passed the Health and Economic Recovery Omnibus Emergency Solutions (HEROES) Act on May 15. Although this \$3 trillion bill was approved on a largely party-line vote of 217–189, it outlined House Democrats' priorities for the next funding package.

While the HEROES Act did not provide anywhere near the \$26 billion sought for federal science agencies, it did evince a clear intent to help NIH grantees. In total, the House-

passed bill provided \$4.7 billion to NIH, including \$4.021 billion to the Office of the Director. Of this amount, \$3 billion must be used "for offsetting the costs related to reductions in lab productivity resulting from the coronavirus pandemic or public health measures related to the coronavirus pandemic"; the other \$1.021 billion is directed to research related to COVID-19. The NIH director is given broad authority to transfer this funding to the various institutes and centers. The bill also gives NIH two important new authorities: one

that allows the agency to extend grants set to expire in FY 2020 through FY 2021 if the projects were disrupted due to COVID-19, and another that allows NIH to carry over any unobligated funds into FY 2021.

Despite Senate and White House opposition to many provisions in the House bill, negotiations on this supplemental funding bill have begun.

AAI Submits Testimony to Key Senate Subcommittee

On behalf of AAI, CPA Chair Kedl submitted written congressional testimony to the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies (Labor-HHS Appropriations Subcommittee) on May 21. In the testimony, AAI recommends that Congress provide a \$3 billion funding increase for NIH for FY 2021, for a total funding level of \$44.7 billion. AAI submitted similar testimony to the House Labor-HHS Appropriations Subcommittee in March.

The May submission to the Senate allowed for an updated description of scientific progress and efforts to combat the COVID-19 pandemic, including the Food and Drug Administration's emergency use authorization for remdesivir and the creation of the Accelerating COVID-19 Therapeutic Interventions and Vaccines partnership. The public-private partnership launched by NIH and the Foundation for the NIH will, among other things, work toward advancing COVID-19 vaccine development.

The Senate testimony is reprinted on page 13.



Senator Thom Tillis

AAI Establishes 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.

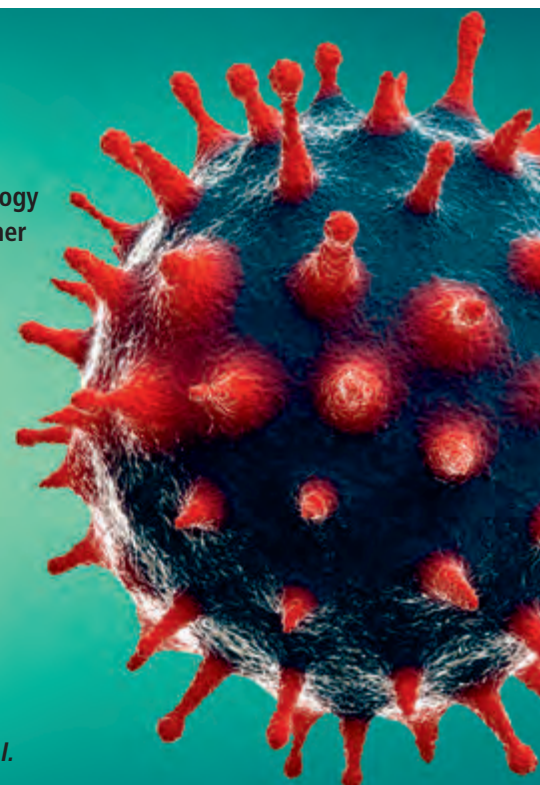
Resources and information that can be found include:

- 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.



Testimony of Ross M. Kedl, Ph.D., on behalf of The American Association of Immunologists (AAI), Submitted to the Senate Appropriations Subcommittee on Labor, Health and Human Services, and Education, and Related Agencies, Regarding the Fiscal Year 2021 Budget for the National Institutes of Health May 21, 2020

The American Association of Immunologists (AAI), the nation's largest professional society of research scientists and physicians who are dedicated to understanding the immune system through basic, translational, and clinical research, respectfully submits this testimony regarding fiscal year (FY) 2021 appropriations for the National Institutes of Health (NIH). *AAI recommends an appropriation of at least \$44.7 billion for FY 2021* to enable NIH to fund critically important research to prevent dangerous infectious diseases and treat debilitating chronic diseases, support meritorious scientists at all career stages, and ensure a robust biomedical research enterprise that maintains U.S. preeminence in science and innovation. Because of the current COVID-19 pandemic, NIH will require, and AAI strongly supports, the appropriation of additional emergency supplemental funding that is being considered outside of the annual appropriations process.

Public Health Importance of Understanding the Immune System

While recent attention to the immune system has focused on its ability, properly harnessed, to kill malignant tumors and treat other chronic diseases (immunotherapy), the coronavirus pandemic has highlighted the immune system's critical role in protecting against infectious agents – including viruses – that cause disease. The immune system plays a significant role in preventing and fighting existing and emerging infectious diseases such as HIV/AIDS, influenza, measles, tuberculosis, and Ebola. It is also central to many chronic conditions such as Alzheimer's and cardiovascular disease. Research into many of these diseases has helped scientists take on our most recent challenge: understanding the cause, prevention, and treatment of a novel coronavirus, SARS-CoV2, and its consequent disease, COVID-19. Significant recent developments in immunology research are described below.

Vaccines for SARS-CoV2/Emerging Infectious Diseases

Vaccines are the most efficient and effective method of disease prevention. Globally, vaccination against more than two dozen viral, bacterial, and fungal diseases prevents about 2.5 million deaths and reduces the severity of illness for millions of people annually.¹ As the world's population grows and becomes more interconnected, the threat of a new emerging pathogen causing a worldwide pandemic, which has long been feared, has been realized: on March 11, 2020, the World Health Organization declared the novel coronavirus outbreak a pandemic.

Although there is currently no approved vaccine for SARS-CoV2, NIH-funded research conducted on other causative pathogens in recent epidemics, including SARS (now known as SARS-CoV1) (2002) and MERS (2012), has made possible the rapid development of vaccine candidates for SARS-CoV2.² While no vaccine is likely to be approved by the Food and Drug Administration (FDA) for at least another year, eight candidate vaccines are currently being tested in human subjects;³ this includes a candidate vaccine developed in part by researchers at the National Institute of Allergy and Infectious Diseases' Vaccine Research Center that moved into a clinical trial at a rate never before observed in the history of vaccine development.⁴ In addition, anti-viral therapeutics supported by NIH-funded research are already in, or are moving toward, clinical testing for efficacy against SARS-CoV2.⁵ One such therapeutic, remdesivir, has already been approved by the FDA for emergency use "for the treatment of suspected or laboratory-

confirmed COVID-19 in adults and children hospitalized with severe disease.”⁶ AAI is optimistic that previously conducted research, together with new research now being urgently pursued, will result in new vaccines and additional treatments that will prevent and/or reduce the lethality of COVID-19.

With regard to other infectious diseases, NIH-funded research has allowed scientists to make significant advances in understanding and developing vaccines against many emerging infectious agents. In 2019 alone, this research helped lead to a FDA-approved Ebola vaccine, a phase-I clinical trial for a Zika vaccine, and a multi-national phase-3 clinical trial for an HIV vaccine.⁷ Researchers have also begun early-stage clinical trials of a universal vaccine for influenza, a disease that results in 9 – 45 million illnesses and 12,000 – 61,000 deaths per year in the U.S.⁸ Without strong, steady support from NIH, researchers will be ill-prepared to respond to new emerging diseases threatening the safety of Americans and people around the world.

Cancer Immunotherapy

Cancer immunotherapy harnesses the power of the immune system of the patient to fight tumors, contributing to substantial reductions in cancer mortality. These treatments include engineered tumor-specific immune cells (adoptive cell therapy), therapies that restore cellular functional capacity to exhausted immune cells (checkpoint blockade), and vaccines to generate new immune responses against the tumor. In 2019, the FDA approved immunotherapies for several types of cancer, including breast, bladder, uterine, kidney, and esophageal.⁹

- Adoptive cell therapy: The success of chimeric antigen receptor T cells (CAR-T; T cells engineered to express novel receptors targeting specific tumor-associated molecules) in the treatment of B cell lymphomas has led to current NIH-funded clinical trials testing the efficacy of CAR-T cells in solid tumors, such as for patients with glioblastoma and pancreatic cancer.¹⁰
- Checkpoint blockade therapy: Recent advances in this area have provided substantial benefit in clinical trials to oncology patients with solid tumors, including melanoma, non-small-cell lung carcinoma, and glioblastoma.¹¹ Additional research efforts aim to increase the efficacy of this treatment by identifying combinatorial therapies and biomarkers of successful treatment.¹²
- Vaccines: An existing therapeutic vaccine targets prostate cancer, with ongoing clinical trials testing novel vaccines designed to combat multiple myeloma and breast cancer.¹³ Additionally, meta-analyses of a decade of human papilloma virus (HPV) vaccinations have provided compelling evidence of the vaccine’s efficacy and safety, leading to new efforts to reduce HPV-related cervical cancer.¹⁴

Ongoing NIH-funded research seeks to identify new opportunities to improve the efficacy of immunotherapies for additional cancer types as well as exploring its use as a treatment for other life-threatening or debilitating conditions, including heart disease and autoimmune conditions.¹⁵

Vaping

Since 2007, the U.S. has seen an exponential increase in the use of e-cigarettes. In 2018, one in 20 middle school and one in five high school students was using e-cigarettes.¹⁶ This increased use has resulted in an outbreak of e-cigarette or vaping associated lung injuries (EVALI), with nearly 3,000 cases of hospitalization or death.¹⁷ Pathological analyses of lung injury patterns demonstrate extensive lung inflammation in these cases.¹⁸ While inflammation – the immune system’s response to injury – is usually a sign of healing, excessive inflammation for a prolonged period of time will cause lung damage that can be fatal. As a result, NIH is currently supporting research to investigate the pathogenesis of EVALI, including studies of especially vulnerable populations, such as those with allergies or asthma.¹⁹

NIH’s Essential Role in the Nation’s—and the World’s—Biomedical Research Enterprise

As the nation’s major funding agency for biomedical research, NIH supports more than 300,000 researchers at ~2,500 universities, medical schools, and other research institutions across the nation and internationally,²⁰ as well as ~6,000 additional researchers and clinicians who work at NIH facilities around the country.²¹ By supporting these researchers and laboratories, NIH funding strengthens state and local economies; in 2019, NIH funding supported more than 476,000 jobs and accounted for \$81 billion in economic activity across the U.S.²² NIH-funded basic research is also an essential and irreplaceable part of the biomedical research pipeline, leading to lifesaving and life-changing new drugs. In 2018, NIH-funded research contributed to all 210 of the new drugs approved by the FDA from 2010-2016.²³

NIH also serves as an indispensable scientific leader both in the U.S. and internationally. The steward of nearly \$42 billion in federal funds, NIH keeps our nation’s leaders apprised of scientific advancements and research priorities and works to ensure that taxpayer dollars are prudently spent. It oversees and establishes rules governing the conduct of scientific research and the research enterprise, working most recently to combat sexual harassment in science and address concerns about foreign influence in science.

NIH also plays an essential role in responding to emerging threats; during the current novel coronavirus pandemic, NIH is providing vital scientific expertise to the President, Congress, and the American public while supporting urgently needed efforts to develop treatments and a vaccine. In April, working in collaboration with the Foundation for the NIH (FNIH), NIH announced the formation of the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) partnership. This effort will bring together leading biopharmaceutical and biotech companies and government agencies “to develop an international strategy for a coordinated research response to the COVID-19 pandemic,” including developing “a collaborative framework for prioritizing vaccine and drug candidates, streamlining clinical trials, coordinating regulatory processes and/or leveraging assets among all partners to rapidly respond to the COVID-19 and future pandemics.”²⁴

Funding Increases Continue to Rebuild NIH Capacity

Congress, led by this subcommittee, has invested robustly in NIH in recent years, including a \$2.6 billion budget increase for FY 2020. This increase has helped restore much of the purchasing power that NIH lost after years of inadequate budgets and erosion from biomedical research inflation; once more than 22% below its peak funding level (2003), the gap has eased to ~5.4%.²⁵ Meaningful budget growth remains necessary to close this gap and allow NIH to make needed investments in important research priorities across all NIH Institutes and Centers. Because the current cap on FY 2021 nondefense discretionary spending could preclude the subcommittee from making this investment, AAI requests a budget cap exemption for NIH.

As the baby boom generation continues to retire, it is even more urgent to ensure a dynamic research environment that will allow for the training, development, and support of our next generation of researchers, doctors, professors, and inventors. Timely, robust funding increases for NIH would instill further confidence in all researchers, including these essential early- and mid-career researchers.

Conclusion

AAI greatly appreciates the subcommittee’s strong support for NIH and urges an appropriation of at least

\$44.7 billion for FY 2021. This funding level will provide needed growth across NIH, including for vital immunologic research, support meritorious scientists at all career stages, and help scientists discover ways to prevent, treat, and cure diseases that afflict people in the U.S. and around the world.

¹ https://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en/
² <https://www.niaid.nih.gov/diseases-conditions/coronaviruses>
³ <https://www.who.int/who-documents-detail/draft-landscape-of-covid-19-candidate-vaccines;>
<https://www.washingtonpost.com/health/2020/05/18/coronavirus-vaccine-first-results/>
⁴ <https://www.nih.gov/news-events/news-releases/nih-clinical-trial-investigational-vaccine-covid-19-begins>
⁵ <https://www.nih.gov/news-events/news-releases/nih-clinical-trial-remdesivir-treat-covid-19-begins>
⁶ <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-issues-emergency-use-authorization-potential-covid-19-treatment>
⁷ [https://directorsblog.nih.gov/2020/01/02/celebrating-biomedical-breakthroughs-in-2019/;](https://directorsblog.nih.gov/2020/01/02/celebrating-biomedical-breakthroughs-in-2019/)
<https://www.nih.gov/news-events/news-releases/nih-begins-clinical-trial-live-attenuated-zika-vaccine;>
<https://www.nih.gov/news-events/news-releases/nih-partners-launch-hiv-vaccine-efficacy-trial-americas-europe>
⁸ [https://www.cdc.gov/flu/about/burden/index.html;](https://www.cdc.gov/flu/about/burden/index.html) <https://www.nih.gov/news-events/news-releases/nih-begins-first-human-trial-universal-influenza-vaccine-candidate>
⁹ <https://www.cancerresearch.org/immunotherapy/timeline-of-progress#>
¹⁰ <https://clinicaltrials.gov/> (NCT04003649, NCT02830724)
¹¹ <https://www.ncbi.nlm.nih.gov/pubmed/30742122;>
<https://www.ncbi.nlm.nih.gov/pubmed/30407895>
¹² <https://www.ncbi.nlm.nih.gov/pubmed/31636208;>
<https://www.ncbi.nlm.nih.gov/pubmed/30318169>
¹³ <https://www.cancer.gov/about-cancer/treatment/types/immunotherapy/cancer-treatment-vaccines;>
<https://clinicaltrials.gov/> (NCT03376477, NCT00971737)
¹⁴ <https://www.ncbi.nlm.nih.gov/pubmed/31255301;>
<https://www.ncbi.nlm.nih.gov/pubmed/31990905>
¹⁵ <https://www.ncbi.nlm.nih.gov/pubmed/31511695;>
<https://www.ncbi.nlm.nih.gov/pubmed/31957209>
¹⁶ https://www.cdc.gov/tobacco/basic_information/e-cigarettes/surgeon-general-advisory/index.html
¹⁷ https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html
¹⁸ [https://www.hindawi.com/journals/cripu/2020/6138083/;](https://www.hindawi.com/journals/cripu/2020/6138083/)
<https://pubs.rsna.org/doi/10.1148/radiol.2020192585>
¹⁹ <https://www.niaid.nih.gov/grants-contracts/vaping-and-lung-injury>
²⁰ [https://www.nih.gov/about-nih/what-we-do/budget;](https://www.nih.gov/about-nih/what-we-do/budget) <https://report.nih.gov/award/index.cfm>
²¹ <https://irp.nih.gov/about-us/research-campus-locations>
²² <https://www.unitedformedicalresearch.org/wp-content/uploads/2019/04/NIHs-Role-in-Sustaining-the-US-Economy-FY19-FINAL-2.13.2020.pdf>
²³ <https://directorsblog.nih.gov/2018/02/27/basic-research-building-a-firm-foundation-for-biomedicine/>
²⁴ [https://www.nih.gov/news-events/news-releases/nih-launch-public-private-partnership-speed-covid-19-vaccine-treatment-options;](https://www.nih.gov/news-events/news-releases/nih-launch-public-private-partnership-speed-covid-19-vaccine-treatment-options) Corey *et al.* A Strategic Approach to COVID-19 Vaccine R&D. *Science*. DOI: 10.1126/science.abc5312 (2020)
²⁵ <https://crsreports.congress.gov/product/pdf/R/R43341>

AAI Announces 10th Class of Public Policy Fellows

The 10th year of the AAI Public Policy Fellows Program (PPFP) began on May 1, 2020. The PPFP engages up to 10 early-career scientists in AAI public policy and legislative activities that impact immunology and biomedical research. The program culminates in a visit to Washington, D.C., to advocate on Capitol Hill for increased robust funding for NIH and to describe recent advances in immunological research. This year's class will be talking extensively about, and assisting with, AAI advocacy efforts related to COVID-19.

AAI is pleased to welcome the following 10 new Fellows:



S. Elizabeth Franks, Ph.D. (AAI '19)
 Postdoctoral Fellow
 National Cancer Institute, NIH



Joshua T. Mattila, Ph.D. (AAI '12)
 Assistant Professor
 University of Pittsburgh School of Medicine



Erin M. Harberts, Ph.D. (AAI '17)
 Postdoctoral Fellow
 University of Maryland, Baltimore



Parameswaran Ramakrishnan, Ph.D. (AAI '15)
 Assistant Professor
 Case Western Reserve University



April Huseby Kelcher, Ph.D. (AAI '15)
 Postdoctoral Research Fellow
 University of Minnesota, Twin Cities



Julia M. Scordo, Ph.D. (AAI '20)
 Postdoctoral Fellow
 Texas Biomedical Research Institute/University of Texas Health Science Center at San Antonio



Peter D. Krueger, Ph.D. (AAI '13)
 Postdoctoral Fellow
 University of Minnesota Center for Immunology



Shipra Vaishnava, Ph.D. (AAI '18)
 Assistant Professor
 Brown University



Brina Lopez, D.V.M., Ph.D. (AAI '20)
 Assistant Professor
 Midwestern University



Tayab Waseem, Ph.D. (AAI '17)
 Medical Student
 Eastern Virginia Medical School

AAI Seeks Explanation for Abrupt NIH Termination of EcoHealth Alliance Grant

AAI recently wrote to NIH Director Francis Collins, M.D., Ph.D., expressing concern about NIH's decision to revoke grant funding for an ongoing project entitled "Understanding the Risk of Bat Coronavirus Emergence." In their letter, President Boss, CPA Chair Kedl, and Executive Director Hogan requested an explanation as to "why the grant—which appears to fund research of great relevance to the COVID-19 pandemic—was abruptly terminated."

According to *NPR*, NIH told the project sponsor, EcoHealth Alliance, that, "at this time NIH does not believe the current project outcomes align with the program goals and agency priorities." The AAI leaders explained that further clarification by NIH "could reinforce confidence in the NIH grant review system at a time when many are concerned that world and national events may be politicizing the science we need the most."


As of press time, AAI had not yet received a reply from Dr. Collins.

AAI Issues Statement Opposing U.S. Withdrawal from WHO, Visa Changes Affecting Some Chinese Scientists/Students

On behalf of AAI, CPA Chair Kedl recently issued a statement opposing two actions taken by President Donald Trump: withdrawing the United States from the World Health Organization (WHO) and issuing a Proclamation that disallows visas for certain Chinese students and researchers.

According to Kedl, "[t]aken together, the President's actions will seriously harm the ability of U.S. and international scientists and public health leaders to work collaboratively to combat this pandemic and advance other important scientific research."

Kedl's full statement is reprinted on page 19.



GRIP
Grant Review for Immunologists Program

Get a GRIP: An AAI program designed to help new investigators prepare their NIH grant proposals

The AAI Grant Review for Immunologists Program (GRIP) offers new principal investigators (PIs) access to established PIs for guidance in preparing grant proposals as they embark on their independent careers. Early-career PIs (assistant professors or equivalents) are invited to submit their grants' "Specific Aims" pages to the GRIP coordinator who, with the assistance of a small volunteer subcommittee, will attempt to match each topic of the proposal with the research experience of an established PI. Matches will be made as quickly as possible to allow participants to meet upcoming NIH grant deadlines. Participation is open only to AAI regular members and is strictly voluntary. The program is not intended to supplant internal mentoring programs at applicants' institutions.

To apply, please send your CV and the grant's "Specific Aims" page to infoaai@aai.org. (please write "GRIP" in the subject line)

To volunteer as a mentor, please send your CV and a brief description of your grant-reviewing experience to infoaai@aai.org. (subject line "GRIP")

 **Program details at aai.org/Education/GRIP**



THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS

**Statement of AAI Committee on Public Affairs Chair Ross M. Kedl, Ph.D.
June 9, 2020**

AAI Opposes U.S. Withdrawal from WHO and Visa Changes Affecting Some Chinese Scientists/Students

The American Association of Immunologists (AAI) strongly opposes two recent actions by President Donald Trump that will impede scientific advancement and harm public health: the withdrawal of the United States from the World Health Organization (WHO), and the May 29, 2020, "Proclamation" (<https://bit.ly/2BDizg8>) disallowing visas for certain Chinese students and researchers.

As the nation's largest professional association of research scientists and physicians who study the immune system, AAI represents many scientists who are on the front lines of the fight against COVID-19. Whether researching immune system reaction to the virus (SARS-CoV-2) or developing treatments or vaccines, these scientists depend on transparent communication and robust collaboration with colleagues from around the world.

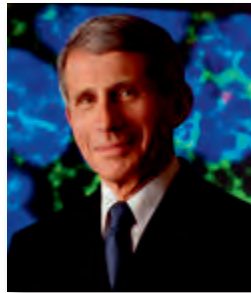
- Withdrawing the U.S. from the WHO, particularly in the midst of an international pandemic, is wholly counterproductive and undermines WHO's purpose, influence, and abilities. As the "directing and coordinating authority on international health within the United Nations system," the WHO, which the U.S. co-founded and has supported since 1948, prevents, detects, and responds to health emergencies around the globe. While the time will come to explore whether the WHO did all it could, as best it could, in the months leading up to the pandemic, it is wrong and dangerous for the U.S. to withdraw its support at a time when the international scientific and public health communities urgently need closer collaboration.
- While sharing concerns about threats posed by foreign countries to U.S. national security and intellectual property, AAI opposes the President's Proclamation, which constitutes an overly broad attack on our scientific colleagues from China. Pursuant to this Proclamation, many Chinese students and researchers who contribute importantly to the U.S. scientific enterprise may be denied entry into, or required to leave, the U.S. for specious reasons over which they have no control. Further, the Proclamation undermines efforts by many federal science agencies, higher education institutions, scientific associations, and businesses to ensure that the U.S. remains an open, welcoming nation that will attract the most talented scientists and students from around the world. Although AAI supports efforts to address threats to U.S. research or innovation, we oppose any legislation or policy which could unfairly impact innocent Chinese students or scientists. Instead, we encourage American universities and institutions to continue working with appropriate federal authorities to identify and stop those who engage in illegal activity that jeopardizes national security or damages the U.S. scientific enterprise.

Taken together, the President's actions will seriously harm the ability of U.S. and international scientists and public health leaders to work collaboratively to combat this pandemic and advance other important scientific research. Now more than ever, we need to work with our international colleagues – both here at home and abroad – to better understand and vanquish this deadly viral enemy and the many other public health threats that will undoubtedly emerge.

1451 ROCKVILLE PIKE, SUITE 650, ROCKVILLE, MARYLAND 20852
PHONE: 301-634-7178 * FAX: 301-634-7887
EMAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

Fauci Receives FASEB Public Service Award

Anthony S. Fauci, M.D. (AAI '73), has been selected to receive the Federation of American Societies for Experimental Biology Public Service Award for his decades of outstanding leadership in basic and applied research to prevent, diagnose, and treat daunting infectious diseases.



Dr. Fauci is the director of the National Institute of Allergy and Infectious Diseases (NIAID) at the National Institutes of Health (NIH), where he has served as chief of NIAID's Laboratory of Immunoregulation since 1980. 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.

Most recently, as a member of the federal 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 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.

Fauci was named to the inaugural class of Distinguished Fellows of AAI in 2019, which 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, the highest honor 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. He 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.

Green, Jenkins, June, Lieberman, Merad Elected to National Academy of Sciences

AAI members Douglas R. Green, Ph.D. (AAI '84), former AAI president Marc K. Jenkins, Ph.D. (AAI '88), Carl H. June, M.D. (AAI '87), Judy Lieberman, M.D., Ph.D. (AAI '19), and Miriam Merad, M.D., Ph.D. (AAI '19), have been elected to the National Academy of Sciences in recognition of their distinguished and continuing achievements in original research.



Dr. Green is a member and chair of the Department of Immunology at St. Jude Children's Research Hospital. His research focuses on the process of active cell death and cell survival, extending from the role of cell death in the regulation of cancer and immune responses in the whole organism to the fundamental molecular events

directing the death of the cell. More recently, he discovered the process of LC3-associated phagocytosis, which links the autophagy pathway to phagosome maturation. Other areas of intense interest include regulated necrosis and metabolic reprogramming during asymmetric division in T lymphocytes.

Green is a past member of the AAI Education Committee and has served as a major symposium chair and speaker at AAI annual meetings.



Dr. Jenkins is a Regents Professor in the Department of Microbiology and Immunology and the Center for Immunology at the University of Minnesota Medical School. His laboratory is dedicated to unraveling the cellular and molecular interactions that dictate the function of helper T cells in the body. To tease apart the

components of T cell responses, Jenkins and his lab colleagues have developed several elegant techniques to directly track antigen-specific cells in the mouse. These methods have allowed the group to visualize and identify the roles of various antigen-presenting cells, costimulatory receptors, and lymphokines during the early phases of the helper T cell response. This research seeks a basic understanding of T cell development, activation, and memory in the mouse that can be applied to similar studies in humans with the goal of improving vaccines and preventing T cell responses that cause autoimmune disease and graft rejection.

Jenkins served as the 2013–2014 AAI president and as a member of the AAI Council from 2008 to 2015. He was selected as the 2020 AAI Lifetime Achievement Award honoree and as a 2019 Distinguished Fellow of AAI. He received the AAI Excellence in Mentoring Award in 2018 and was the 2002 recipient of the AAI-Huang Foundation Meritorious Career Award (known today as the AAI-Thermo Fisher Meritorious Career Award).

Prior to his service on the AAI Council, Jenkins served as a member of the AAI Program, Education, and Nominating committees (including as chair of the latter). He has also served as an associate editor for *The JI*, director and faculty member for the AAI Advanced Course in Immunology, and faculty member for the AAI Introductory Course in Immunology. He is a past AAI Distinguished Lecturer and major symposium chair and speaker at AAI annual meetings and has served as an AAI delegate to the International Union of Immunological Societies (IUIS) General Assembly.



Dr. June is Richard W. Vague Professor in Immunotherapy and director of the Center for Cellular Immunotherapies at the Perelman School of Medicine, University of Pennsylvania. His research on the use of adoptive immunotherapy for cancer and HIV infection has demonstrated that the CD28 signaling pathway can induce T

cell activation and proliferation independently of T cell receptor (TCR) signaling. His current studies use unique cell culture systems to generate chimeric antigen receptor (CAR) T cells to treat HIV and malignancies such as chronic lymphocytic leukemia, B cell acute lymphoblastic leukemia,

and solid pancreatic and brain tumors. He is among the pioneering developers of CAR T cell therapy, which received FDA approval in 2017.

June was selected to the 2020 class of Distinguished Fellows of AAI. He was the 2014 recipient of the AAI Steinman Award for Human Immunology Research and is a past associate editor for *The JI*. He has also served as a major symposium chair and speaker at AAI annual meetings and as a faculty member for the AAI Introductory Course in Immunology.



Dr. Lieberman is an endowed chair of cellular and molecular medicine at Boston Children's Hospital and a professor in the Department of Pediatrics at Harvard Medical School. Her lab studies cytotoxic lymphocytes (CTLs), key cells in the immune defense against viral infections and cancer. Studies by her group showed that although

individuals infected with HIV have large populations of HIV-specific CTLs, their function is significantly compromised in vivo. Her interest in HIV led to more recent work to harness RNA interference (RNAi) to suppress HIV infection. Her lab demonstrated that RNAi could be used to protect animals from disease—observations that her group is currently working to translate for therapeutic use for HIV and cancer. More recently, she and her colleagues have been studying how micro RNAs regulate cell differentiation and cancer.

Lieberman has served as a major symposium chair and speaker at AAI annual meetings.



Dr. Merad is a professor of immunology, medicine, and oncological science at Icahn School of Medicine at Mount Sinai, where she also serves as co-leader of the cancer immunology program and director of the Immunology Institute. She is also Vice President of the IUIS. Her laboratory studies the

mechanisms that regulate the development and function of the mononuclear phagocyte lineage, including dendritic cells and macrophages. Merad and her lab colleagues have made seminal discoveries in macrophage biology, revealing their embryonic origin and their local maintenance in situ. The group identified many of the mechanisms that control dendritic cell and macrophage development; homeostasis; and function in different tissues, including the contribution of mononuclear phagocytes to neuronal function, barrier tissue integrity, and tumor response to immunotherapy. Currently, one of the major goals of the Merad laboratory is to identify the contribution of phagocytes to tumor progression and response to treatment in mice and humans.

Merad has served as an ad hoc reviewer for *The JI*.

Sakaguchi Receives 2020 Ehrlich Darmstaedter Prize

Shimon Sakaguchi, M.D., Ph.D. (AAI '90), is the recipient of the 2020 Paul Ehrlich and Ludwig Darmstaedter Prize in honor of his pioneering discoveries of regulatory T cells (T_{regs}) and their instrumental role in self-tolerance, which unleashed great potential for the development of new medical treatments.



Dr. Sakaguchi is a professor in the Department of Experimental Immunology and the Immunology Frontier Research Center at Osaka University in Japan. Research in the Sakaguchi lab demonstrated that the surface protein CD25 is a reliable marker for naturally occurring T_{regs} and that dysfunction or deficiency in this

population can result in autoimmune disease, allergy, and inflammatory bowel disease. The group also demonstrated that Foxp3 is the central transcriptional regulator for T_{regs}. Current studies focus on how T_{regs} are produced in the normal immune system and how they can be exploited to treat autoimmune disease.

Sakaguchi has served as an associate editor and ad hoc reviewer for *The JI* and as a major symposium speaker at AAI annual meetings.

Leonard Named 2020 Milstein Award Recipient

Warren J. Leonard, M.D. (AAI '86), has been selected to receive the 2020 Seymour and Vivian Milstein Award for Excellence in Interferon and Cytokine Research presented by the International Cytokine and Interferon Society. The award recognizes his groundbreaking scientific contributions in both the basic biology of cytokine signaling (particularly IL-2 and related cytokines) and translational aspects, including pioneering work in the area of X-linked severe combined immunodeficiency and exploration of the role of cytokines in immune dysregulation.



Dr. Leonard is an NIH Distinguished Investigator at the National Heart, Lung, and Blood Institute, NIH, where he serves as chief of the Laboratory of Molecular Immunology and director of the Immunology Center. His research focuses on understanding the biology, molecular mechanisms, and regulation of cytokines,

particularly interleukins, that signal through the common gamma chain. His early groundbreaking studies involved cloning the human IL-2 receptor (IL-2R), facilitating the discovery that the IL-2R gamma chain, or common gamma chain, is shared amongst several cytokines. Leonard's lab

was the first to clone the IL-21 receptor and has since shown its importance in several disease models, including cancer and autoimmune diseases such as lupus, uveitis, and type 1 diabetes.

The group's research has also advanced the understanding of primary immunodeficiencies, demonstrating that underlying IL-2R gamma mutations are related to X-linked severe combined immunodeficiency and that other immunodeficiencies are caused by gene mutations in Janus-activated kinase 3 and IL-7 receptor. Current studies focus on the complex interplay between cytokines and immune cells during normal and pathogenic immune responses and also on advanced large-scale analyses—such as next-generation sequencing—to investigate sources of unidentified immunodeficiencies.

Leonard was the 2003 recipient of the AAI-Huang Foundation Meritorious Career Award. He has served as a major symposium chair at the AAI annual meeting, and as an associate editor for *The JI*.

Gaffen and Kuchroo Selected as ICIS-BioLegend William E. Paul Award Recipients

Sarah L. Gaffen, Ph.D. (AAI '00), and **Vijay K. Kuchroo, D.V.M., Ph.D. (AAI '86)**, have been named by the International Cytokine and Interferon Society (ICIS) as co-recipients of the 2020 ICIS-BioLegend William E. Paul Award, in recognition of their combined contributions deciphering the role of a key cytokine, IL-17, in health and disease.



Dr. Gaffen is the Gerald P. Rodnan Professor of Rheumatology in the Department of Medicine, Division of Rheumatology and Clinical Immunology, at the University of Pittsburgh School of Medicine, where she serves as director of basic rheumatology research. Gaffen is a leader in the field of IL-17 biology and function. Her

laboratory demonstrated a role for Th17 cells in fighting yeast infections and described the IL-17 signature that is now widely used in the field as a measure of IL-17 activity. More recently, Gaffen has produced seminal studies on oral mucosa immunity, including the observation that mucosal epithelial cells are responsive to IL-17 and that IL-17 is host-protective in the oral mucosa in a model of anaerobic periodontal bacterial infection. Additionally, Gaffen's group showed that IL-17 is critical for immunity to the opportunistic fungal infection *Candida albicans*.

Gaffen currently serves as a deputy editor for *The JI* and previously held appointments as associate and deputy editor. She is a past member of the AAI Committee on the Status of Women (CSOW) and has served at AAI annual meetings as a major symposium chair and speaker, abstract programming chair, and CSOW table leader.



Dr. Kuchroo is the Samuel L. Wasserstrom Professor of Neurology at Harvard Medical School (HMS) and director of the Evergrande Center for Immunologic Diseases at HMS and Brigham and Women's Hospital. His work has been fundamental in defining IL-17-producing Th17 cells, their role in autoimmunity, and how their modulation impacts immune function and tissue inflammation. His research contributed

to the development of immunotherapeutics that target both T cell immunoglobulin mucin-3 in cancer and IL-17 for autoimmune diseases, such as multiple sclerosis. Additionally, Kuchroo has made important contributions to the field of innate lymphoid cells by defining pathways for differentiation of Th17, Tr1, and Th9 cells.

Kuchroo was a 2012 AAI Distinguished Lecturer and has served as a major symposium chair and speaker, as well as abstract programming chair, at AAI annual meetings. He has also served as an associate and section editor for *The JI* and as a faculty member for the AAI Introductory and Advanced Immunology Courses.

Fitzgerald Elected to Royal Irish Academy; Named a Harrington Scholar

Kate A. Fitzgerald, Ph.D. (AAI '06), has been admitted to the Royal Irish Academy, the highest academic distinction in Ireland, as an honorary member, in recognition of her achievements in scientific research and scholarship. Honorary membership in the academy is reserved for academics residing outside of Ireland who have made major international contributions to their disciplines.



She is also one of 12 scientists recently selected from among hundreds of U.S., Canadian, and U.K. applicants to receive Harrington Scholar Awards from the Harrington Discovery Institute and Morgan Stanley Global Impact Funding Trust Cures. The COVID-19 rapid response initiative awards provide recipients with grant funding and expert drug development support to advance novel therapies, next-generation vaccines, and vaccine alternatives to fight COVID-19 and avert future pandemics. Fitzgerald is pursuing fumarate-based therapeutics and a clinical trial for lung injury through her grant award.

Dr. Fitzgerald is the Worcester Foundation for Biomedical Research Chair at The University of Massachusetts Medical School, where she also serves as a professor of medicine, vice chair for research in the Department of Medicine, and director of the Program in Innate Immunity. Her research focuses on understanding the molecular mechanisms controlling the inflammatory response. She and her lab colleagues have made seminal discoveries in the areas of host-pathogen interactions; innate immunity; and mechanisms of inflammation, including discoveries of new receptors for pathogens, new signaling molecules, and defining how innate immune pathways contribute to autoimmune and inflammatory disease.

Fitzgerald was the 2014 recipient of the AAI-BD Biosciences Investigator Award. She serves as an abstract programming chair for the AAI annual meetings, at which she has also participated as a major symposium chair and speaker. She has twice served as elected chair of the AAI Nominating Committee, is a past associate editor and section editor for *The JI*, and has served as a faculty member for the AAI Advanced Courses in Immunology.

You, too, can be a Member in the News

AAI welcomes the opportunity to promote the career achievements and professional honors attained by AAI member scientists. This not only serves to inspire scientists at every career stage but also informs the readership of the *AAI Newsletter* of immunology's vital and widening role in scientific discovery and transformative medicine.

If you know of an AAI colleague who has received noteworthy scientific or service recognition, please let us know by emailing AAINewsletter@aai.org.

When emailing, please provide a link to the website of the honoring institution along with any additional information.

Thank you!

AAI Outreach Program Update

The AAI Outreach Program provides career development opportunities for young investigators by supporting podium and poster presentation awards at member-organized immunology meetings throughout the United States. The program most recently provided sponsorship at the meetings highlighted in this section.

Midwinter Conference of Immunologists (MCI)

The 59th MCI took place from January 25 – 28, 2020, at Asilomar Conference Grounds in Pacific Grove, California. The meeting drew 283 attendees and saw a dramatic increase in poster abstract submissions this year.

The meeting was organized in part by Christel H. Uittenbogaart, M.D. (AAI '84), professor, David Geffen School of Medicine at the University of California, Los Angeles; Sunny Shin, Ph.D. (AAI '12), associate professor, University of Pennsylvania School of Medicine; and Daniel B. Stetson, Ph.D. (AAI '09), associate professor, University of Washington.

Lora Hooper, Ph.D., of the University of Texas Southwestern Medical Center, delivered the Dan H. Campbell Memorial Lecture.

AAI supported 10 poster awards and five podium presentation awards at MCI this year. Recipients of the Ray Owen Poster Award included:

- Jessica Huang, graduate student, University of Washington
- Nicholas Hubbard, graduate student, University of Washington
- Antonia Bass, graduate student, University of Pennsylvania
- Clint Valencia, graduate student, University of California, Merced
- Trever Greene, Ph.D. (AAI '19), postdoctoral fellow, University of California, San Diego
- Peter Morawski, Ph.D. (AAI '15), postdoctoral fellow, Benaroya Research Institute
- Meera Shenoy, Ph.D., postdoctoral fellow, University of Washington/Fred Hutchinson Cancer Research Center
- Tayla Olsen, young investigator, University of Washington
- Elektra Robinson, young investigator, University of California, Santa Cruz
- Jennifer Elliott, young investigator, Washington University School of Medicine

Recipients of the Ray Owen Young Investigator Award were:

- Jackie Carozza, student, Stanford University
- Wei Hu, Ph.D., postdoctoral fellow, Memorial Sloan Kettering Cancer Center
- Bo Liu, postdoctoral fellow, University of California, Berkeley
- CJ Cambier, postdoctoral fellow, Stanford University
- Frank Soveg, graduate student, University of Washington



At MCI, recipients of the Ray Owen Poster Award (from left): Olsen, Greene, Bass, Huang, Hubbard, Valencia, Morawski, Robinson, and Shenoy (Not pictured: Elliott)



At MCI, recipients of the Ray Owen Young Investigator Award (from left): Carozza, Soveg, Hu, Cambier, and Liu



AAI Intersect Fellowship Program for Computational Scientists and Immunologists

Fellowship Overview

Recognizing the vital role cross-trained scientists play in furthering immunology research, this fellowship program is intended to promote understanding and communication between immunology researchers and computational scientists. A PI may apply for a one-year fellowship, which will support a postdoctoral fellow trained in basic bench research to train in computational science, or a postdoctoral fellow in computational science to train in an immunology research lab to learn basic immunological principles and laboratory techniques. Reciprocal six-month exchanges between labs will also be considered.

APPLICATIONS OPEN **JUNE 1**
APPLICATIONS CLOSE **SEPTEMBER 1**

Eligibility

One of the collaborating PIs must be an AAI member in good standing. If the PI is a research immunologist, he/she must be independent. Applicants may request salary support for a maximum of one postdoctoral fellow for one year, or two postdocs for six months each.

Trainees must be in years one through five of postdoctoral training in the physical/mathematical/computational sciences, immunology, or related fields. Postdoctoral fellows who have completed five years of training and transitioned into a second postdoctoral position will be considered on a case-by-case basis.

Review Process

Award consideration is based on a combination of the qualifications of the applicant, the merit of the PI's proposed project, the potential of the trainee, and the quality of the training environment.

**For more information or to apply, visit www.aai.org/Intersect.
Please direct inquiries to fellowships@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.

AAI Announces Winter 2020 Travel for Techniques Awardees

AAI is pleased to announce the most recent AAI Travel for Techniques Awards recipients, selected from among applicants during the program's Winter 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.

Travel for Techniques Award applications are reviewed in three cycles annually—winter, spring, and fall. Details about applying for the AAI Travel for Techniques Award are available at www.aai.org/TravelforTechniques.

AAI extends congratulations to:



Rodney P. DeKoter, Ph.D. (AAI '06)
Professor, Western University,
London, Ontario, Canada

Destination: The laboratory of Dr. Alexander Van Oudenaarden, Hubrecht Institute, The Netherlands

Technique: Single cell RNA-seq analysis

Application: To study gene expression changes in B cell fate decisions



Todd A. Triplett, Ph.D. (AAI '19)
Instructor, University of Texas at Austin Dell Medical School

Destination: The laboratory of Dr. Atul Butte, University of California, San Francisco, School of Medicine

Technique: Single cell RNA-seq analysis

Application: To identify unique T cell subsets from T cell acute lymphoblastic leukemia patient samples



Félix E. Rivera-Mariani, Ph.D. (AAI '17)
Assistant Professor, Larkin University,
Miami, FL

Destination: The laboratory of Dr. Joe G.N. Garcia, University of Arizona

Technique: Mesoscale platform for biomarker discovery

Application: To examine the role of environmental pollutants in inducing peripheral blood pro-inflammatory signatures



Edwin Chi-Keung Wan, Ph.D. (AAI '18)
Assistant Professor, West Virginia University

Designated Traveler: Kelly L. Monaghan (AAI '19), graduate student

Destination: The laboratory of Dr. Vanja Lazarevic (AAI '11), National Cancer Institute, NIH

Technique: Isolation of mouse spinal cord meninges for microscopic analysis of immune cells

Application: To study immune cell interactions at the spinal cord meninges during neuroinflammation

AAI Fellowship Program for Career Reentry



Fellowship Overview

This fellowship program provides one year of salary support to postdoctoral fellows who have taken a leave of absence of one year or more due to military obligations, personal or family medical leave, or other related family circumstances. These reasons may include recovering from a serious illness, providing elder or child care, fulfilling a military obligation, or relocating due to a spousal career transition.

Eligibility

- An applicant must have a tentative written offer of appointment as a postdoctoral fellow.
- The fellowship must be in immunology or a related field.

Award consideration is based on a combination of the merit of the research project, quality of the training environment, research and career accomplishments, and career potential.

APPLICATIONS OPEN **JUNE 1**
APPLICATIONS CLOSE **SEPTEMBER 1**



For more information or to apply, visit www.aai.org/Reentry.
Please direct inquiries to fellowships@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.

Using Concept Maps to Encourage the Meaningful Interpretation of Immunology Facts and Processes



Nicholas A. Pullen, Ph.D., Assistant Professor, University of Northern Colorado, School of Biological Sciences, Greeley, CO

The breadth of physiological impact and the specific, fine details of immunology are major barriers for students new to the field of immunology. It is attractive for some to embark on rote learning of the

facts. While memorization is better than nothing, that approach offers little insight into the details in the context of a grander picture. Evidence shows that the interpretation of the meaning of facts as they relate to each other is essential to efficient cognitive learning.¹

Our institution provides a series of required graduate physiology courses enrolling 35 to 40 students across master's and doctoral programs in biology, education, biomedical science, and exercise science. BIO553 focuses on distributed control systems, with only the last quarter of the course dedicated to immunology. In addition to the challenge of relatively little time, students' backgrounds in immunology and basic science vary widely. To encourage them to search for and interpret the meaning of facts in a scaffolded manner, I employ a type of free-form graphic organizer, or concept map.

Concept maps as a deliberate instructional tool were introduced by Joseph Novak and Bob Gowan, interestingly in the context of students learning science.² In response to an overarching content theme, students illustrate their current knowledge with related ideas/facts represented as nodes (often circles, bubbles, or illustrations such as of a cell) connected by processes (often lines or arrows). Concept maps may be very hierarchical in appearance (e.g., reflecting strong top-down tree thinking), or might not (e.g., displaying an expanding, web-like, fractal pattern with many nested and interconnecting nodes).

My students independently produce concept maps along three classical themes in basic immunology: innate, adaptive, and overlap. They may produce one large map or several, so long as the maps fit the guidance of a detailed rubric. Essential elements of the rubric include significant penalty for regurgitation of web/textbook Venn diagrams, points for complexity of connections (number of secondary and tertiary relationships), and guidance for the minimum numbers of primary connections and nodes. I believe it is important to minimize points awarded for aesthetics, so long as the map(s) can be understood, and I do not restrict the medium of production.

There is a substantial heterogeneity in concept map outputs,³ which is a good indicator of individuals' cognitive processing, difficult as that can be to interpret. For large enrollment classes, evaluation can be done in groups, with the understanding that the individual's processing of the content is not being assessed strictly in terms of the concept map outputs.

Instructors should reflect on how often and/or over what period of time concept maps should be assigned, constructed, and used. Similarly, they should weigh: (1) how much detail to require, (2) when to implement the concept map, (3) whether to use the map as a formative assessment, and (4) which types of rubrics to include and their detail. Additionally, instructors are strongly encouraged to consult straightforward resources such as those found in the references.⁴⁻⁶

It is very important to model an example in class early on to foster students' discernment of where to start and what relationships are relevant. As with other types of assessment, it is also important to have a clear and detailed rubric. Ultimately, concept maps are useful for spotting misconceptions in the classroom and quickly re-tooling the presentation of content. Students have commented that this is a helpful exercise, with some applying it to other coursework.

Finally, concept maps are a rich data source for those interested in educational research. Such a coding project is underway on the part of graduate students in my lab in connection with a physiology course for pre-nursing students.

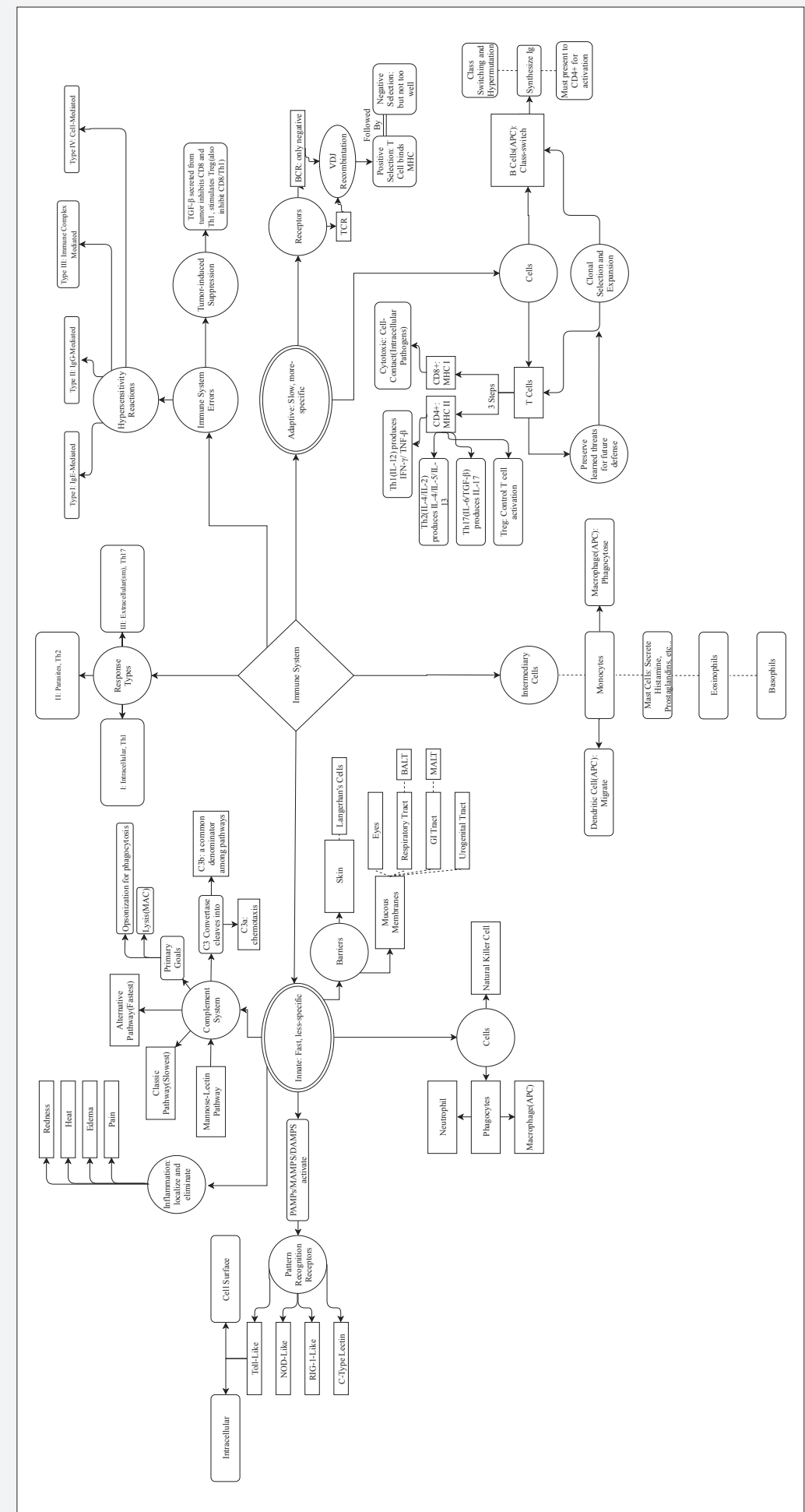
Acknowledgments

Emily A. Roysse and Alexandra A. Vita, doctoral students working diligently on the aforementioned research project, have brought to my attention some of these resources.

References

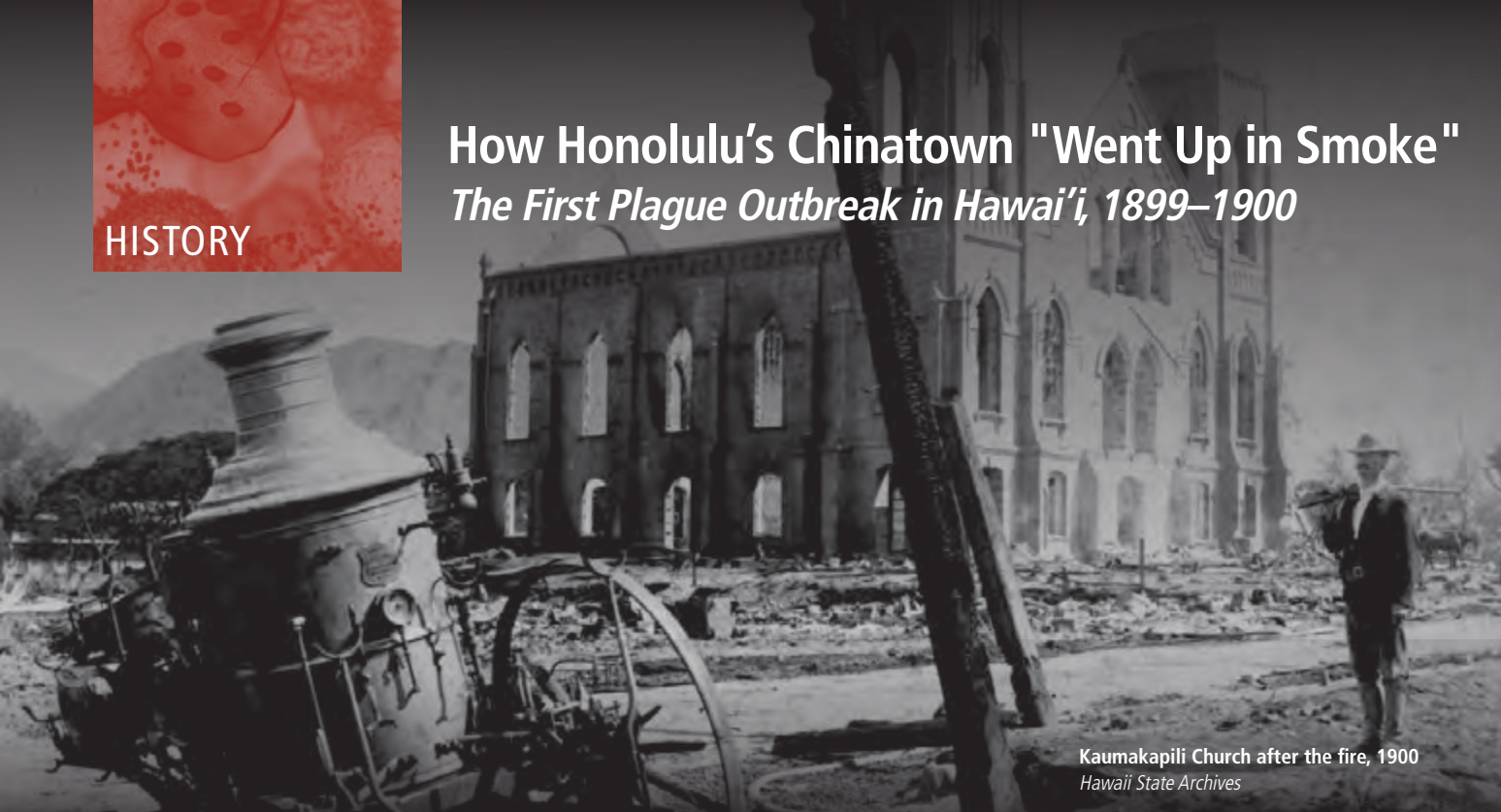
- Davis JR & Arend BD. *Facilitating Seven Ways of Learning*. 2013. Stylus. Chapter 5 efficiently, and practically, discusses Cognitive Learning.
- Novak JD & Gowan DB. *Learning How to Learn*. 1984. Cambridge University Press.
- Nesbit JC & Adesope OO. Learning with Concept and Knowledge Maps: A Meta-Analysis. 2006. *Review of Educational Research* 76(3) 413-48.
- Angelo TA & Cross KP. *Classroom Assessment Techniques: A Handbook for College Teachers*. 1993. Wiley. Pages 197-202 model concept map implementation.
- Novak JD & Cañas AJ. The Theory Underlying Concept Maps and How to Construct and Use Them, Technical Report IHMC Cmap Tools 2006-01 Rev 01-2008, Florida Institute for Human and Machine Cognition, 2008, available at: <https://cmap.ihmc.us/docs/theory-of-concept-maps.php>. This provides a contemporary treatment of concept maps with examples by Novak.
- www.draw.io (by JGraph Ltd.). This free, high-quality, web-based diagramming resource plugs into Google Drive, OneDrive, or syncs locally to a hard drive.

Student Example: Concept Map of Immune System



How Honolulu's Chinatown "Went Up in Smoke"

The First Plague Outbreak in Hawai'i, 1899–1900



Kaumakapili Church after the fire, 1900
Hawai'i State Archives

IMMUNOLOGY2020™ was to have featured a history exhibit exploring the interplay between immunology and public health in Hawai'i, including a retrospective on the 1899–1900 bubonic plague quarantine in Honolulu. Following the unfortunate cancellation of the AAI annual meeting due to public health restrictions during the COVID-19 pandemic, the History Office of AAI is pleased to present the following, expanded version of the exhibit for members and other readers of the AAI Newsletter.

Bubonic plague (*Yersinia pestis*), responsible for the worst pandemics in history, was unknown in Hawai'i until the last days of the 19th century. When it appeared there, local government health authorities reacted swiftly and severely. The resulting quarantines and public health measures turned into a local disaster and a tragedy for Honolulu's large Chinese population.

The Third Plague Pandemic

When a plague outbreak began in China in 1860, triggering the world's third plague pandemic, experience from previous outbreaks in other parts of the world demonstrated that the disease was more than a substantial health threat; it was one that conveyed terror of historic proportion. Death from the disease was inevitably painful and gruesome, and depending on the virulence of the strain, fatality rates could range from 35% to 90%. The populations previously struck by pandemic bubonic plague had experienced mortality rates so high that it was difficult to count the total deaths.

The Plague of Justinian (biovar *Antiqua*) occurred from 500 to 700 CE, peaking in 541–542, and resulted in 25–100 million deaths. The Black Death (biovar *Medievalis*), which occurred during the 14th century, peaked between 1347–1351 in Europe and resulted in 75–200 million deaths in Asia, North Africa, the Middle East, and Europe.

As news of the emerging outbreak in China began to spread, public health officials around the world became alarmed,

particularly those in Asia and the Pacific Islands. By the mid-1890s, the third plague pandemic was well underway, traveling via overland and shipping trade routes to countries around the globe, including Hong Kong, India, Egypt, Japan, South Africa, France, Great Britain, and Australia.¹

This pandemic, however, provided researchers the ability to study the plague at the microscopic level for the first time. In 1894, bacteriologists Shibasaburo Kitasato and Alexandre



Chinatown before the fire
Hawai'i State Archives

Yersin traveled to Hong Kong to study the plague outbreaks in Asia and—independently of one another—managed that year to identify the bacillus responsible for the disease.² A year later, Paul-Louis Simond, a Pasteur researcher in Bombay, India, demonstrated that fleas were the vector that transmitted the plague bacterium.

Precautions in Hawai'i

The growing threat of plague outbreaks led the Hawaiian government (see sidebar pg. 34) to intensify inspections of all ships in Chinese and Japanese ports bound for Hawai'i. Sand Island in Honolulu Harbor became "Quarantine Island," where all ships from ports where outbreaks had occurred were held for a week.³ Initially, the measures proved effective: although plague spread throughout other Pacific islands, Hawai'i remained apparently safe.⁴

Unknown to nearly everyone in Honolulu, however, plague quietly arrived in the city's harbor in June 1899 on the Japanese passenger liner *Nippon Maru* bound for San Francisco. The first signs had been detected at the ship's first stop in Nagasaki, where a teenage passenger died on May 26. He had no outward signs of disease, but Japanese medical officers made a diagnosis of bubonic plague by visual examination of his glands under a microscope.⁵ The *Nippon Maru* was then held in a week-long quarantine, during which the ship was washed with carbolic acid and all its contents steamed. Only after the decontamination was it allowed to continue its voyage to Honolulu.

Another passenger died on the approach to Hawai'i, and upon the vessel's arrival, the Hawaiian government's bacteriologist found "considerable numbers of a short bacillus, rounded at both ends, and like the bacillus of bubonic plague."⁶ No cargo was allowed off the ship, mainland-bound passengers were not permitted to disembark, and the few Honolulu-bound passengers were transferred to a separate quarantine ship. However, no efforts were made to prevent rats from escaping the quarantined ship. Health authorities in Honolulu decided not to make this case public.⁷

Chinatown, Honolulu

Chinese visitations to Hawai'i date to the late 18th century, when Chinese sailors arrived in the islands along with the earliest European and American explorers and traders. The

first permanent residents came in 1823 and, by 1840, 10% of the 400 foreigners living in Honolulu were Chinese. The rise of the sugar industry in the 1850s brought a new wave of Chinese laborers seeking work on the plantations. Most did not work the sugar fields for long; they found work on smaller farms or went into business for themselves. By 1884, 18,254 Chinese residents made up 22.7% of Hawai'i's population and represented the largest non-Hawaiian ethnic group in the islands.⁸

Most Chinese in Honolulu lived and worked in the city's Chinatown, a 14-block neighborhood bordered by Honolulu Harbor to the west, Nu'uuanu Stream to the north, and downtown Honolulu to the south. It was a densely populated district, home to approximately 7,000 people and many Chinese- and Japanese-owned businesses by the turn of the century.⁹

Plague and Quarantine in Honolulu

The first case of the flea-borne disease emerged when You Chong, a bookkeeper in Honolulu's Chinatown, fell ill on December 9, 1899, and developed telltale buboes before dying three days later. Four neighbors succumbed quickly

thereafter. By that time, plague had likely been spreading quietly among the local rat population for months. Unfortunately, although the bacillus had been identified five years earlier, still very little was understood about how it behaved.¹⁰

On December 13, Honolulu newspapers announced the threat of plague and asked for volunteers to report to the Territorial Board of Health (BoH) to begin inspections of

properties.¹¹ Two days later, they confirmed that several people had indeed died from plague. The BoH closed inter-island ship traffic, sealed off Chinatown, and restricted travel in and out of Honolulu. A corps of volunteers began inspections to find any additional cases. Believing that plague germs could live inside walls, under floors, and amongst personal belongings, they sprayed premises with various disinfectant solutions, including sulfuric and carbolic acids.¹² When no further cases were found for a week, the quarantine was lifted on December 19.

A Second Wave and Quarantine

The week of Christmas, however, brought at least four new cases of plague. The BoH blamed the residents of



Cordon sanitaire of Chinatown, c. Dec. 1899 – Jan. 1900
Hawai'i State Archives



Belongings in the street; cordon sanitaire at end of street, c. Dec. 1899 – Jan. 1900
Hawai'i State Archives

Chinatown for the outbreak, reflecting long-held racist stereotypes about their standards of cleanliness or the foods they ate.¹³ The board also distributed a multi-lingual pamphlet promoting cleanliness and citing Kitasato's research on plague.¹⁴ By 3:00 AM on December 28, National Guard troops enforced a *cordon sanitaire*—a literal rope barrier in the streets—to prevent 10,000 people from leaving the 14-block Chinatown neighborhood.¹⁵ News of the situation was slow to arrive to the mainland: on December 30, while the new quarantine was in effect, stateside newspapers proclaimed that “bubonic plague has been stamped out in Honolulu.”¹⁶

Sanitary Fires

The situation took an ever-darker turn when the BoH, frustrated by the pace of abatement and hoping to reopen Honolulu more quickly, began setting fire to homes and businesses where plague was found. For the first three weeks of January, buildings were destroyed by “sanitary fires” every day. Readers of the *Honolulu Advertiser* could track the intentional demolition of Chinatown through maps updated daily to show which blocks had been burned or marked for burning.

Inferno

This tactic took a disastrous turn on January 20 when strong winds blew flying embers from one of the fires onto the wooden steeples of the recently constructed Kaumakapili

Church.¹⁷ As if a spark had landed in a tinderbox, the gothic church quickly burned to the ground and flames spread to neighboring buildings. The out-of-control Chinatown inferno generated heat so intense it melted metal cookware, but the citizen guards wielding axe handles insisted on maintaining the quarantine line until the fire forced everyone to flee.¹⁸ The blaze destroyed 60 acres of Chinatown and the surrounding neighborhoods, leaving more than 4,000 people homeless and only five gutted buildings standing.¹⁹

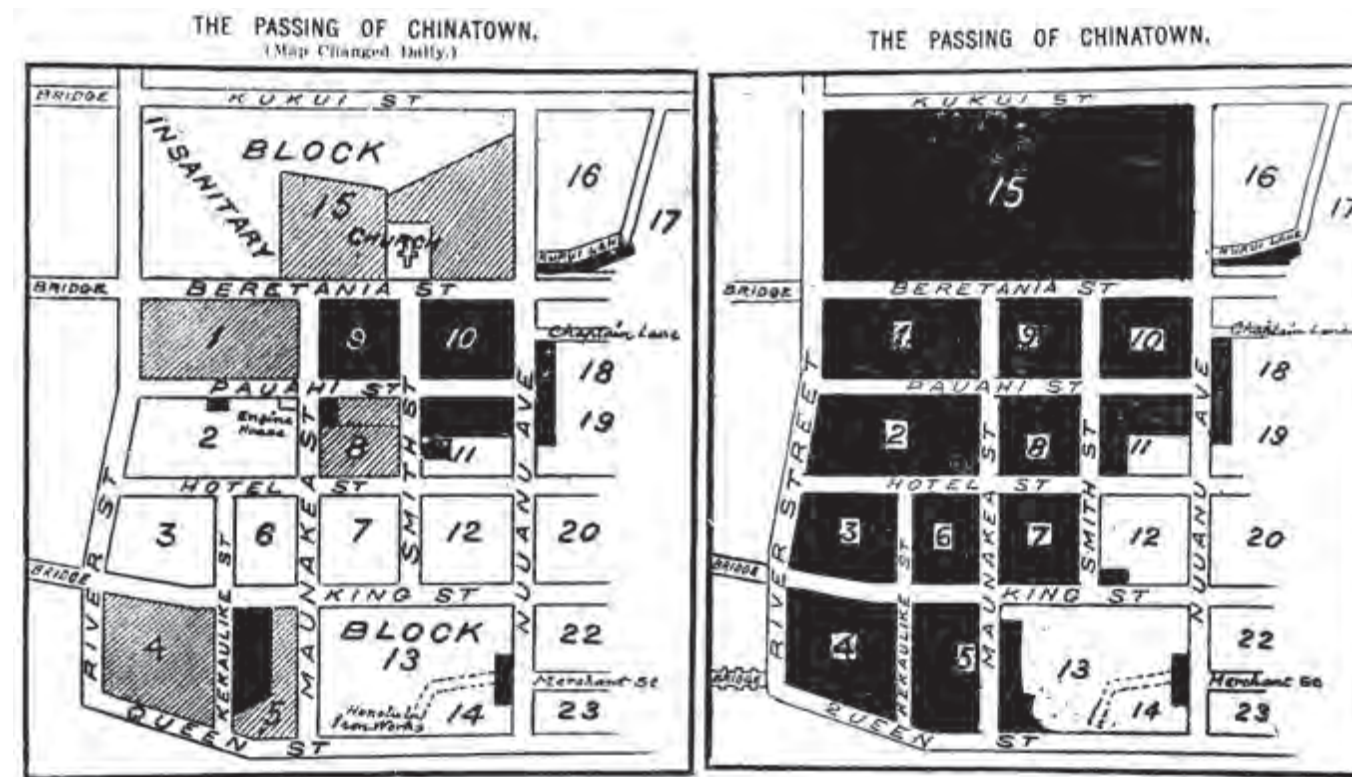
Even after the fire was extinguished, the BoH continued to set controlled burns in the emptied district, fortunately with no further conflagrations.²⁰ With the horrific failure of the quarantine measures, authorities placed the former residents of Chinatown into detention camps to minimize the spread of the disease. Cases nevertheless continued to appear for the next two months, including on the big island of Hawai'i.²¹ Ultimately, the BoH reported that the Honolulu plague outbreak produced a total of 71 diagnosed cases and 61 deaths through March 31, 1900.

Plague Reaches the United States

Just after midnight on March 6, 1900, bubonic plague arrived in the continental United States. In San Francisco, the dead body of Chick Gin, a 41-year-old Chinese laborer, was discovered in the basement of the Globe Hotel, a run-down boarding house in Chinatown. This discovery set in motion public health measures, including quarantines; *cordon sanitaire*; intensive disinfecting efforts that included burning personal property; and racist stereotypes that were similar, if not more pronounced, than those that recently



Fighting the fire in Chinatown, Jan. 1900
Hawai'i State Archives



"The Passing of Chinatown" before (January 20) and after (January 24) the fire, *Honolulu Advertiser*, 1900
Hawai'i State Archives

ended in Honolulu. It also led to the establishment of a federal plague laboratory in 1903, which would become home to a number of future AAI members and their research over the next few decades.²²

George McCoy and Anti-plague Efforts in Hawai'i

In October 1911, George W. McCoy (AAI 1915, president 1922–23) arrived in Hawai'i to lead the Leprosy Investigation Station, but he also brought with him years of experience with plague.

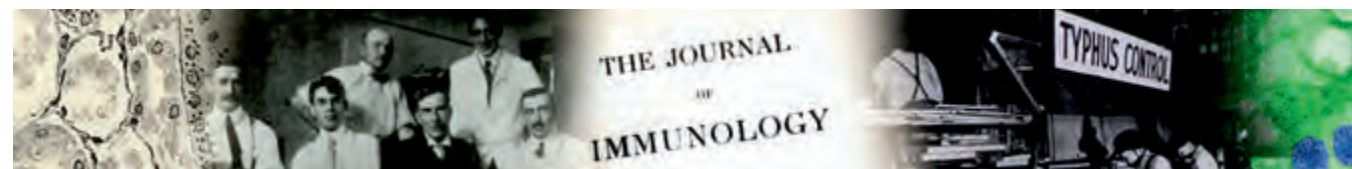
Shortly after the 1899–1900 Honolulu plague outbreak, McCoy had been sent to the Philippines to serve as a quarantine officer on his first assignment with the U.S. Public Health Service (PHS). In the Philippine Commission's annual report to the PHS, McCoy described his frustration with the ineffective policies employed against diseases such as cholera.²³ He was later assigned to postings in China and Japan, where he served as one of the inspectors checking

ships bound for Hawai'i for indications of plague, and then to the Plague Laboratory in San Francisco, which he led from 1908 until his posting to Honolulu in 1911.²⁴

Plague had continued to show up occasionally in the rural areas of the Hawaiian Islands, so McCoy instigated a survey of cases both prior to his arrival and during his tenure there. His findings showed that the disease was not limited to any ethnic group; the victims were ethnically and economically diverse.²⁵ Large-scale rodent reduction efforts resulted in the capture and extermination of tens of thousands of rats and mice. From 1910 to 1913, one in every 1,442 rodents examined was found to be infected with plague.²⁶

A New Concept in Plague Transmission

By the 1930s, the concept developed by Karl F. Meyer (AAI 1922, president 1940–41) of a rodent population acting as a reservoir of disease had yielded to more effective plague abatement techniques,²⁷ which were employed in Hawai'i by the PHS and BoH to successfully reduce rat populations and, consequently, potential human exposure to plague.²⁸



Want More AAI History?

Visit www.aai.org/history for the AAI Timeline, which chronicles 100 years of immunology history, more articles, the Oral History Project, and more.

A Chronological Overview of Hawai'i and Public Health

Epidemic diseases have devastated the native population of Hawai'i since 1778, when Captain James Cook first landed in the islands. Centuries of isolation meant that Hawaiians were particularly vulnerable to diseases from all over the world. Estimates of the native population in 1778 range from 300,000 to nearly 700,000. Just 40 years later, the figure had dropped to about 150,000, and by 1900, to only 28,800. Aggressive public health measures prevented an even worse decline, and today the Native Hawaiian population has returned to nearly 300,000.

Since first contact with Europeans, the islands became a strategic trading and military location in the middle of the Pacific Ocean. By the late 19th century, as U.S. naval power increased, Hawai'i became more attractive to the expansionist nation. American business and government interests incrementally seized control of Hawai'i, which impacted every level of governmental control, including public health.

300–500 AD	Polynesians first inhabit Hawaiian Islands	1859	Queen's Hospital, named for Queen Emma, is founded to provide medical care to the Hawaiian people
1778	British explorer Captain James Cook lands in Hawai'i; he publishes an account of the "Sandwich Islands," providing the earliest documentation of European contact with the islands	1866	Leprosy patients are first sent to Kalawao, Moloka'i
1785	The first trading ship lands in Hawai'i on its way to China; sandalwood trade and whaling soon become major industries	1870	Scarlet fever kills "great numbers" of Hawaiians
1804	"Okuu" (probably cholera) epidemic kills nearly 15,000	1872	King Kamehameha V dies without an heir, ending the House of Kamehameha
1810	Kamehameha formally establishes Kingdom of Hawai'i and proclaims himself king after a 15-year struggle with the <i>ali'i</i> (chiefs)	1874	Riots during the subsequent succession crisis are suppressed by U.S. and British troops; Kalākaua becomes King of Hawai'i
1819	King Kamehameha II abolishes the <i>kapu</i> —the traditional religious and legal system that governed all aspects of Hawaiian life	1875	The Reciprocity Treaty signed between the United States and Kingdom of Hawai'i provides for duty-free import of Hawaiian agricultural products into the United States and of U.S. agricultural products and manufactured goods into Hawai'i; the growth and consolidation of sugarcane plantations and processing plants soon follows
1820	The first Protestant missionaries arrive from the United States	1884	The Reciprocity Convention extends the Reciprocity Treaty (1875) and provides the United States exclusive rights to Pearl Harbor
1828	The <i>Aedes</i> mosquito is first identified in Hawai'i	1887	King Kalākaua is forced to sign a new constitution (the "Bayonet Constitution") that strips the monarchy of power and severely restricts voting rights. The constitution was written by the Hawaiian League, a group of mostly Hawaiian-born American and British businessmen and lawyers who favor annexation by the United States
1835	The first commercially successful sugar plantation is opened by Ladd and Company	1888	Whooping cough kills 104
~1840	Leprosy is first diagnosed in Hawai'i	1890	Diphtheria kills 104
1845–49	Influenza, dysentery, measles, and whooping cough kill approximately 10,000	1891	King Kalākaua dies and is succeeded by his sister, Queen Lili'uokalani, who refuses to recognize the Bayonet Constitution and calls for a replacement
1848	King Kamehameha III enacts the <i>Mahele</i> , a land division act that introduces legal provisions for private ownership of land, opening the way for rapid growth of sugar plantations		
1853–54	A smallpox epidemic kills approximately 10,000; smallpox vaccination is made mandatory		

Background image: Kaumakapili Church before the fire
Hawai'i State Archives

1893	The U.S. Marines arrive in Hawai'i at the request of the Hawaiian League, effectively blocking Queen Lili'uokalani from continuing her rule; the Provisional Government of Hawai'i is formed; although the U.S. Congress, in 1894, found no party guilty of a coup against the kingdom, a joint Apology Resolution of Congress nearly a century later (1993) accepted U.S. responsibility for overthrowing the sovereign kingdom
1894	The Republic of Hawai'i is established
1897	Government-led food inspection begins; Chinese Hospital opens
1898	The Spanish-American War begins (April 25); the U.S. Territory of Hawai'i is created when the United States annexes the islands (July 7); Pearl Harbor emerges as a key naval base for the war
1899	Bubonic plague kills 61; first sewers are laid
1918–20	Influenza pandemic kills 2,338
1936	Measles outbreak kills 205
1941	The United States enters the Second World War after the attack on Pearl Harbor (December 7)
1954	Democrats take control of the Territorial Legislature and push for statehood
1959	Hawai'i becomes the 50th state of the United States



Plague Doctor, physician wearing a 17th century plague preventive costume
Wellcome Library

References

- Howard Markel, *When Germs Travel: Six Major Epidemics That Have Invaded America and the Fears They Have Unleashed*, (New York: Vintage Books, 2004), 57.
- David J. Bibel and T. H. Chen, "Diagnosis of Plague: an Analysis of the Yersin Kitasato Controversy," *Bacteriological Review* 40, no. 3. The bacterium was initially named *Pasteurella pestis* by Alexandre Yersin in honor of the Pasteur Institute where he worked. In 1967 it was renamed *Yersinia pestis* in honor of Yersin's contributions.
- James C. Mohr, *Plague and Fire: Battling Black Death and the 1900 Burning of Honolulu's Chinatown* (New York: Oxford University Press, 2005), 16.
- In 1899, Brazil and Portugal reported their first deaths from the pandemic.
- Robert Barde, "Prelude to the Plague: Public Health and Politics at America's Pacific Gateway, 1899," *Journal of the History of Medicine and Allied Sciences* 58, no. 2: 161.
- Barde 162.
- Mohr 30.
- Eleanor C. Nordyke and Richard K. C. Lee, "The Chinese in Hawai'i: A Historical and Demographic Perspective," *Hawaiian Journal of History* 23: 202.
- "Chinatown Historic District (Honolulu)," U.S. National Park Service, last updated August 16, 2019, <https://www.nps.gov/places/chinatown-historic-district-honolulu.htm>.
- Mohr 30, 87.
- Mohr 55.
- Mohr 87.
- Jerrold M. Michael, "The 1899–1900 Plague Epidemic in Hawaii, USA," *Asia Pacific Journal of Public Health* 26, no. 1: 10.
- Mohr 79.
- Mohr 80.
- "Bubonic Plague Has Been Stamped Out in Honolulu," *San Francisco Examiner*, December 30, 1899.
- The first Kaumakapili Church, constructed of adobe with a thatched roof, was dedicated on August 29, 1839. In 1881 the church was torn down so that a more permanent church could be built. The new church was built in the gothic style and constructed of wood-frame and brick. It was dedicated on June 10, 1888. "History of Kaumakapili Church," Kaumakapili Church, accessed May 5, 2020, <http://www.kaumakapili.org/about-us/history.html>.
- Mohr 138.
- Mohr 141.
- "Chinatown Historic District (Honolulu)."
- George W. McCoy, "Plague in Hawaii: With Special Reference to Its Occurrence on the Northern Coast of the Island of Hawaii," *Public Health Reports* 29, no. 25: 1629.
- Tilli Tansey, "Plague in San Francisco: rats, racism and reform," *Nature* 568, no. 7753: 455.
- "Fifth Annual Report of the Philippine Commission. 1904, Part 2," (Washington: Government Printing Office, 1905), 292.
- "McCoy, George W.," Office of History, National Institutes of Health, accessed May 5, 2020, <https://onih.pastperfectonline.com/byperson?keyword=McCoy%2C+George+W.>
- McCoy 1631.
- McCoy 1634.
- To learn more about Meyer's concept of reservoirs of disease, see Charles Richter and John S. Emrich, "Karl F. Meyer: The Renaissance Immunologist," *AAI Newsletter*, June/July 2018, 22–7.
- A. L. Dopmeyer, "Plague Eradicative Measures on the Island of Maui, Territory of Hawaii," *Public Health Reports (1896–1970)* 51, no. 45: 1547.

July 31

ACR-CRI Lloyd J. Old Award in Cancer Immunology

- **Prize/Award**—In recognition of active scientists whose outstanding and innovative research in cancer immunology has had a major impact on the cancer field and has the potential to stimulate new directions in cancer immunology, a \$10,000 honorarium, presentation of award lecture at the AACR Annual Meeting 2021, and meeting travel support for recipient and guest
- **Eligibility**—Individual investigators who are cancer immunologists, maintain an active research program, have a record of recent publications, and are currently affiliated with any U.S. or overseas institution in academia, industry, or government involved in cancer research, cancer medicine, or cancer-related biomedical science
- **Details**—www.aacr.org/awards/aacr-cancer-research-institute-lloyd-j-old-award-in-cancer-immunology/
- **Contact**—(215) 446-7128; linda.stokes@aacr.org

September 1

AAI Fellowship Program for Career Reentry

- **Prize/Award**—In support of immunologists' reentry into the workforce after a qualifying lapse of research or research training, multiple awards providing one year of salary support to postdoctoral trainees who have taken a leave of absence of one year or more for family-related issues, medical absences, or military obligations
- **Eligibility**—Applicants with a tentative written offer of appointment as a postdoctoral fellow in immunology or a related field; trainees funded under this program may not be supported concomitantly by other fellowships that provide salary compensation
- **Details**—www.aai.org/ReentryFellowship
- **Contact**—(301) 634-7178; fellowships@aai.org

September 1

AAI Intersect Fellowship Program for Computational Scientists and Immunologists

- **Prize/Award**—Multiple postdoctoral fellowship awards providing one year of salary support, affording immunology researchers the opportunity to train in computational science and/or computational scientists to train in immunology

- **Eligibility**—At least one of the collaborating PIs seeking support must be an AAI member in good standing; application may be for support of a postdoctoral fellow trained in basic bench research to undertake one year of training in computational science, or a postdoctoral fellow trained in computational science to spend one year in an immunology research lab to learn basic immunological principles and laboratory techniques; reciprocal six-month exchanges between labs will also be considered; trainees should be in years 1–5 of postdoctoral training in the physical/mathematical/computational sciences, immunology, or related fields; trainees funded under this program may not be supported concomitantly by other fellowships that provide salary compensation
- **Details**—www.aai.org/IntersectFellowship
- **Contact**—(301) 634-7178; fellowships@aai.org

September 15

Fulbright Postdoctoral Fellowship at Weizmann Institute for Science

- **Prize/Award**—Multiple fellowship awards of \$47,500 per year for up to two years for U.S. postdoctoral scholars to pursue research at the Weizmann Institute for Science; support may include additional allowances for qualifying travel and/or relocation expenses
- **Eligibility**—Researchers who hold a Ph.D. received no earlier than August 2016, seek postdoctoral training in one of the scientific disciplines (including biochemistry, biology, chemistry, and others) offered at the Weizmann Institute, and have secured an invitation from the institute to undertake the research proposed in the fellowship application
- **Details**—<https://awards.cies.org/content/fulbright-postdoctoral-fellowship-weizmann-institute-science-0>
- **Contact**—(202) 686-4021; middleeastnorthafrica@iie.org

September 15

Lupus Research Alliance Global Team Science Award

- **Prize/Award**—Up to three awards of up to \$3 million each over three years in support of ambitious, interdisciplinary, collaborative, highly synergistic projects that push the boundaries of innovation and bridge research and clinical efforts in lupus; the funding supports established investigators applying as teams

to work across scientific disciplines and geographies to make major advances in understanding the heterogeneity of systemic lupus erythematosus

- **Eligibility**—Investigators apply through letters of intent for 4-month planning grants to assemble competitive teams to develop and submit subsequent applications for full awards funding; applicants must hold an M.D., Ph.D., D.V.M., or equivalent degree and a faculty position or equivalent at a domestic or foreign college, university, medical school, non-profit hospital or laboratory, or comparable institution; investigators from any country and of any citizenship may apply; representatives of for-profit entities such as pharmaceutical or biotechnology companies may participate as collaborators but are not eligible to receive financial support through the grant award
- **Details**—www.lupusresearch.org/research-and-clinical-trials/research/funding-opportunities/
- **Contact**—tstaeva@lupusresearch.org

September 30

Wiley Prize in Biomedical Sciences

- **Prize/Award**—A prize of \$50,000 in recognition of breakthrough achievement in pure or applied life science research distinguished by its excellence, originality, and impact on our understanding of biological systems and processes
- **Eligibility**—Exceptional individual scientists or teams whose research has set the standard for excellence while demonstrating significant leadership in the development of research concepts or their clinical application; particular emphasis is placed on research that champions novel approaches and challenges accepted thinking in the biomedical sciences
- **Details**—www.wiley.com/WileyCDA/Section/id-390062.html
- **Contact**—wileyfoundation@wiley.com

October 1

Canada Gairdner International Awards

- **Prize/Award**—Five annual awards of \$100,000 (CAD) each for recipients' personal use, recognizing outstanding biomedical scientists for original contributions to medicine resulting in increased understanding of human biology and disease and in the relief of human suffering; an additional Global Health Award recognizes scientifically based research that has improved the health and well-being of those facing health inequities worldwide

- **Eligibility**—Researchers of any nationality and residing in any country who have produced seminal bodies of work (i.e., the award is not oriented toward recognition of cumulative lifetime achievement); nominations in the area of translational research are welcome

■ **Details**—<https://gairdner.org/awards/international-awards/>

■ **Contact**—(416) 596-9996; nominations@gairdner.org

October 1

CRI Irvington Postdoctoral Fellowship Program

- **Prize/Award**—Multiple awards of \$175,000 each over three years to fund and train young immunologists and cancer immunologists at top universities and research centers around the world; fellows work and continue their training under the guidance of a leading immunologist, who mentors and prepares the fellow for a productive and successful career in cancer immunology; support covers salary, insurance, and other research-related expenses, such as travel to conferences and meetings
- **Eligibility**—Applicants working in areas directly related to immunology or cancer immunology who hold a doctoral degree by the date of award activation and conduct their proposed research under a sponsor holding a formal appointment at the host institution; applicants must have less than five years of relevant postdoctoral experience at the time of award activation (note: M.D. applicants should not include years of residency in this calculation); fellowships must take place at a non-profit institution in the United States or abroad; there are no citizenship restrictions
- **Details**—www.cancerresearch.org/scientists/fellowships-grants/post-doctoral-fellows
- **Contact**—(800) 992-2623; grants@cancerresearch.org

October 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

MEETINGS AND EVENTS

Mark Your Calendar for These Important Dates!

Editor's note: The meetings listed on these pages were still scheduled at press time, but due to the global COVID-19 pandemic, cancellations may occur. Please check an individual meeting's website to confirm that it is still taking place.

2020

VIRTUAL MEETINGS

June 4 – October 3

Society of Leukocyte Biology (SLB) Virtual Meeting

Offering more than 40 hours of scientific and professional development content through October 3.

www.leukocytebiology.org/2020-virtual-meeting

June – September

MICS 2020, Society for Mucosal Immunology (SMI) Webinar Series

Registration is free. Webinars will be presented live; they will be available on demand afterwards to registered participants.

www.socmucimm.org/meetings-events/upcoming-meetings-events/mics-2020/

July 26 – 31

2020 AAI Virtual Advanced Course in Immunology

Register by July 23. Lectures will be webcast at the times indicated in the course schedule, with interactive, live breakout sessions with the lecturers as shown. Course registrants will also have access to an archive of the lectures for 4 weeks after the conclusion of the course.

www.aai.org/AdvancedCourse

November 1 – 4

Now Virtual: Cytokines 2020: 8th Annual Meeting of the International Cytokine and Interferon Society (ICIS)

Details to be announced.

www.seattle.cytokinesociety.org

2020

ON-SITE MEETINGS

September 20 – 24

(Rescheduled from May 2020)

2020 ThymUS International Conference

Grand Wailea Resort, Wailea, HI

www.thymusmeeting.org/2020

November 2 – 6

Obesity Week 2020, The Obesity Society (TOS)

Georgia World Congress Center, Atlanta, GA

<https://obesityweek.com/about/key-dates/>

November 10 – 15

Society for Immunotherapy of Cancer 35th Annual Meeting and Pre-Conference Programs (SITC 2020)

Gaylord National Resort and Convention Center, National Harbor, MD

www.sitcancer.org/education/annualmeeting

November 15 – 19

69th Annual Meeting of the American Society of Tropical Medicine and Hygiene

Metro Toronto Convention Centre, Toronto, Ontario, Canada

www.astmh.org/annual-meeting

The American Association of Immunologists



Future AAI Annual Meetings

Mark Your Calendar for the Premier Annual Immunology Event!

2021



IMMUNOLOGY2021™

May 12–16

Philadelphia, Pennsylvania

2022

IMMUNOLOGY2022™

May 6–10

Portland, Oregon



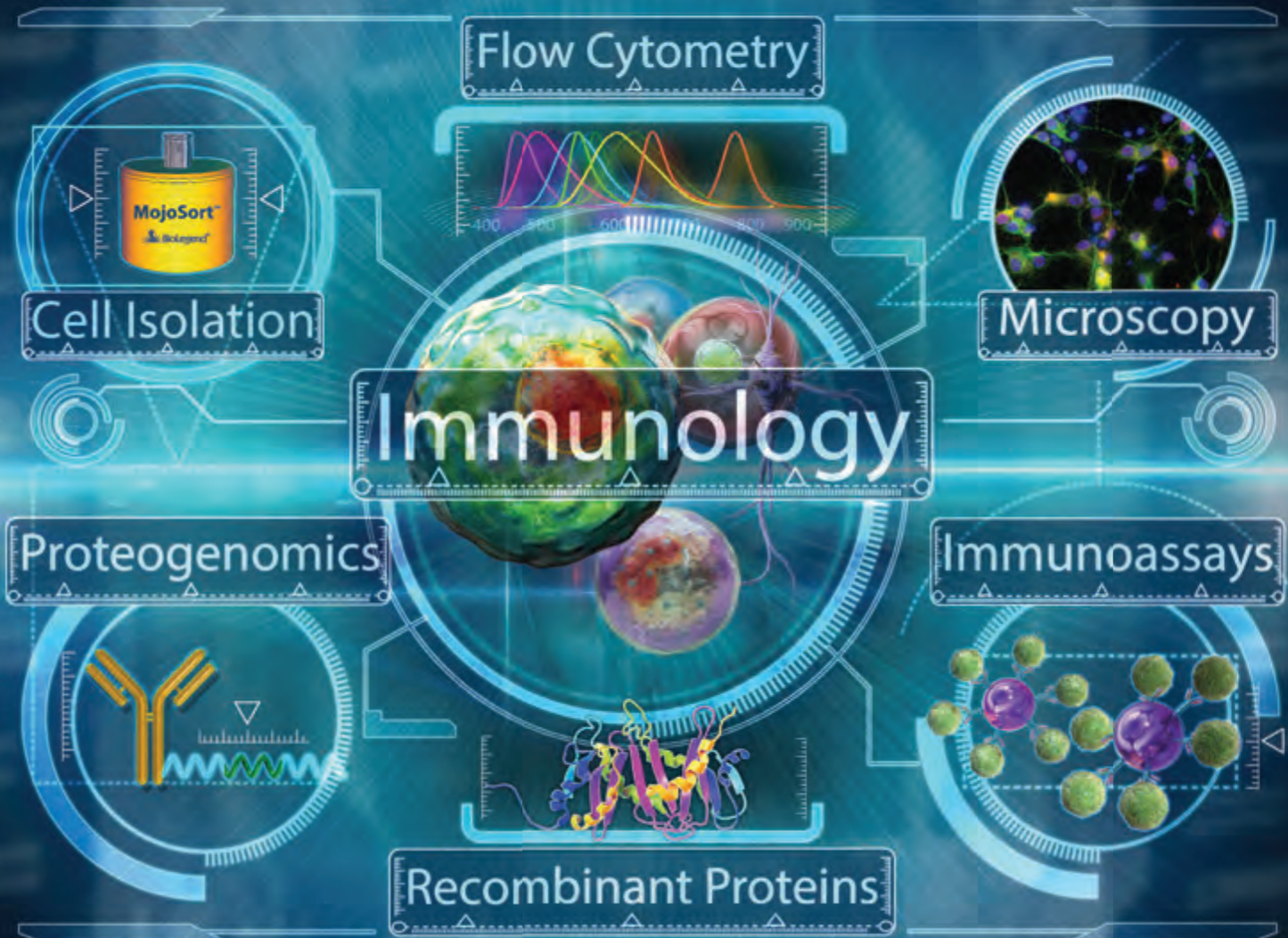
2023



IMMUNOLOGY2023™

May 11–15

Washington, DC



Interface with a World of Discovery

BioLegend provides a total workflow solution supporting immunology research with expertise in a wide range of applications and platforms.

For nearly two decades, BioLegend has been a trusted partner with researchers across the world, providing the applications that have helped yield over 70,000 peer-reviewed publications.

Learn more at: biolegend.com/en-us/immunobiology

With thousands of off-the-shelf reagents and countless customization options, we are equipped to help you characterize immune cells, discover cellular functions, and investigate new mechanisms of action.

BioLegend is ISO 13485:2016 Certified



Toll-Free Tel (US & Canada): 1.877.BIOLEGEND (246.5343)

Tel: 858.768.5800

biolegend.com

08-0084-02

World-Class Quality | Superior Customer Support | Outstanding Value