

AAI

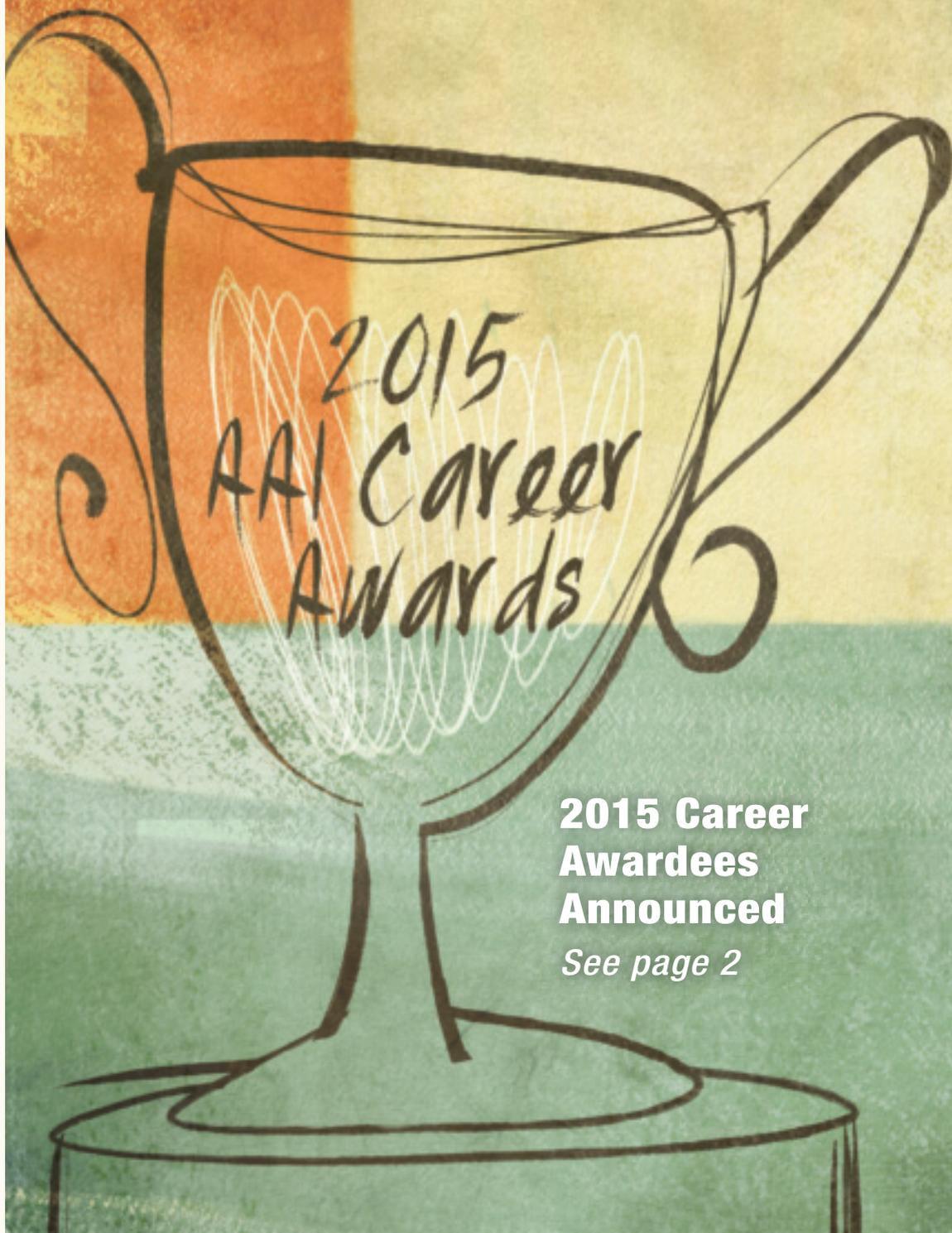
The American
Association of
Immunologists

NEWSLETTER

MARCH 2015

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**2015 Career
Awardees
Announced**

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The American Association of Immunologists

Career Award Recipients for 2015

The American Association of Immunologists proudly announces the 2015 recipients of AAI awards for outstanding research and career achievements.

*The 2015 AAI award winners will be recognized at IMMUNOLOGY 2015™
May 8–12, New Orleans, Louisiana.*



AAI Lifetime Achievement Award

In recognition of a career of scientific achievement and contributions to AAI and fellow immunologists

Jonathan Sprent, M.B.B.S., Ph.D.
Garvan Institute of Medical Research



AAI Distinguished Service Award

For outstanding service to AAI and the immunology community as member and Chair of the AAI Committee on Public Affairs, 2007–2014

Elizabeth J. Kovacs, Ph.D.
Loyola University Chicago Stritch School of Medicine

AAI-Steinman Award for Human Immunology Research



For significant, sustained achievement in immunology research pertinent to human disease pathogenesis, prevention, or therapy

Mary Ellen Conley, M.D.
Rockefeller University

AAI-BioLegend Herzenberg Award



For outstanding research contributions to the field of immunology in the area of B cell biology

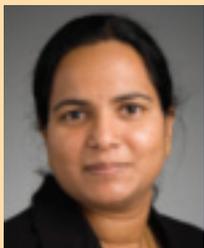
Matthew D. Scharff, M.D.
Albert Einstein College of Medicine

AAI-Thermo Fisher Meritorious Career Award



For outstanding research contributions to the field of immunology

Ronald N. Germain, M.D., Ph.D.
*National Institute of Allergy and Infectious Diseases,
National Institutes of Health*



AAI-BD Biosciences Investigator Award

For outstanding, early-career research contributions to the field of immunology

Thirumala-Devi Kanneganti, Ph.D.
St. Jude Children's Research Hospital



AAI Excellence in Mentoring Award

In recognition of exemplary career contributions to a future generation of scientists

Rafi Ahmed, Ph.D.
Emory University School of Medicine



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FOCUS ON PUBLIC AFFAIRS

AAI Council Visits Capitol Hill Amid Final Budget Negotiations

Seven members of the AAI Council, together with the chair of the AAI Committee on Public Affairs, visited Capitol Hill on December 11, 2014, to advocate for increased funding for the National Institutes of Health (NIH). The meetings occurred at a crucial time on Capitol Hill, just two days before Congress approved final legislation funding most government agencies and programs, including NIH, through Fiscal Year (FY) 2015. [On December 16, 2014, President Obama signed the bill into law; the law includes \$30.05 billion for NIH, an increase of \$150 million (0.5 percent) over FY 2014. For more, please see "NIH Receives Small Increase for Current Year" in the Winter 2014 edition of the AAI Newsletter.]



Pictured (L-R): Jeremy Boss, Clifford Harding, Sen. Sherrod Brown (D-OH), Linda Sherman, Mitchell Kronenberg



Pictured (L-R): Dan Littman with Morgan Brand from the office of Sen. Charles Schumer (D-NY)

The AAI leaders met with members or staff from 21 congressional offices representing seven states. They stressed that NIH has been strained in recent years due to budget cuts and inflationary erosion and that the agency needs predictable and sustained budget growth to take advantage of extraordinary scientific opportunities. They also discussed the importance of immunology research and some of the latest and most exciting scientific advances in the field.

The following AAI leaders participated in Hill Day: President Linda A. Sherman, Ph.D.; Past President Marc K. Jenkins, Ph.D.; Vice President Dan R. Littman, M.D., Ph.D.; Secretary-Treasurer Mitchell Kronenberg, Ph.D.; Councillor Arlene H. Sharpe, M.D., Ph.D.; Councillor JoAnne L. Flynn, Ph.D.; Councillor Jeremy M. Boss, Ph.D.; and Committee on Public Affairs Chair Clifford V. Harding, M.D., Ph.D. Also participating in the meetings was AAI Director of Public Policy and Government Affairs Lauren G. Gross, J.D.



Rep. Scott Peters (D-CA, 52nd) (center) with Linda Sherman and Mitchell Kronenberg



Pictured (L-R): Arlene Sharpe, Marc Jenkins, Rep. Mike Doyle (D-PA, 14th), and JoAnne Flynn

AAI Submits Comments Regarding Reagent-Related Barriers to Reproducible Research

On December 19, 2014, AAI Committee on Public Affairs Chair Clifford V. Harding, M.D., Ph.D., submitted comments to the National Institutes of Health (NIH) in response to its "Request for Information (RFI): Inviting Comments and Suggestions on the Reagent-Related Barriers to Reproducible Research." (To view the comments, visit www.aai.org > Public Affairs > Letters and Comments.)

The RFI identified reagents as a common source of variability among labs and sought to better understand the reproducibility barriers that reagents can introduce, with a focus on 1) cell culture, 2) antibodies, 3) chemicals, 4) biospecimens, and 5) other research resources. The NIH invited comments on researchers' experiences with the variability of these reagents and potential solutions or recommendations for best practices.

In his comments, Harding encouraged the NIH to keep in mind that variation is inherent to science and that understanding irreproducibility in complex processes can lead to unexpected discoveries. To address reagents specifically, Harding suggested that reagent producers provide more information about their products and publicly disclose any issues that researchers have with specific products. The comments also urged authors to include important protocol details in their Methods sections and to avoid using the citation, "as described elsewhere."

The need to increase reproducibility in preclinical research has been the subject of significant discussion within the biomedical research community. Fueled, in part, by a widely read article in *The Economist* in October 2013, the NIH announced, in a January 2014 article in *Nature*, plans to tackle this issue. NIH continues to seek community input on this issue through meetings and RFIs.

NIH to Implement New Biosketch Format

The National Institutes of Health (NIH) has developed a new biosketch format that will be used in research grant, career development, and training grant applications. The goal of this format change is to emphasize applicants' accomplishments and to shift away from the current requirement of simply listing publications. As described by NIH Deputy Director for Extramural Research Sally Rockey, Ph.D., in her *Rock Talk* blog, "The primary focus of the new NIH biosketch will be the magnitude and significance

of the scientific advances associated with a researcher's discoveries and the specific role the researcher played in those findings."

The NIH has used this format in five pilot applications. Based on the feedback from the first application, the NIH has concluded that the new format offers several advantages over the current version. Feedback from the remaining four pilot applications will be available after the new format is universally implemented. In response to concerns raised about the timing of the implementation, the NIH has extended the period for transition to the new format. Although the new format has been accepted since the January 25 application deadline, it will not be required until due dates on or after May 25.

Some in the biomedical research community continue to have concerns about the new format. FASEB recently submitted a letter to Dr. Rockey which expresses the concerns of its membership; the letter included a number of issues raised by the AAI Committee on Public Affairs. Specifically, the letter addresses concerns that 1) not enough research or feedback has been gathered to ensure that this new format is superior to the current format; 2) the new format has the potential to be highly subjective; and 3) early stage investigators may be at a disadvantage if this format is implemented.

FASEB Releases New Report on How to Sustain the Biological and Medical Research Enterprise, Seeks Input

FASEB society members and others in the biomedical research community are encouraged to comment on a recently released FASEB report on challenges facing the biological and medical research enterprise.

The report, entitled "Sustaining Discovery in Biological and Medical Sciences: A Discussion Framework," highlights a central problem of which most researchers are all too aware: "there are more highly meritorious requests for research funding than the system can accommodate." In the report, FASEB offers 31 recommendations on how research funding can be maximized, funding mechanisms can be optimized, and workforce use and training can be improved to strengthen the current system. FASEB now invites comments on these recommendations and seeks additional suggestions.

FASEB sought feedback from member societies throughout its 18-month development of the 82-page report. The AAI Committee on Public Affairs reviewed multiple drafts of the report and provided detailed input.

FOCUS ON PUBLIC AFFAIRS

FASEB also held a series of three roundtables, attended by AAI representatives, with relevant experts, including economists, government officials, and university leaders, whose input contributed to the report's wealth of supporting data.

AAI encourages all members to review the report and share their thoughts with FASEB. To review the report and/or submit comments, visit www.faseb.org/sustainingdiscovery.

U.S. Support for Medical Research Declining While Global Support Steadily Increases

A new study, published in the *Journal of the American Medical Association*, concludes that "the United States will relinquish its historical innovation lead in the next decade," unless measures are taken to increase funding (see <http://jama.jamanetwork.com/-article.aspx?articleid=2089358>). The study, authored by Hamilton Moses III, M.D., *et al.*, shows that the rate of U.S. investment in medical research, both public and private, has been steadily decreasing over the last decade.

The authors found that overall funding for biomedical and health services research in the United States increased at a rate of 6 percent per year from 1994 to 2004. However, from 2004 to 2012, the rate of growth decreased significantly to just 0.8 percent per year. In real dollars (adjusted for inflation), overall biomedical research funding in the United States actually decreased in three of the last five years.

The authors also found that international expenditures on medical research have been steadily increasing. In fact, of the seven regions analyzed in the paper, "the United States demonstrated the slowest annual growth in investment (1.5 percent/year)," from 2004 to 2011. During this same time frame, the Chinese growth rate was 16.9 percent per year, and the growth rate in the region that includes India, Singapore, and South Korea was 20.8 percent per year. Even though the United States has historically generated more than one-half of the world's funding for biomedical research, the authors caution that "new investment is required if the clinical value of past scientific discoveries and opportunities to improve care are to be fully realized."



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Members in the News

Gail Bishop is Leukocyte Biology Society Awardee

Gail A. Bishop, Ph.D., AAI '84, who served from 2012 to 2013 as the 96th AAI president, has been named the 2015 recipient of the Bonazinga Award, presented annually by the Society for Leukocyte Biology (SLB) in recognition of a society member's excellence in leukocyte biology research. The highest honor bestowed by the



Gail A. Bishop

SLB, the award conveys a \$3,000 prize provided by Accurate Chemical and Scientific Corporation, along with the distinction of presenting the keynote lecture at the SLB annual meeting.

Dr. Bishop is a professor in the Department of Microbiology at the University of Iowa (UI) College of Medicine, where she directs the UI

Center for Immunology and Immune-Mediated Diseases and serves as associate director for basic science research at the university's Holden Comprehensive Cancer Center. She holds a secondary appointment in the Department of Internal Medicine (Division of Immunology) and has served since 1993 as a faculty member of the interdisciplinary graduate programs in immunology and in cellular/molecular biology, the former of which she directed from 1998 to 2013.

Bishop's research explores molecular mechanisms of lymphocyte activation and tolerance, focusing particularly on the TNF receptor superfamily (TNFRSF) molecules and the TNFR-associated factor (TRAF) cytoplasmic adaptor molecules to better understand how normal immunity, autoimmunity, and malignancy are regulated. The Bishop lab has examined how the TNFRSF member CD40 regulates signaling to B lymphocytes and how the Epstein-Barr virus-encoded viral mimic of CD40, latent membrane protein 1 (LMP1), signals through the same TRAF molecules as CD40 but in very distinct ways. These studies will promote understanding of the mechanistic basis of LMP1 involvement in B cell lymphoma and autoimmunity. The lab also studies the cell type-specific functions of TRAF3, currently focusing on the roles of TRAF3 in B cell survival and T cell signaling and function. Additionally, Bishop's group investigates how different TNFRSF molecules interact

with one another to regulate lymphocyte activation and apoptosis and how innate and adaptive receptor signals interact to affect B cell activation. The long-term goal of many of these studies is their application to better adjuvant design for the future development of safe, effective vaccines. To this end, studies are currently underway to optimize B cell vaccination in a melanoma tumor model. Finally, Bishop is analyzing how CD40 regulates the intestinal microbiota and protects against diet-induced obesity in a mouse model.

An AAI Council member from 2007 to 2014, Bishop previously served as a member of the AAI Finance Committee and the AAI Committee on Public Affairs and as AAI representative to the Federation of American Societies for Experimental Biology (FASEB) Science Policy Committee. She has served on the faculty of the AAI Introductory Course in Immunology and as an associate editor and section editor for *The Journal of Immunology*.

Bishop has held numerous NIH study section and review panel appointments and served on additional review and advisory panels for the National Science Foundation, U.S. Department of Veterans Affairs (VA), American Heart Association, American Association for the Advancement of Science Council (delegate), University of Michigan Life Sciences Institute, BloodCenter of Wisconsin, St. Olaf College, and the Singapore government (U.S. representative to international immunology grant review panel). She chairs the FASEB Ad Hoc Subcommittee on Peer Review and serves on the National Cancer Institute-Frederick Scientific Advisory Committee.

Bishop is a member of the editorial boards of *The Journal of Leukocyte Biology* and *Self/Non-self* and serves on the *Signal Transduction—Receptors, Mediators and Genes* advisory board. She has served as an ad hoc reviewer for numerous journals, including the *American Journal of Pathology*, *American Journal of Physiology*, *Biotechniques*, *Cancer Research*, *Cellular Immunology*, *Clinical and Experimental Immunology*, *European Journal of Immunology*, *Immunology Letters*, *Immunity*, *International Immunology*, *Journal of Biological Chemistry*, *Journal of Experimental Medicine*, *Journal of Virology*, *Nature Immunology*, *PNAS*, *Transplantation*, and *Virology*.

In 2014, Bishop was the first recipient of the Juneann Murphy Distinguished Women in Science Lectureship at the University of Oklahoma College of Medicine. Her additional career honors and appointments include: Iowa Technology Association's Woman of Innovation Award; chair and Leadership Award recipient, Autumn Immunology Conference; Carver Research Program of

Excellence Award; invited commencement speaker, UI Graduate College; UI Graduate College Outstanding Mentor Award; Donald D. Dorfman Research Award for best cancer-related scientific paper, Holden Cancer Center; UI College of Medicine Distinguished Professor of Microbiology (endowed professorship); Carver Foundation Fellowship, UI; National Arthritis Foundation Investigator Award; Damon Runyon- Walter Winchel Cancer Fund Postdoctoral Fellowship; Lineberger Cancer Research Center Postdoctoral Fellowship, University of North Carolina, Chapel Hill; Horace H. Rackham Predoctoral Fellowship, University of Michigan; NIH Predoctoral Trainee, University of Michigan; NIH Predoctoral Trainee, University of Wisconsin; Winter Research Laboratory Undergraduate Fellowship; Milwaukee Jaycees Scholarship Award; and Milwaukee Transport Company Scholarship Award.

Bishop received her B.A. (biology) from St. Olaf College, M.S. (oncology) from the University of Wisconsin, and Ph.D. (cellular and molecular biology) from the University of Michigan, where she was mentored by Joseph Glorioso and Stanley Schwartz. She trained as a postdoctoral fellow with Geoffrey Houghton and later with Jeffrey Frelinger at the University of North Carolina, Chapel Hill, where she was subsequently appointed research assistant professor.

Bishop joined the UI College of Medicine faculty in 1989 as an assistant professor in the Department of Microbiology, later adding a parallel appointment in the Department of Internal Medicine, Division of Rheumatology. In 1994, she was appointed associate professor and has served as a full professor since 1998. In addition to serving as professor of microbiology and of internal medicine, Bishop's current appointments include endowed College of Medicine Distinguished Professor of Microbiology (since 2001), Holden Chair of Cancer Biology (2004), and associate director for basic science research at the Holden Comprehensive Cancer Center (2004). Since 2012, she has served as director of the UI Center for Immunology and Immune-Based Diseases, a member of the university's Medical Scientist Training Program faculty, and a research health science specialist at the Iowa City VA Health Care System, where she holds the status of senior research career scientist.

Rita Effros Assumes Gerontological Society Leadership

Rita B. Effros, Ph.D., AAI '80, was recently installed as the 71st president of The Gerontological Society of America (GSA). She was elected by the society's interdisciplinary membership of more than 5,500 researchers, educators, practitioners, and other



Rita B. Effros

professionals devoted to the field of aging. As GSA president, she will oversee matters of governance and strategic planning while managing the program for GSA's 2015 Annual Scientific Meeting.

Dr. Effros is a professor of pathology and laboratory medicine within the David Geffen School of Medicine of the University of California, Los Angeles (UCLA). Her research

focuses on immune system changes associated with human aging and their impact on infections and cancer. Throughout her career, Effros has investigated the immune response to viruses, with a special emphasis on telomeres, the regions at the ends of chromosomes that shorten during cell division. Her laboratory discovered that during aging and HIV infection, both of which are characterized by the loss of immune control over viral infections and by increased cancer incidence, many immune cells have critically short telomeres. Effros and her group have studied the involvement of replicative senescence, telomeres, and telomerase in human T cell dysfunction, which may contribute to multiple pathologies of aging and AIDS. They are also working on developing approaches to therapeutically reverse or retard the process of replicative senescence in human T cells through manipulation of telomerase activity. The pioneering work of Effros and others in documenting similarities between age-related immune alterations and those associated with HIV/AIDS has taken on increasing importance with the prolonged survival of HIV-infected persons.

AAI Newsletter: Members in the News—Submissions Invited

AAI welcomes the opportunity to highlight the career achievements and professional honors attained by AAI member scientists. Such publicity not only serves to inspire colleagues but also informs the broader public of immunology's vital and widening role in scientific discovery and transformative medicine.

Help AAI share news of your or another member's noteworthy scientific and/or service recognition or career appointments by contacting mwucuddy@aai.org. Thank you!

Members in the News (continued)

An ad hoc reviewer for *The Journal of Immunology*, Effros has served on the editorial boards of *Experimental Gerontology*, *Mechanisms of Aging & Development*, *Current HIV Research*, *Current Gerontology and Geriatrics Research*, *Aging: Clinical & Experimental Research*, and *The ScientificWorld*. Recently guest editor of a special issue on aging and cancer for *Critical Reviews in Oncogenesis*, Effros has served as a reviewer for *Nature Immunology*, *Blood*, *Journal of Clinical Investigation*, *Trends in Immunology*, *AIDS*, *Cellular Immunology*, *Clinical Immunology*, *Human Immunology*, *Immunology Letters*, *Journal of Gerontology*, *Experimental Gerontology*, *Mechanisms of Aging and Development*, *Arthritis & Rheumatism*, *Cancer Research*, and *International Journal of Obesity*.

Effros has served on multiple NIH study sections and on review panels for entities that include the American Federation for Aging Research (AFAR), 1st and 2nd HIV and Aging Workshops (Baltimore, MD), Rush Center of Excellence on Disparities in HIV and Aging, GSA Public Policy Committee, GSA Biological Science Fellowship Selection Committee, and the government of Austria (international site visit team, Program Project on Aging). An elected fellow of GSA and recipient of GSA's Robert W. Kleemeier Award, Effros held the Thomas and Elizabeth Plott Endowed Chair in Gerontology at UCLA. Her additional career honors and appointments include: Faculty of 1000 (HIV infection and AIDS section); Walford Biology of Aging Endowed Lectureship, UCLA; Merck-American Association for the Advancement of Science Lecturer, Pomona College; chair, Biological Science Section, GSA; Visiting Scholar, University of Pennsylvania Institute on Aging; Dorothy Dillon Eweson Endowed Lectureship, AFAR; UCLA Woman of Science Award; NIH Research Career Development Award; Sandoz Foundation Award for Gerontologic Research; NIH New Investigator Research Award (FIRST Award); NIH Postdoctoral Fellowship; Multiple Sclerosis Society Postdoctoral Fellowship; NIH Predoctoral Fellowship; and Brandeis National Scholar award.

A biology graduate of Brandeis University, Effros received her Ph.D. in immunology, focusing on influenza immunity, from the University of Pennsylvania, under the mentorship of Peter Doherty. She undertook postdoctoral training in the Doherty lab at the Wistar Institute and subsequently as an NIH postdoctoral fellow in the Department of Microbiology & Immunology at the UCLA School of Medicine, where she subsequently served as an assistant research pathologist. In 1984, she was appointed assistant professor of pathology; she was appointed associate professor in 1986 and has

served as a full professor in the Department of Pathology and Laboratory Medicine since 1992. She is a member of UCLA's Molecular Biology Institute and Jonsson Comprehensive Cancer Center and serves as co-director of the Aging and HIV Program Area of the UCLA AIDS Institute. Her additional UCLA appointments have included service as co-director of the Human Tissue Research Center and of the Cellular and Molecular Pathology Graduate Program.

In addition to mentoring graduate students, Effros has been a major force in UCLA undergraduate education in gerontology, where she helped establish and still teaches a freshman year-long interdisciplinary course, "The Longevity Revolution: Biomedical, Social and Policy Perspectives." She has made multiple media appearances on topics related to aging and telomeres, including on NPR and PBS's Scientific American Frontiers program, and in documentaries on PBS and the Canadian Discovery Channel.



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Important Dates for Two AAI Awards Programs

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

AAI Careers in Immunology Fellowship

KEY DATES	APPLICATIONS OPEN	APPLICATIONS CLOSE
	JANUARY 15	MARCH 16

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

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

Direct inquiries to fellowships@aai.org.

AAI Travel for Techniques Award Program

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

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

Direct inquiries to tft@aai.org.

These two exciting awards programs were launched by the American Association of Immunologists in 2014, adding significantly to its already robust support for scientists through fellowships, career awards, and travel grants. For more information, visit www.aai.org/awards.

Michael Bennett, M.D., AAI '75

1936 – 2015

AAI extends condolences to the family, friends, and colleagues of Michael Bennett, M.D., who died on January 25 following an extended illness. An AAI member since 1975 and a past associate editor for The Journal of Immunology, Dr. Bennett was a pathology professor at the University of Texas Southwestern Medical Center in Dallas. The following remembrance was authored by University of California professor William J. Murphy, Ph.D., AAI '93, who was among Dr. Bennett's trainees and long-time collaborators. AAI gratefully acknowledges the submission.



Michael Bennett

The transplantation, pathology, and immunology communities lost a pioneer with the recent passing in Texas of Michael Bennett, M.D. Mike was loved and respected as an exemplary mentor, scientist, and friend. More than a few colleagues regarded him as “the nicest person in science” for his unfailingly cheerful and optimistic manner—a quality not necessarily universal among scientists. Every experiment, according to Mike’s outlook, yielded data he could draw something from; he had a knack for discerning the deeper meaning suggested by even the most preliminary finding. The joy of science and medicine was always evident with him, including through his willingness to share his knowledge and his data alike. He will be sorely missed.

Mike received his M.D. at Baylor in 1971, after which he completed a residency in pathology. Given his insatiable curiosity about the science of life, pathology proved an excellent foil as it was all-encompassing in its involvement of biological systems. Mike subsequently did a post-doctoral fellowship at Oak Ridge National Laboratories in Tennessee with Gustavo Cudkowicz, who was examining bone marrow allograft rejection in mice.

Few now remember that the field of hematopoietic stem cell transplantation (HSCT) was actually born from military interests in stem cell rescue following radiation exposure. At Oak Ridge, Mike observed that lethally irradiated and unsensitized mice could reject bone marrow cell allografts. Further, he observed that the rejection capability did not follow the classical laws of transplantation in that the F1 hybrid mice could reject parent bone marrow cells but not solid tissue allografts. In a landmark paper in 1971, Mike termed this phenomenon “hybrid resistance.” The enigmatic cell type responsible was radioresistant, marrow dependent (he originally

called these cells “M cells” following landmark studies using the bone-seeking isotope Strontium), and later found to be what we now call natural killer (NK) cells (not characterized until years later). He postulated that recessively expressed determinants called “hematopoietic histocompatibility,” or Hh antigens, were expressed on parental but not F1 hybrid bone marrow cells.

Characterizing these Hh antigens became the goal of many projects—and Mike offered a free trip to the Bahamas for the student optimizing the *in vitro* assay to detect them. While the work ultimately fell short of achieving that objective (no one won the trip!), it resulted in many more important findings. He went on to devote most of his career to understanding the biology and mechanisms underlying the immunogenetics of bone marrow rejection, as well as the cell types involved.

After a stint at Roswell Park Memorial Institute, Mike went to Boston University as a professor in pathology under the tutelage of Stanley Robbins, author of the most commonly used pathology text. It was there that Mike struck up a partnership with his post-doctoral fellow, Vinay Kumar, who would become a lifelong friend and collaborator of many decades.

In 1981, Mike and Vinay moved to the pathology department at the University of Texas Southwestern Medical Center. The department was home to a great group of immunologists, including Dorothy Yuan (with whom Mike car-pooled every day), Mary Lipscomb, and others who met together regularly. Mike went on to become the A.J. Gill Professor in Pathology before his retirement in 2012 due to the effects of a long illness.

Mike’s contributions to science and medicine are enormous. He was a leader in NK cell biology and was internationally known for his vast and almost unlimited knowledge of mouse immunogenetics and mouse modeling. (His NIH grants were about the most dense I have ever read! Members of study section would groan when given one.) Few if any could match his command of the different mouse strains and recombinant inbred variations and their characteristics. He looked at immunobiology at a systems level and examined NK cell function using almost every available model—tumors, viruses, fungal, even bacterial. He worked on graft-versus-host disease (GVHD) as well as other issues in HSCT, and

collaborated extensively. He had over 250 publications. It was Mike and Vinay's work on NK cell subsets in bone marrow rejection that led to the understanding of how hybrid resistance could occur as well as NK cell subset licensing. What we know of NK cells and the potential for therapeutic use in cancer and in HSCT is in large part due to his earlier seminal discoveries.

Mike was very active in the science community, including as an editor for *The Journal of Immunology* (associate editor, 1983-1987), *Experimental Hematology* (1972-1975), *Cancer Research* (1985-1989), and other journals. He was active in multiple scientific societies and served as a member of NIH study sections. On one occasion, a scientific review administrator confided that Mike, despite his incredible knowledge, was not considered a great study section reviewer because he saw the positives in every grant application! That illustrates the incredible attitude this man had about science and the people who carry it out.

I am among the numerous students and postdocs Mike mentored over the years—and count myself among those who are successful today largely due to his mentorship. As an immunology graduate student at UT Southwestern from 1984-1989, I was a part of the graduate student-run lab that Mike and Vinay shared. The Bennett/Kumar lab would be working day and night, often in shifts. The energy and enthusiasm were palpable. Mike always had an idea or suggestion and always, always was supportive. Graduate students giving a works-in-progress seminar (a stressful experience) knew it was something to be welcomed when Mike raised his hand with a comment or question, as his input was invariably complimentary. He made it a point to go to every seminar—a commitment not lost on his students. Mike also would fight for what he believed to be right. I will never forget when I was close to being dismissed from the graduate program for sub-par academic performance (I found lab work much more gratifying), but Mike threatened to resign from the program if I were released.

I owe him more than my career. He was a role model as a human being. He believed in the pure joy of science and not the petty politics often associated with it. Ego was not an issue with him. We would have coffee every day and talk about anything—sometimes history (particularly the history of medicine) or politics (Mike was an unabashed liberal Texan), but usually experiments, about which we would trade notations on napkins or scraps of paper. Mike LOVED being an experimentalist and being in the lab. How often we watched with amazement as he would think

of an experiment (sometimes outrageous) and perform it himself, then catch ourselves shuddering as he could also be very absent-minded and leave us to stumble upon things left by him.

As immunology graduate students, we tended to focus solely on immunology, but Mike believed everything was connected. He would talk about any medical condition and how it could be linked with immunology. In that regard, he was a dying breed of researcher: ever mindful of the big picture, yet capable of being extremely productive in solving problems.

Following my departure from UT Southwestern for the NCI, I spoke with Mike constantly. He introduced me to Bruce Blazar, initiating our long friendship and collaboration in GVHD. Mike's own gift for collaboration was exemplified in his work with Bruce and their publication of a key paper in 1998 demonstrating the critical role of mouse colonies in affecting NK cell-mediated bone marrow rejection. Using the same mice but working independently in different labs, they had obtained opposite results. Rather than publishing the contrary findings separately, Mike and Bruce opted to work together and found a fascinating connection (likely related to microbiome differences) that reconciled their data.

Mike's fun side was demonstrated by his interests outside of work, which included joining the student softball team in Texas. Mike served as best man at my wedding and as godfather to one of my children.

Mike and I continued to collaborate for many years. Not long ago, when I was an outside committee member for one of Robert Levy's graduate students in Florida, Robert showed me a cell-like "lineage" map of current HSCT researchers. Originating with Cudkowicz, it split to Mike Bennett and Gene Shearer (who worked together in Cudkowicz's lab, with Gene focusing more on GVHD), then to myself and Robert as their students, then to our students as further progenitors-to-be. It is a solid lineage and one of which I am very proud to be a part.

A notable demonstration of the admiration and gratitude Mike inspired was the establishment of the Michael Bennett Lectureship in Pathology at UT Southwestern through the efforts of his friend and colleague, Vinay. Another was the very heartwarming and bittersweet gathering to celebrate his career several years ago when his illness hampered his ability to do the science he so loved. Former students (including many who were not "officially" mentored by Mike but nevertheless viewed

him in those terms) flew in from all over the country to salute him. The occasion was a fitting illustration of how students and mentors like Mike become like family despite the relatively short time spent together. Witnessing his illness and its encroachment on his days as an active scientist, I think all of us who had been his students experienced a tremendous desire to help, together with a deep frustration born of contending with the prospect that no substantive resolution was ultimately feasible.

Mike is survived by his devoted wife of 54 years, Mary (who, toward the end of Mike's career, often assisted him in the lab to help enable the continued performance of ongoing experiments.) Other survivors include their four children (Byron, Marc, Danny, and Heather), seven grandchildren, one great granddaughter, and many nieces and nephews.

I can only say that I sincerely hope I can be half the scientist and mentor Mike was.

GRIP

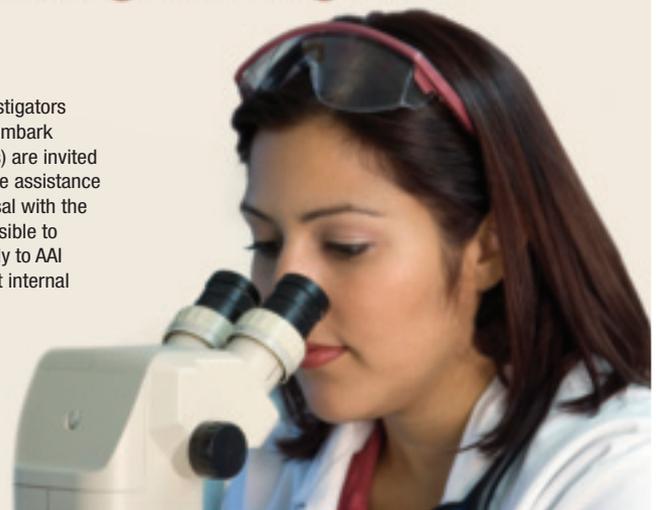
Grant Review for Immunologists Program

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AAI Outreach Program Update

In its commitment to promoting the career development of promising young scientists, AAI was pleased to provide award and session sponsorship at the recent New England Immunology Conference and Autumn Immunology Conference.



AAI members Peter Savage (AAI '11) and Deborah Fowell (AAI '01) having a snack break with "Foxp3"

New England Immunology Conference (NEIC)

The 40th Annual NEIC was held November 1–2, 2014, at the Marine Biological Laboratory in Woods Hole, Massachusetts.

The conference was organized by Mark Exley (AAI '02) and Thorsten Mempel (AAI '07) and featured sessions, including the cleverly titled topic, "Forty years and what do you get? Age, chronic disease, and diminished immunity," chaired by AAI members Mempel, Henry Wortis (AAI '82), Terry Strom (AAI '75), and Joe Craft (AAI '93). The program also featured a poster session presentation competition that was attended by trainees imaginatively costumed as "Foxp3."

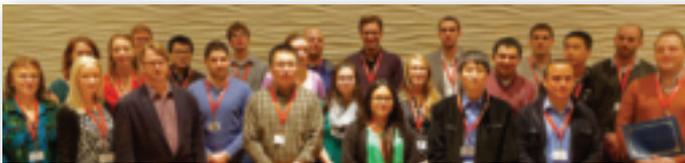
For the fourth year at NEIC, AAI sponsored AAI Janeway Awards, named in honor of the late Charles A. Janeway (AAI '74), AAI president from 1997 to 1998. Six early-career scientists received awards: Michael Cooney, Genocea Biosciences, Inc.; Courtney Anderson, Brown University; Sandhya Pulivarthy, Massachusetts General Hospital; Jia Yao Phuah, University of Massachusetts Medical School; James Akin, Harvard Medical School; and Palmira Barreira-Silva, University of Minho, Portugal, and University of Massachusetts Medical School.



Thorsten Mempel (far left) and Mark Exley (far right) with NEIC awardees (L–R) James Akin, Palmira Barreira-Silva, Michael Cooney, Sandhya Pulivarthy, and Jia Yao Phuah

Autumn Immunology Conference (AIC)

Over 600 scientists attended the 43rd Annual AIC, held November 21–24, 2014, in Chicago. Conference Chair Thomas Mitchell (AAI '01) presided over the meeting. Session topics ranged from the influence of metabolism on immunity to immunostimulation.



The 2015 AAI Young Investigator Awardees together with AAI staff and AIC meeting organizers

AAI, for the fourth year, provided 19 awards in support of the career development of trainees. Presenting the awards were Virginia Shapiro (AAI '04), AIC awards coordinator, assisted by Elizabeth Walsh, AAI science liaison. Recipients of the AAI Young Investigator Award were Jaclyn McAlees (Cincinnati Children's Hospital); Sebastian Carrasco (Indiana University); Rachael Philips and Adam Scheid (Mayo Clinic); Kathryn Pothoven and Jeffrey Liu (Northwestern University); Jonathan Kurtz (Tulane University); Erin Zook and Douglas Kline (University of Chicago); Jared Klarquist (University of Cincinnati); Nurbek Mambetsariev, Zuoan Yi, and Aldo Vacaflores (University of Iowa); Grant Jones (University

of Kentucky); Zachary Benet, Xiaofeng Zhou, Stephen Gurczynski, and Raquel Domingo-Gonzalez (University of Michigan); and Haiguang Wang (University of Minnesota).

AAI also continued its sponsorship of the Careers in Immunology Undergraduate Workshop, directed by Heather A. Bruns (AAI '05). This annual workshop provides opportunities for undergraduate students involved in or interested in research to learn about scientific career opportunities in immunology. The panel this year featured Calvin Williams (AAI '01) from the Medical College of Wisconsin; John Hackett from Abbott Laboratories; Charlotte Vines from the University of Texas, El Paso; Michael Farrar from the University of Minnesota (AAI '00); and Aldo Vacaflores Salinas (AAI '14), a graduate student at the University of Iowa. The panelists answered questions ranging from how to get into a graduate program after being out of school for many years to whether joint M.D.–Ph.D. programs are necessary training for physician scientists. After the workshop, graduate program representatives met with students to provide them with additional information about the field of immunology.

AAI staff hosted a booth in the exhibit and poster hall. There, Walsh, along with Jennifer Woods, membership manager, and Dave Jackson, director of finance, provided AIC attendees with information about AAI programs that could benefit their careers and research.



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Industry Representation in Early AAI

The American Association of Immunologists (AAI) benefits now, as at its founding, from the participation and contributions of researchers in academia, government, and industry. Although AAI members throughout the association's 102-year history have been based largely in academia, a smaller, but significant, portion of members has worked in government and industry. All three member segments have provided leadership and vision shaping the association of today. In this article, AAI reflects upon the vital contributions of industry members in the organization's first three decades—1913–1943.

These early members were scientists from for-profit, commercial institutions with research laboratories. Some worked in establishments for the medical treatment of people convalescing from a chronic illness and others were employed by pharmaceutical companies.

Of the original 52 AAI charter members in 1913, nine were employed by sanatoria or pharmaceutical companies, including Cragmor Sanatorium, H. K. Mulford Company, and Parke-Davis and Company. By 1943, at least 21 of the then 310 active members had spent at least some of their careers in industry at such companies as Lederle Laboratories, E. R. Squibb & Sons, and Eli Lilly & Company, to name a few.¹



Tuberculosis camp in Ottawa, Illinois, ca. 1908

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Sanatorium Movement and AAI

In the nineteenth century, tuberculosis remained a leading cause of death in industrialized countries. The disease was, in fact, the leading cause of death in the United States, accounting for one out of every five deaths in the country from 1800–1870. The

disease afflicted young and old, men and women, urban and rural, and rich and poor.²

The German response to this centuries old scourge was to establish sanatoria predicated upon the importance of “fresh air, rest, good food, and regulated exercise.”³ The first was a private facility was opened by Hermann Brehmer in 1854 in the mountains of Silesia. Because some patients enjoyed dramatic improvement in this setting, the German government funded a number of public sanatoria (Volkshelilstätten) in the 1870s.⁴ The ranks of public sanatoria quickly swelled as disability insurance funds became available to fund treatment for most tuberculosis.⁵



Sanatorium in Lysin, Switzerland, ca. 1890

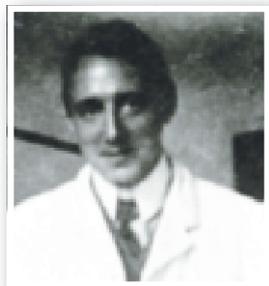
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The emerging U.S. public health movement, coupled with the growing progressive reform movements of the late nineteenth century made the United States fertile ground for sanatoria.⁶ Following New York physician Edward L. Trudeau's opening of his Saranac Lake facility in 1884, a number of U.S. sanatoria were established, albeit with little consensus on effective therapies.⁷ The

1. When the AAI Constitution and Bylaws was adopted in 1917, the only membership category was “Active.” In 1935, an Honorary membership category was created. It was very similar to the current AAI Emeritus member classification.
2. Sheila M. Rothman, *Living in the Shadow of Death: Tuberculosis and the Social Experience of Illness in American History* (Baltimore: The Johns Hopkins Press, 1995), 2.
3. Alan. Kraut, “Plagues and Prejudice,” in *Hives of Sickness: Public Health and Epidemics in New York City*, ed. David Rosner (New Brunswick, NJ: Rutgers University Press, 1995), 77.
4. For more information on the first sanatoria in Germany, see Peter Warren, “The Evolution of the Sanatorium: The First Half-Century, 1854-1904,” *Canadian Bulletin of Medical History* 23, no. 2 (2006): 457–76; Volkshelilstätten (“sanatoria for the people”) were also known as Arbeiterheilstätten (“sanatoria for the workers”).
5. Larry Frohman, “Association Prevention, Welfare, and Citizenship: The War on Tuberculosis and Infant Mortality in Germany, 1900–1930,” *Central European History* 39, no. 3 (2006): 441.
6. The terms “sanitarium” and “sanatorium” were used nearly interchangeably in the late nineteenth and early twentieth centuries. The small distinction between the two terms is that sanitariums were generally considered more health retreats/resorts, whereas sanatoria carried more of a hospital connotation. We are using “sanatorium” except when the proper names of an institution dictate the use of sanitarium.
7. Kraut, *Hives of Sickness*, 77.

U.S. sanatoria evolved as three types based on three different funding models: public facilities owned and operated by local or state municipalities; privately funded, non-profit facilities with costs of patient care supported by charitable organizations such as workers' unions or immigrant groups; and private, for-profit institutions to serve the wealthy who could afford to finance their own cutting-edge care.⁸ These sanatoria for the wealthy were among the first to have laboratories,

although by the 1910s, most public sanatoria, Catawba Sanatorium in Virginia, for example, included at least a basic laboratory for research.



Gerald B. Webb, 1906

The American Association of Immunologists Collection, Center for Biological Sciences Archive, UMBC

Two eminent tuberculosis researchers were among the early AAI members associated with private, for-profit tuberculosis sanatoria: the first president of AAI, Gerald B. Webb (AAI '13, president 1913–1915), and Karl von Ruck (AAI '13). Webb lent his national

renown as a tuberculosis physician and researcher to the emergence of Colorado Springs as a center for tuberculosis research and sanatoria.⁹ Having also helped craft the initial scope and membership of the association during the founding meetings, Webb became its first president.¹⁰

Karl von Ruck was founder of the Winyah Sanatorium (1888) and the von Ruck Research Laboratory for Tuberculosis (1895) in Asheville, North Carolina. With both of these institutions playing important roles in establishing that city as a haven for convalescence, the laboratory became a magnet for early-career researchers. Among others there, Jules Freund (AAI '24, president 1955–56) and Louis Dienes (AAI '24), became AAI members soon after their arrival at the von Ruck Laboratory. Both published their clinical and laboratory tuberculosis research in *The Journal of Immunology* (*The JI*).

Other sanatoria-based researchers among early AAI members included Amelia L. Gates (AAI '13), Gates Sanitarium in San Jose, California; Francis M. Pottenger,



Winyah Sanitarium, Asheville, North Carolina

North Carolina Collection Photographic Archives, University of North Carolina at Chapel Hill

Sr. (AAI '13), Pottenger Sanatorium for Diseases of the Lungs and Throat in Monrovia, California; G. Burton Gilbert (AAI '13), Laboratory of the Cragmor Sanatorium, in Colorado Springs; and Silvo von Ruck (AAI '13), Winyah Sanatorium in Asheville, North Carolina.¹¹

Although Webb, as AAI president, held the highest office on the AAI masthead, many sanatoria scientists actively participated in annual meetings, nominated potential new members, and published much of their research in *The Journal of Immunology*, making *The JI* one of the leading repositories of literature on the understanding and treatment of tuberculosis, until the introduction of streptomycin and isonicotinic hydrazide brought the disease under control following the Second World War.¹²

Biologics in Early Pharma

In the early twentieth century, the pharmaceutical industry was undergoing a phase of rapid expansion that coincided with the growth in biologics—and with the founding of AAI. Growth of the largest drug industry trade association provides a useful index to the growth in pharma. That group, the American Drug Manufacturers' Association, was founded in 1912 with 29 companies, but within 10 years, the membership had expanded to 54 companies.¹³

Continued, page 19

8. *Ibid.*, 77–78. For more information on the German sanatoria system, see Frohman, "Association Prevention, Welfare, and Citizenship," 431–81.

9. For information on how Webb helped Colorado Springs emerge as a center for tuberculosis research and sanatoria, see Helen Clapesattle, *Dr. Webb of Colorado Springs* (Boulder, CO: Colorado Associated University Press, 1984).

10. See "The Founding of AAI," AAI Newsletter (May/June 2012), 24–29.

11. The Gates Sanitarium, founded by Amelia Gates and her husband Howard, was in operation from 1898 through the early twentieth century. The Pottenger Sanatorium for Diseases of the Lungs and Throat, founded by Francis M. Pottenger, Sr. (1869–1961), was in operation from 1903 to 1955. Cragmor Sanatorium, today part of the University of Colorado at Colorado Springs, was founded by Edwin Solly and in operation from 1905 to 1962.

12. Kraut, *Hives of Sickness*, 77.

13. National Association of Manufacturers of Medicinal Products, *Proceedings of the First Annual Meeting*, February 6–7, 1912 (1913), 4; American Drug Manufacturers' Association, *Proceedings of Tenth Annual Meeting*, April 11–14, 1921 (1922), 372–3.

Karl von Ruck: A biographical sketch

Karl von Ruck (AAI '13) was one of the early pioneers of the sanatorium movement in the U.S. Although the movement took many forms, von Ruck was one of the first to build an influential research laboratory alongside his sanatorium to enhance the understanding and treatment of tuberculosis. Born in Istanbul in 1849 to a German diplomat, Karl von Ruck studied under Felix von Niemeyer and graduated with a degree of doctor of medicine from the University of Tübingen in 1877, and, after immigrating to the United States, earned an M.D. from the University of Michigan in 1879. Von Ruck returned to Europe for his post graduate studies, where he conducted research in the laboratories of Rudolf Virchow and Robert Koch—and was present when Koch presented his discovery of the tubercle bacillus on March 14, 1882 at the meeting of the Berlin Physiological Society.¹ After returning to the States, von Ruck spent a few years in private practice in Ohio before focusing exclusively on tuberculosis research. Seeking a more favorable location to conduct research, he decided on Asheville, North Carolina,² in the Blue Ridge Mountains.

In 1888 he established Winyah Sanitarium, one of the first private tuberculosis treatment



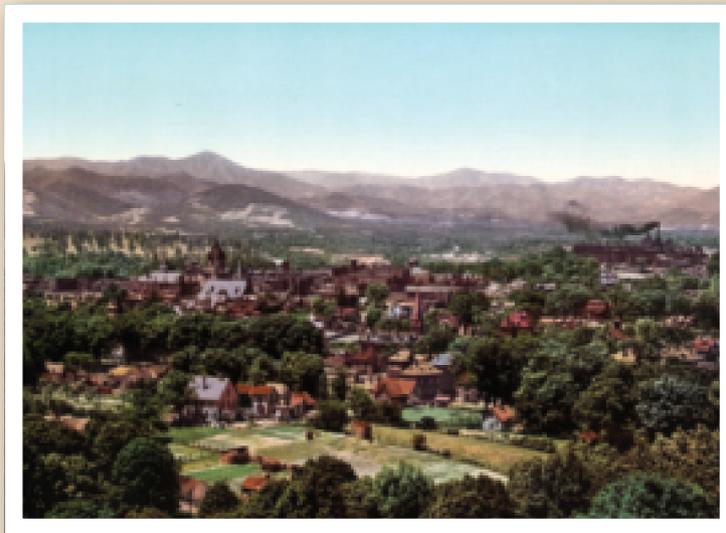
Karl von Ruck
North Carolina Collection, Buncombe County
Public Libraries

institutions in the United States.³ At Winyah, which was closely modeled on German sanatoria, von Ruck believed he could develop a biological means for controlling the disease, including possible immunization. In order to conduct more laboratory research, he established the von Ruck Research Laboratory for Tuberculosis in 1895 on the grounds of Winyah and, in 1910, promoted his son, Silvio von Ruck (AAI '13), to medical director of the hospital thereby freeing his days to focus on research. It was in his laboratory that Karl von Ruck and his colleagues advanced tuberculosis treatment by introducing “the watery extract of tubercle bacilli, a modification of Koch’s fist tuberculin,” and developing a serum “consisting of a protein and lipid extractions of tubercle bacilli

which was used in treatment and with which he hoped to immunize children.”⁴ Patients came from across the country for treatment, including U.S. Senator John W. Kern (D-IN). In addition to creating a pioneering research laboratory, von Ruck founded and co-edited *The Journal of Tuberculosis* with

Silvio and helped establish Asheville as a national center for the treatment of tuberculosis and other respiratory diseases.⁵

Karl von Ruck died in Asheville on November 5, 1922, of complications from chronic nephritis and hypertension.⁶ Both Winyah and the von Ruck Laboratory continued to operate for a number of years after his death,⁷ contributing to his influence in the rapid growth of sanatoria in North Carolina and elsewhere in the South.



Asheville, North Carolina
Library of Congress, Prints and Photographs Division, Detroit Publishing Company Collection

1. Edward W. Shoenheit, “Asheville’s Pioneers: Karl von Ruck, M.D., 1849–1918,” *Chest* 3, no. 6 (1937): 6.
2. In the late nineteenth through early twentieth century, Asheville became a major destination for convalescing patients. It was believed that the clean mountain air, altitude, and temperate climate had healing properties. The first privately operated tuberculosis sanatorium opened in Asheville in 1871.
3. “Dr. Carl von Ruck Dies,” *New York Times*, November 7, 1922.
4. Shoenheit, 6; In 1913 the von Rucks unsuccessfully campaigned to have the Public Health Service verify what they maintained was a serum for treating tuberculosis. See “Biographical Note,” Karl and Silvio von Ruck Papers 1907–1915, National Library of Medicine, Bethesda, MD
5. Shoenheit, 24; *The Journal of Tuberculosis* was published from 1899 to 1903 in Asheville, N.C.
6. Shoenheit, 24.
7. The closing dates for Winyah Sanitarium and the von Ruck Laboratory could not be determined.

Continued from page 17

At the time AAI was founded, the expansion of pharmaceuticals was driven by three major currents from the late nineteenth century: the invention of the tableting machine, standardization of drugs by chemical assay, and the first successful use of diphtheria antitoxin and subsequent growth of biologics. Tableting machines ushered in mass production of medications. The use of chemical assays in laboratory testing enabled companies to verify their claims of drug purity.¹⁴ Third, Emil von Behring's discovery of a successful diphtheria antitoxin in 1890 triggered drug manufacturers to enter biologics. Doing so required companies to construct commercial biological laboratories, prompting them either to hire highly trained researchers or associate with a trusted academic or medical institution to guarantee the quality of their products.

As is the practice today, biomedical researchers moved frequently between academia and the pharmaceutical industry. Scientists commonly split their time equally between positions in industry and academia. Because little data exist on early AAI members' institutional affiliations, it is difficult to determine the length of time an AAI member spent in a particular company. We do, however, know that AAI members who enjoyed some affiliation with the pharmaceutical industry during their careers made contributions, large and small, to shape the association during its formative years.¹⁵



Extraction of diphtheria serum from horse blood, Marburg, Germany, ca. 1895

Images from the History of Medicine, National Library of Medicine

Hygienic Laboratory of the United States Public Service (redesignated the National Institutes of Health in 1930), director of the Research and Biological Laboratories, and vice president of E. R. Squibb & Sons, served on



Bottle of diphtheria antitoxin, 1895

Images from the History of Medicine, National Library of Medicine

the Board of Editors of *The JI* (1916–1935).

Two early members, Arthur F. Coca (AAI '16) and A. Parker Hitchens (AAI '13), both served as directors at two pharmaceutical companies and left an enduring legacy on the association.



Arthur F. Coca

The American Association of Immunologists Collection, Center for Biological Sciences Archive, UMBC

Arthur Coca was the driving force behind the founding of *The JI* and served as its first and long-time editor-in-chief (1916–1948), serving also on the Board of Editors (1916–1919) and as an assistant editor (1948–1952). It was Coca, who, as president of the New York Society of Serology and Hematology (SSH), laid the groundwork for a “*Journal of Immunity*” and in the spring of 1915, requested the cooperation of AAI in founding a journal for the burgeoning field of immunology. In the fall of 1915, delegations from AAI and SSH reached an agreement to jointly publish the new journal, *The Journal of Immunology*, and unanimously elected Coca as editor-in-chief.¹⁶ As editor-in-chief, Coca guided the journal through the tumultuous editorial and financial problems of its first few decades, establishing the processes and policies that have made *The JI* the pre-eminent peer-reviewed journal in the field. He also served the organization as a councillor (1916–1918), secretary-treasurer (1918–1946), secretary (1946–1948), and, uniquely, honorary president of AAI (1949–1960). During his 43 years of service to AAI, Coca continuously served on ad hoc committees and recruited new AAI members.

Although he began his professional career in academia, Coca is best known for the 18 years (1931–1949) he served as the medical director at Lederle Laboratories. At the time of his arrival to that company, Lederle was producing antitoxins, vaccines, and other biologics. During his tenure there, Lederle developed new biologics, including pituitary and thyroid extracts and sulfa drugs; manufactured penicillin during the Second World War; and isolated and produced the revolutionary antibiotics Aureomycin and Achromycin.

Although not as well known as Coca, A. Parker Hitchens left an equally profound impact on AAI. He served in multiple leadership positions in the nascent years of the

14. Parke-Davis and Company developed the standardization by chemical assay in 1879. Verification by chemical assay was carried out either by the manufacturers in their own laboratories or by associated university laboratories. See Milton L. Hoefle, “The Early History of Parke-Davis and Company,” *Bulletin for the History of Chemistry* 25, no. 1 (2000): 30.

15. AAI members in major cities, such as Philadelphia and New York, that had large and small pharmaceutical companies were not included unless they supplied a known street address for a commercial institution. For this reason, all industry member counts are conservative, as we only counted members whom we could conclusively determine worked for a commercial institution.

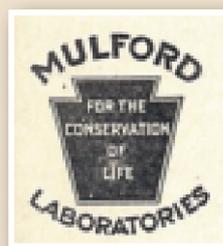
16. For more information on the founding of *The JI*, see “The Founding of *The Journal of Immunology*,” *AAI Newsletter* (December 2011), 17–18.

Diphtheria antitoxin and the growth of biologicals: Mulford and Lederle Laboratories

In 1890, Emil von Behring announced that he had created a successful diphtheria antitoxin. News quickly made the trans-Atlantic journey and came as a relief to many citizens of U.S. cities, especially New York City. In 1887, one of the largest diphtheria epidemics in the history of the city was responsible for 4,509 deaths.¹ Pharmaceutical companies saw antitoxin as a new opportunity for expansion of their businesses into biologics. H. K. Mulford Company and Lederle Laboratories became large producers of effective diphtheria antitoxins. The two companies, however, achieved their leading market positions by different means.

H. K. Mulford Company

Incorporated in Philadelphia in 1891, H. K. Mulford Company initially mass-produced some 800 different medical products. Their largest seller was a water-soluble pill made possible by their patented tableting machine.² With von Behring's diphtheria antitoxin discovery, however,



H. K. Mulford
Company logo, 1922

from *The Journal of Immunology* 7, no. 4

the owners recognized the potential for a lucrative new venture in biologics. The change in the business model towards biologics required new hires. In 1894 Joseph McFarland, a noted bacteriologist and pathologist at the University of Pennsylvania, became the first major hire for this new endeavor, and a year later Mulford produced the first commercial diphtheria antitoxin in the country.³ The antitoxin was an immediate commercial success and the company quickly began expanding the business to other biologics. This expansion included constructing new laboratories for biological, vaccine, and veterinary research, hiring trained scientists—including physicians, pharmacists, chemists, veterinarians, and botanists—and relocating to a larger property. In 1896 the company moved to a 200-acre farm in Glenolden, Pennsylvania, eight miles outside the city limits, and by 1920 the new site had nearly 1,000 employees and 52 buildings, including stables and barns for the hundreds of horses, cows, and smaller animals.⁴ During the 1920s Mulford specialized in human and veterinary serums, antitoxins, and vaccines, and in 1929 they merged with Sharpe & Dohme, Inc. of Baltimore.

1. Gretchen A. Condran, "Changing Patterns of Epidemic Disease in New York City," in *Hives of Sickness: Public Health and Epidemics in New York City*, ed. David Rosner (New Brunswick: Rutgers University Press, 1995), 31.
2. Louis Galambos and Jane Eliot Sewell, *Networks of Innovation: Vaccine Development at Merck, Sharp & Dohme, and Mulford, 1895-1995* (New York: Cambridge University Press, 1995), 11.
3. Galambos, 13, 17.
4. Galambos 18; Robert F. O'Neil, "Recalling the Heyday of Pioneering Drug Firm the H. K. Mulford Co. of Glenolden Produced a Breakthrough Diphtheria Antitoxin," *Philadelphia Inquirer*, December 27, 1992.

association—first as council chair (1914–1917) and then as a councillor (1918–1921).¹⁷

It was in his role as council chair at the first AAI annual meeting in 1914 that Hitchens became responsible for important facets of organizational governance, including the creation of a constitution and bylaws.¹⁸ It was a responsibility that Hitchens took to heart through the many drafts of each until they were adopted on April 6, 1917. Meanwhile, Hitchens assumed other leadership roles. At the second AAI annual meeting (1915),



A. Parker Hitchens
The American Association of Immunologists Collection, Center for Biological Sciences Archive, UMBC

he was appointed by AAI President Webb to a committee to "influence physicians whose qualifications entitled them to membership in the Association."¹⁹ After membership issues were discussed, Hitchens reported that SSH, led by Arthur Coca, was considering the creation of a *Journal of Immunity* and recommended that AAI help with its founding. In quick order, Hitchens was elected to "represent the society in negotiations with Dr. Coca, with authority to render all possible aid, looking to the publication of the journal."²⁰

17. Council chair was an ad hoc position created in 1913 when AAI was founded. The chair was responsible for the operation of the five-member council—the president, vice-president, and secretary were initially ex officio members of the council. Initially, the council was responsible for considering member nominations, selecting a date and site of the annual meeting, and other general policies, such as determining the amount of the annual dues. When the first constitution and bylaws were enacted in 1917, the position of council chairman was discontinued.

18. The American Association of Immunologists, *Minutes of First Annual Meeting*, June 22, 1914. AAI Archives.

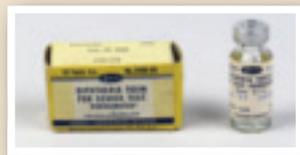
19. Ibid.

20. The American Association of Immunologists, *Minutes of Second Annual Meeting*, 10 May 1915. AAI Archives.

Lederle Antitoxin Laboratories

Lederle Antitoxin Laboratories was founded by former health commissioner of New York City Ernest Joseph Lederle in 1906 to produce diphtheria antitoxin.

Lederle, a trained chemist, had a strong interest in chemical and bacterial testing as it applied to public health and in 36 years at the New York City Department of Health rose in the ranks from milk inspector (1866) to health commissioner (1902). Three years after von Berhing's discovery, Lederle was influential in the creation of the NYC Department of Health bacteriology laboratory under the direction of William Hallock Park (AAI '16, president 1918–1919). The lab focused on methods to identify, control, and prevent communicable diseases.⁵ In 1894, Park and Anna Wessel Williams (AAI '18) isolated the Park-Williams No. 8 strain of diphtheria and used it to create a highly effective antitoxin that was made available to the public the following year.⁶ The antitoxin was produced by the Health Department and provided at no cost to physicians in the city and sold at a nominal cost to health departments in other cities. In 1903, however, with the higher standards of commercial



Diphtheria toxin, Lederle Laboratories, ca. 1951

National Museum of American History, Smithsonian Institution

antitoxins available and pressure from drug manufacturers to cease their anti-free market production, a Health Department directive forced Park's lab to cease production and distribution of the antitoxin.

The following year, 1904, Lederle stepped down as health commissioner after city elections intensified the challenges of the health department's lab, bringing back into power the longtime political machine. Lederle saw opportunity in customers' continuing to request the Park antitoxin following the 1903 interruption in production and resolved to answer the demand. Over the next three years, Lederle recruited scientists and past board colleagues, and, in 1906, founded Lederle Antitoxin Laboratories to produce the diphtheria antitoxin. The new company quickly began taking large orders from across the country. The small and "highly skilled" scientific staff made sure the antitoxin maintained the high standards that Park had produced.⁷ Large sales volumes required an expansion of the laboratories and a relocation from New York City to a 99-acre farm in Pearl River, New York. In those pre-Depression growth years, Lederle Laboratories touted its highly trained scientists working in their modern laboratories to produce bacteriologically sophisticated products.⁸ In the decades that followed, Lederle Laboratories became one of the leading pharmaceutical companies in the United States. Today, after multiple acquisitions, the company is part of Pfizer, Inc.

5. Jonathan M. Liebenau, "Scientific Ambitions: The Pharmaceutical Industry, 1900-1920," *Pharmacy in History* 27, no. 1 (1985): 4; "In Honor of William Hallock Park," *Science* 84, no. 2177 (1936): 261.

6. The Park-Williams strain was also referred to as "American strain #8."

7. Liebenau, 7.

8. Liebenau, 10.

Hitchens was the logical choice. Not only was he a strong advocate for AAI to help found a journal for the field, but also, his involvement in the founding of two other journals, *The Journal of Bacteriology* and *Abstracts of Bacteriology*, gave him insight and experience in the business and editorial management of a new journal. Throughout his professional life, Hitchens continued his service to AAI by helping to organize annual meetings, serving on ad hoc committees, and nominating many future members.

At the time of his involvement in the founding of AAI, Hitchens was biological director of the H. K. Mulford Company. Having joined the company in 1901, as



Package of dried antitetanic serum (ca. 1907) and vial of tetanus antitoxin (ca. 1970)

Images from the History of Medicine, National Library of Medicine

it was expanding research staff to develop antitoxins and vaccines, Hitchens presided over his lab's efforts to develop more effective smallpox and rabies vaccines and production of bacterins and serobacterins and their increases in purity and yield of their diphtheria antitoxin. Hitchens left Mulford in 1918 to enter the U.S. Army Medical Reserve Corps during the First World War and remained in the army as a researcher and teacher for the remainder of his career.²¹

The number of AAI members from industry increased following the Second World War. In 1946, seven of the 37 new members were from the pharmaceutical manufacturers, including American Cyanamid Company,

21. Louis Galambos and Jane Eliot Sewell, *Networks of Innovation: Vaccine Development at Merck, Sharp & Dohme, and Mulford, 1895–1995* (New York: Cambridge University Press, 1995), 21–27.

Eli Lilly & Company, and Lederle Laboratories. Throughout the years, the growth and evolution of the pharmaceutical and biotech industry have been reflected in AAI members and leaders. Some, such as Roger M. Perlmutter (AAI '83, president 1999–2000),²² have moved from academia to industry; others, such as Lewis L. Lanier (AAI '80, president 2006–2007),²³ have moved from academia to industry and back again to academia. Today, AAI members in industry participate actively as speakers at the annual meeting, lecturers at the courses, reviewers and editors for *The JI*, and members of various committees. They also serve as mentors to early-career scientists on industry-focused panels and roundtable events at the annual meeting—important resources through which scientists-in-training can explore the variety of opportunities for scientists within industry.

Just how many members AAI may have had from industry is difficult to say. Few AAI members before 1946 provided institutional affiliations, and most changes in institutions were either never recorded or have been lost. There can be little doubt, however, about how AAI has benefited from the participation and leadership of industry members since its founding. ■

John S. Emrich, Ph.D., AAI Historian

Katlyn Burns, AAI History Intern, contributed to this article.

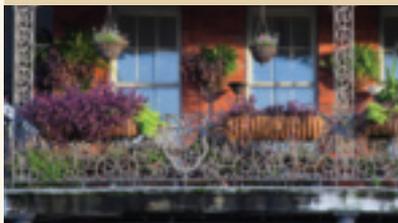
22. Roger M. Perlmutter was a professor (1984–1997) and chairman (1989–1997) in the Department of Immunology, University of Washington, before moving into industry. He was previously at Merck Research Laboratories (1997–2001) and Amgen, Inc. (2001–2012) before taking his current position as executive vice president of Merck & Co. and president of Merck Research Laboratories.

23. Lewis L. Lanier began his professional career as a research assistant professor (1981) in the Department of Pathology, University of New Mexico School of Medicine. He then worked for Becton Dickinson (1981–1991) and DNAX Research Institute for Molecular and Cellular Biology, Inc. (1991–1999) before taking his current position as professor, Department of Microbiology and Immunology and the Cancer Research Institute, University of California San Francisco in 1999.

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THE SCIENTISTS BEHIND THE SCIENCE

AAI Oral History Project Available Online

To provide contemporary investigators and the public a rare view into the lives and times of influential immunologists, AAI arranged for the award-winning Oral Historian Brien Williams, Ph.D., to interview past AAI presidents, beginning in the spring of 2012. Interviewees were asked about their family backgrounds, early interest in science, reasons for studying immunology, career and research highlights, challenges faced, balancing professional and private life, hobbies outside of the laboratory, major changes in immunology over the course of their careers, and the future of immunology and science in the United States. The sessions, typically one and one-half to two hours in length, were professionally recorded and edited in high-definition video.

“Scientific contributions live on as researchers continue to build upon the work of the past, yet present-day investigators often know little about the scientists responsible for them,” said AAI Historian John Emrich, Ph.D., who first conceived of the Oral History Project in 2011. “The ‘Pillars of Immunology’ series in *The Journal of Immunology* makes the connections between past and present science more explicit than they otherwise would be, but investigators rarely have the opportunity to hear about their predecessors’ motivations, their hardships suffered and overcome, their lives outside of the laboratory, or even their candid thoughts on the state of the field.”

To date, 25 past presidents have been interviewed. Their presidential terms span five decades, from that of Herman Eisen (AAI '51, president 1968–69, now deceased) to Leslie Berg (AAI '94, president 2011–12). Included in this group were two past presidents in their 90s, Eisen and David Talmage (AAI '54, president 1978–79, now deceased); six in their 80s; and four in their 70s.

The memories and reflections contained in these interviews constitute an important facet of the history of immunology that would likely be lost to future generations if not preserved in the AAI Oral History Project. As AAI continues to conduct interviews with additional presidents and other influential immunologists, members and the general public are invited to view the oral histories already recorded. Video clips and the full-length interviews, which have been optimized for playback on TVs, computers, and mobile devices, are available at www.aai.org/ohp.



Oral History Interviews Currently Available:

- Herman N. Eisen (1968–69)
- K. Frank Austen (1977–78)
- David W. Talmage (1978–79)
- Jonathan W. Uhr (1983–84)
- William E. Paul (1986–87)
- Max D. Cooper (1988–89)
- Henry Metzger (1991–92)
- Frank W. Fitch (1992–93)
- Ellen S. Vitetta (1993–94)
- Irving L. Weissman (1994–95)
- Richard W. Dutton (1995–96)
- Katherine L. Knight (1996–97)
- Roger M. Perlmutter (1999–2000)
- Philippa Marrack (2000–01)
- James P. Allison (2001–02)
- Paul W. Kincade (2002–03)
- Laurie H. Glimcher (2003–04)
- Susan L. Swain (2004–05)
- Paul M. Allen (2005–06)
- Lewis L. Lanier (2006–07)
- Olivera J. Finn (2007–08)
- Arthur Weiss (2008–09)
- Betty A. Diamond (2009–10)
- Jeffrey A. Frelinger (2010–11)
- Leslie J. Berg (2011–12)



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Faculty

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Introduction to the Immune System

Lewis L. Lanier, *University of California, San Francisco*
Innate Immunity: Introduction to the Cells

Andrea J. Tenner, *University of California, Irvine*
Complement

Wendy L. Havran, *The Scripps Research Institute*
Introduction to Adaptive Immunity

Nilabh Shastri, *University of California, Berkeley*
Antigen Processing and Presentation

Juan Carlos Zuñiga-Pflücker, *University of Toronto and Sunnybrook Research Institute*
MHC Restriction and Thymic Selection

David Nemazee, *The Scripps Research Institute*
B Cell Development and Maturation

Shannon J. Turley, *Genentech, Inc.*
Dendritic Cells: The Bridge Between Innate and Adaptive Immunity

Michael Croft, *La Jolla Institute for Allergy and Immunology*
Effector T Cell Differentiation and Response

Shane Crotty, *La Jolla Institute for Allergy and Immunology*
B Cell Activation and Humoral Immunity

Arthur Weiss, *University of California, San Francisco*
Signaling in the Immune System

Stephen M. Hedrick, *University of California, San Diego*
Immune Homeostasis in Infection and Disease

Ninan Abraham, *University of British Columbia*
Cytokines

Megan K. Levings, *University of British Columbia*
T and B Cell Tolerance

Olivia M. Martinez, *Stanford University School of Medicine*
Transplantation

Peter B. Ernst, *University of California, San Diego*
Mucosal Immunology

Steven F. Ziegler, *Benaroya Research Institute*
Type 2 Immunity

Linda A. Sherman, *The Scripps Research Institute*
Tumor Immunology

Robert L. Modlin, *University of California, Los Angeles David Geffen School of Medicine*
Immunity to Bacterial Pathogens

Michael J. Bevan, *University of Washington*
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Faculty

Marc K. Jenkins, *Center for Immunology
University of Minnesota Medical School
Anatomy of the Immune Response*

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

Bruce Horwitz, *Brigham & Women's
Hospital, Harvard Medical School
Innate Immunity: Gene Regulation*

Albert S. Bendelac, *University of Chicago
Innate Immunity: Cellular Mechanisms*

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

Michael C. Carroll, *Immune Disease Institute
Harvard Medical School
Molecular and Cellular Mediators of Inflammation*

Brian T. Edelson, *Washington University School
of Medicine
Dendritic Cells*

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

Kay L. Medina, *Mayo Clinic
B Cell Development*

Avinash Bhandoola, *NCI, NIH
T Cell Development*

Kenneth L. Rock, *University of Massachusetts
Medical School
MHC-Restricted Antigen Presentation to T Cells*

Leslie J. Berg, *University of Massachusetts
Medical School
Signaling from Antigen Receptors*

Joshy Jacob, *Emory University School of Medicine
B Cell Memory*

Arup K. Chakraborty, *Massachusetts Institute
of Technology
Computational Modeling of Immunological
Processes*

Brian A. Cobb, *Case Western Reserve University
School of Medicine
Glycoimmunology*

Richard S. Blumberg, *Brigham & Women's
Hospital, Harvard Medical School
Mucosal Immunity*

Joel D. Ernst, *New York University School of Medicine
Immune Response to Pathogens*

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and Autoimmunity, and Vaccines*

For complete course details and registration, visit: www.aai.org/Education/Courses

For assistance, contact (301) 634-7178 or meetings@aai.org. Overseas applicants are advised to apply early for visas; for details, visit www.aai.org/Education/Courses/Visa.html. Financial support for underrepresented minority scientists is available through the FASEB MARC Program; for details, visit www.faseb.org/MARC.

GRANT AND AWARD DEADLINES

March 10

Keio Medical Science Prize

- **Prize/Award:** A prize of ¥10 million, a certificate of merit, and award medal in recognition of outstanding, creative achievement in medical and life sciences research
- **Eligibility:** Nominees who have made a breakthrough in medicine and/or life sciences that has contributed to developments in basic or clinical medicine or a closely related life sciences field; nominees must be currently active researchers who are expected to make future contributions to the field
- **Details:** <http://www.ms-fund.keio.ac.jp/prize/index.html>
- **Contact:** k-nomination@adst.keio.ac.jp

March 16

AAI Careers in Immunology Fellowship

(see also Call for 2015 Nominations, p. 9)

- **Prize/Award:** Multiple awards in support of the laboratories of AAI member principal investigators (PIs), each providing one year's salary for a graduate student or postdoctoral fellow working in the PI's lab
- **Eligibility:** AAI member PIs with less than \$250,000 (excluding PI's salary) in annual direct cost
- **Details:** <http://www.aai.org/Awards/CIIF.html>
- **Contact:** fellowships@aai.org

March 18

RWJF Harold Amos Medical Faculty Development Program

- **Prize/Award:** Up to 10 four-year postdoctoral research awards to support physicians and dentists from historically disadvantaged backgrounds; scholars receive an annual stipend of up to \$75,000 along with a \$30,000 annual grant toward support of research activities
- **Eligibility:** U.S. citizen or permanent resident physicians and dentists from historically disadvantaged backgrounds (ethnic, financial, or educational) committed to developing careers in academic medicine or dentistry, contributing to the

understanding and elimination of health disparities, and serving as role models for students and faculty of historically disadvantaged backgrounds

- **Details:** <http://www.rwjf.org/en/grants/funding-opportunities/2015/harold-amos-medical-faculty-development-program--amfdp-.html>
- **Contact:** Nina Ardery, Deputy Director: (317) 278-0500; amfdp@indiana.edu

March 20

L'Oréal For Women in Science Fellowships

- **Prize/Award:** Five fellowship awards of up to \$60,000 each in recognition and support of the contributions women make in STEM fields
- **Eligibility:** Post doctoral women scientists in the United States who are exceptional researchers committed to serving as role models for younger generations; applicants are welcome from a variety of fields, including the life and physical/material sciences, technology (including computer science), engineering, and mathematics
- **Details:** <http://www.lorealusa.com/forwomeninscience>
- **Contact:** Rachel Pacifico: rpacifico@us.loreal.com

April 1

Cancer Research Institute Irvington Postdoctoral Fellowships

- **Prize/Award:** Fellowships of up to \$164,500 over three years to fund and train young immunologists/cancer immunologists at leading universities and research centers; funding supports the cost of stipend or salary, insurance, and other research-related expenses, such as travel to conferences and meetings
- **Eligibility:** Applicants working in areas directly related to cancer immunology, who, at the time of award activation, have a doctoral degree but less than five years of relevant postdoctoral experience (note to M.D. applicants: residency years are not included in this calculation); an eligible project must fall into the broad field of immunology and show relevance to solving the cancer problem
- **Details:** <http://www.cancerresearch.org/grants-programs/grants-fellowships/cri-irvington-postdoctoral-fellowships>
- **Contact:** (212) 688-7515; grants@cancerresearch.org

GRANT AND AWARD DEADLINES

Rolling deadline (applications accepted year round)

Autism Speaks Suzanne and Bob Wright Trailblazer Award Program

- **Prize/Award:** Up to \$100,000 to fund highly novel, 12-month research projects that hold considerable promise for opening new avenues to understanding the causes, diagnosis, subtyping, prevention, treatments, and cure of autism spectrum disorders
- **Eligibility:** Investigators holding full-time tenured or tenure-track faculty appointments or full-time-equivalent non-tenure track appointments at accredited academic, medical, or research institutions
- **Details:** www.autismspeaks.org
- **Contact:** Joan New, grants manager: (609) 228-7313; jnew@autismspeaks.org

Rolling deadline (nominations accepted year round)

The 2015 Golden Goose Awards

- **Prize/Award:** Recognition of individuals or groups whose federally funded research has led to demonstrable, significant human or economic benefits, including benefits unforeseen at the time the research was conducted; the award highlights research that may have appeared unusual or obscure, sounded “funny,” or whose value may have been questioned originally but led, even serendipitously, to scientific or technological breakthroughs of transformational societal impact; recipients are honored during an annual Capitol Hill awards ceremony in Washington, DC
- **Eligibility:** Individual investigators or teams nominated by one or more colleagues for achievements, demonstrating the benefits of federally funded scientific research while highlighting that scientific outcomes build on each other and that resulting technological advances cannot necessarily or easily be predicted at a project’s outset
- **Details:** <http://www.goldengooseaward.org/nominations/>
- **Contact:** info@goldengooseaward.org

AAI Invites Additions to List of Women Speakers

The **AAI Committee on the Status of Women (CSOW)** has revamped the format of the *List of Potential Speakers and Chairs*. (See the November/December 2013 *AAI Newsletter*, page 39.) The committee also announced a new process for individuals to have their names added to the list. The changes are intended to broaden the range of areas of expertise of AAI members and to make the list more accessible and accurate as a resource for enhancing opportunities for women as speakers or chairs at professional meetings.

Listings were originally limited to women serving as heads of immunological research labs, but the CSOW Speaker List is now open to women AAI members fulfilling leadership roles in non-research careers as well.



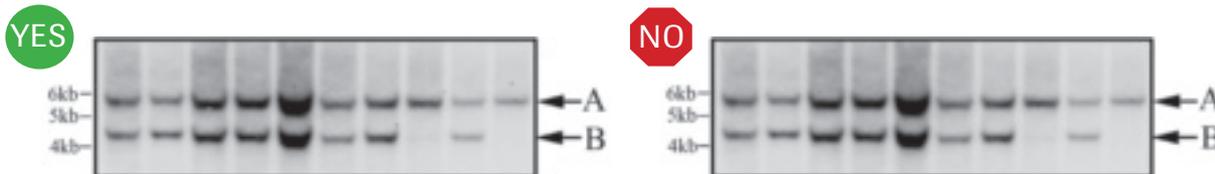
In addition to representing a broader range of leadership roles occupied by women, the list will be more accessible and more easily maintained. Individuals listed will be able to maintain their own entries as each now links to the individual's Web page.

Viewers can determine how well the profile matches their need for a woman immunologist in a particular leadership role.

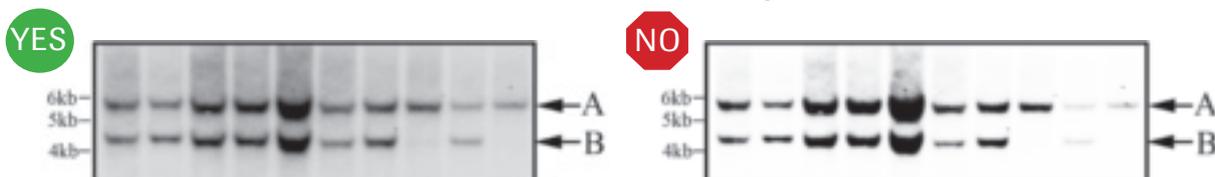
Women currently listed must supply their URLs to remain on the list. To be added to the list, contact Mary Bradshaw, AAI staff liaison for the CSOW (mbradshaw@aai.org).

Before preparing manuscript figures, please read the Information for Authors at <http://www.jimmunol.org/site/misc/authorinstructions.xhtml#mspreparation>

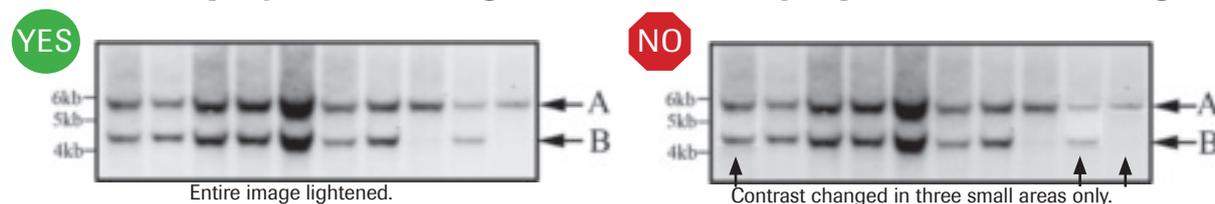
1. Do not erase any part of the image, including the background.



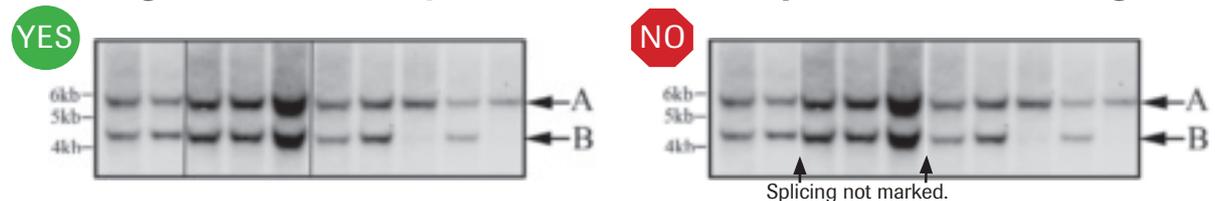
2. Do not use excessive contrast that removes background.



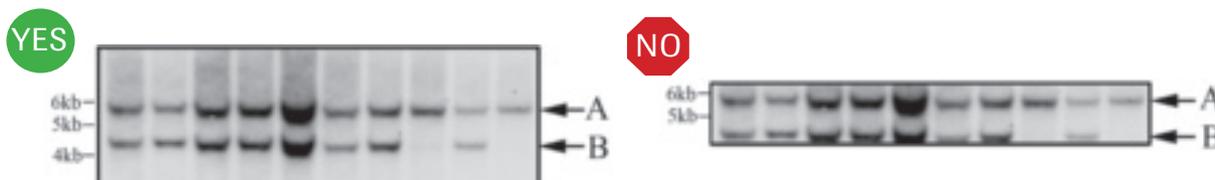
3. Make any adjustments to brightness or contrast equally across the entire image.



4. Indicate any splicing of data from a single experiment by contrasting (black or white) lines; state the manipulation in the legend. Images from different experiments should not be spliced to form a new single image.



5. Crop gels and blots conservatively, retaining important bands.



- All images submitted to *The Journal of Immunology* must accurately represent the original data.
- Original data (digital files, autoradiographs, films, etc.) for all experiments should be fully annotated, secured, and retrievable for up to 10 years.
- The original image file (raw data file) should be kept in an unprocessed and non-compressed file format.
- Figures that are compiled into multi-figure panels should be kept individually.

Meetings and Events Calendar

Mark Your Calendar for These Important Dates!

2015

March 18–20, 2015

Innate Immune Memory, Wellcome Trust Genome Campus
Hinxtton, Cambridge, UK
http://registration.hinxton.wellcome.ac.uk/display_info.asp?id=469

March 28–April 1, 2015

Experimental Biology (EB) (APS, ASPET, ASIP, ASN, AAA, ASBMB)
Boston, MA
Contact: eb@faseb.org

May 4–8, 2015

National Single Cell Transcriptomics Workshop (*Sponsored by the National Human Genome Research Institute, the Institute for Translational Medicine and Therapeutics, and the Penn Program in Single Cell Biology*)
The University of Pennsylvania, Philadelphia, PA
<http://kim.bio.upenn.edu/ppscb/workshops.html>

May 8–12, 2015

**IMMUNOLOGY 2015™
AAI Annual Meeting**
Ernest N. Morial Convention Center
New Orleans, LA
www.immunology2015.org

June 14–19, 2015

**First International Convention:
IMMUNOPHARMACOLOGY -
VACCIPHARMA 2015**
Meliá Marina Varadero
Varadero Beach, Cuba
www.scf.sld.cu

June 29–July 1, 2015

Exploring Human Host-Microbiome Interactions in Health and Disease
Wellcome Trust Genome Campus
Hinxtton, Cambridge, UK
http://registration.hinxton.wellcome.ac.uk/display_info.asp?id=480

July 3–5, 2015

LACA 2015, 5th Latin American Congress on Autoimmunity
Salvador, Bahia, Brazil
<http://laca.kenes.com/>

July 11–15, 2015

**American Society for Virology
34th Annual Scientific Meeting**
University of Western Ontario,
London, Ontario, Canada
www.asv.org

July 14–18, 2015

17th International Congress of Mucosal Immunology (ICMI 2015)
Maritim Hotel
Berlin, Germany
www.socmucimm.org/meetings-events/icm15/

July 14–19, 2015

AAI Introductory Course in Immunology
Long Beach Convention Center
Long Beach, CA
www.aai.org/Education/Courses/Intro/index.htm

August 2–7, 2015

AAI Advanced Course in Immunology
Seaport World Trade Center
Boston, MA
www.aai.org/Education/Courses/Advanced/index.html

September 6–9, 2015

ECI 2015: 4th European Congress of Immunology
Vienna, Austria
www.eci-vienna2015.org

September 27–29, 2015

48th Annual Meeting of the Society for Leukocyte Biology, “Immunity in Health and Disease”
Raleigh, NC
<http://leukocytebiology.org/Meetings/Upcoming-SLB-Meetings.aspx>

October 6–9, 2015

Influenza Vaccines for the World IVW 2015
Albufeira, Portugal
<http://meetingsmanagement.cmail2.com/t/d-l-vpity-vckugr-t>

October 9–13, 2015

ASBMR 37th Annual Meeting
Seattle, WA
www.asbmr.org

October 11–14, 2015

Cytokines2015
Bamberg, Germany
www.cytokines2015.com

November 2–7, 2015

Obesity Week 2015: Where Science and Treatment Meet
Los Angeles, CA
<http://obesityweek.com/>

November 5–8, 2015

14th International Workshop on Langerhans Cells
Kyoto, Japan
www.lc2015.jp

November 15–19, 2015

CD1-MR1 2015
Mantra, Lorne, Victoria, Australia
www.cd1-mr1-2015.org/

2016

February 18–22, 2016

2016 BMT Tandem Meeting
Honolulu, HI
www.cibmtr.org/Meetings/Tandem/index.html

May 13–17, 2016

**IMMUNOLOGY 2016™
AAI Annual Meeting**
Washington State Convention Center
Seattle, WA
www.aai.org/Meetings/Future_Meeting.html

August 21–26, 2016

ICI 2016: International Congress of Immunology 2016
Melbourne, Australia
<http://ici2016.org>

2017

May 12–16, 2017

**IMMUNOLOGY 2017™
AAI Annual Meeting**
Walter E. Washington Convention Center
Washington, D.C.
www.aai.org/Meetings/Future_Meeting.html

Track updated meeting listings anytime via the online Meetings and Events Calendar – visit <http://www.aai.org/Careers/Calendar/index.html>.

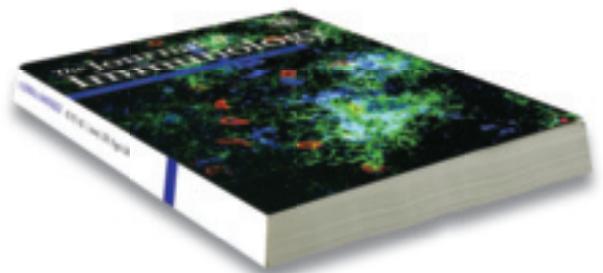
SPECIAL DISCOUNTS FOR AAI MEMBER AUTHORS

WAIVER OF MANUSCRIPT SUBMISSION FEE

Corresponding authors who are regular, associate, emeritus, or honorary AAI members in good standing on the date of manuscript submission to *The Journal of Immunology* receive a waiver of the \$50 submission fee.

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Corresponding authors who are regular, associate, emeritus, or honorary AAI members in good standing on the date their manuscript is accepted for publication in *The Journal of Immunology* receive a \$300 reduction in the cost of each color figure.



For complete details on AAI membership privileges and benefits, eligibility requirements, and application forms, please visit www.aai.org/membership, contact the AAI membership office at 301-634-7195, or email members@aai.org.

For complete details on manuscript submission to *The JI*, please visit www.jimmunol.org, contact *The JI* office at 301-634-7197, or email infoji@aai.org.



IMMUNOLOGY 2015™

Annual Meeting of The American Association of Immunologists

May 8–12, 2015 | Ernest N. Morial Convention Center | New Orleans, Louisiana

Jobs Board

*A Free Recruiting Service for Registrants
and Exhibitors*

Post Online and Meet On-site

AAI is offering career services to both job seekers and employers through a Jobs Board free to meeting registrants and exhibitors at www.immunology2015.org/jobs-board/index.html.

Job Seekers! Whatever your career stage, use this career service at IMMUNOLOGY 2015™ to enhance your professional development!

- **Job Postings.** Review the online AAI Jobs Board to identify postings you wish to pursue. (View new Advance Postings through April 29. Watch for On-site Postings, online or on paper in the Exhibit Hall!)
- **Direct Access to Recruiters.** Job postings will include recruiters' e-mail addresses so that you can contact them directly.

Employers! Advertise your position on a virtual Jobs Board located on the IMMUNOLOGY 2015™ website. By including a contact email, you will receive inquiries directly.

- **Advance Postings.** Postings will be accepted as of February 2, 2015, and will remain online until the end of the meeting. To post job listings in advance of the meeting, contact meetings@aai.org. Advance Postings must be submitted to AAI by April 29, 2015.
- **On-site Postings.** After April 29, 2015, employers wishing to advertise a job on the IMMUNOLOGY 2015™ website may still do so by visiting the AAI Office in the Ernest N. Morial Convention Center between 9:00 AM and 5:00 PM. You may also post a paper announcement on the bulletin board in the Exhibit Hall.

Save Thousands of Dollars in Recruiting Expenses.

Take advantage of this complimentary hiring opportunity at IMMUNOLOGY 2015™. To register for the meeting, visit www.immunology2015.org/registration.

The American Association of Immunologists, Inc.
9650 Rockville Pike | Bethesda, Maryland 20814
Phone: (301) 634-7178 | Fax: (301) 634-7887
Email: infoaai@aai.org | Web: www.aai.org



The Proud History of AAI

1913-2014



Explore the history of AAI at
www.aai.org/about/history

Chronicling the AAI Legacy. AAI staff historians and scientists are rigorously researching, archiving, and publishing materials to preserve the proud heritage of the association. Articles posted in the history section of the AAI website, www.aai.org/about/history, include:

- The Founding of AAI
- The Science at the First AAI Annual Meeting
- The Founding of *The Journal of Immunology*
- “Studies in Anaphylaxis”: The First Article in *The Journal of Immunology*
- Elise Strang L’Esperance: Pioneer in Cancer Prevention and Recipient of Lasker Award
- Immunologists during the First World War: One Soldier-Scientist’s Experience—Stanhope Bayne-Jones
- The 1918–1919 Influenza Pandemic as Covered in *The Journal of Immunology*
- Anna Wessels Williams: Infectious Disease Pioneer and Public Health Advocate
- 100 Years of AAI: A Look Back at Two Early Immunologists in Hawaii
- PI in the Scotland Yard of Streptococcal Mysteries: Rebecca Lancefield
- From the Archives: What’s Old is New Again: Early Editors of *The JI* Act to Address Perennial Challenges in the Peer-Review and Editing Process
- A Legacy of Advocacy Is Born as AAI Confronts McCarthyism
- Creating a Buzz in the Field of Immunology: Mary Hewitt Loveless and the Development of Venom Therapy for the Prevention of Sting-Induced Anaphylaxis
- The Emergence of Immunology in Pittsburgh

AAI Website

The history section of the AAI website continues to evolve as a living archive. Current and future resources include:

- AAI history articles published in the *AAI Newsletter*
- Oral History Project—exclusive interviews offering a rare glimpse into the lives and times of influential immunologists
- Digital Immunology Timeline, including all the images from the physical Centennial Timeline as well as citations for the scientific events
- Profiles of notable AAI members, including AAI Nobel and Lasker recipients, and past presidents and officers
- An eBook of commentaries on “Pillars” articles from *The Journal of Immunology*
- AAI Story Booth—attendees’ favorite immunology recollections, recorded at IMMUNOLOGY 2013™ and IMMUNOLOGY 2014™