

Basic Science Drives New Approach to Cancer Research

Many have loved ones who have been diagnosed with cancer and metastasis, or the spread of cancer through blood or the lymphatics, which is most commonly found in the lungs, liver, brain, and the bones. Unlike tumors, metastases cannot be treated with surgery, and in some cases, subsequently therapy. As Dr. Isaac Witz, Prof. (Emeritus) of Tel Aviv University and a collaborator with the Institute of Human Virology (IHV) at the University of Maryland School of Medicine says, "the picture is much more grim for victims of metastasis." Dr. Witz's lab in Tel Aviv has been working on a particular research model in a quest to learn more about these cancer cells and their spread. One particular model includes human cancer cells implanted into immune deficient mice, or "nude" mice, which do not have a thymus nor T cells, thereby tolerating the growth of tumors. Dr. Witz brought this system of human tumors he is working on – neuroblastoma (NB) to Baltimore, Maryland to collaborate with Dr. Wuyuan Lu, a Professor in IHV's Division of Basic Science and Vaccine Development.

While leukemia is the most frequent cancer among children, NB is the most frequent solid cancer in children, oftentimes metastasizing. Dr. Witz and his colleague, Shelly Maman, a Ph.D. student at Tel Aviv University, found that nude mice implanted with human NB developed cancer in the original organ, or the adrenal gland, and also developed metastases in the lungs. The team found that the lungs also have micrometastases, or dormant cells, which are cells entering an asymptomatic state of quiescence where growth is arrested. Many members of the public are familiar with dormant cells. For example, you may have a family member who was treated for breast cancer and remained very healthy for an extended period of time, only to have the cancer return after 20 or 30 years when dormant tumor cells awakened from their dormancy.

Dr. Isaac Witz

The finding of these NB metastasized dormant cells brings Dr. Witz and Maman

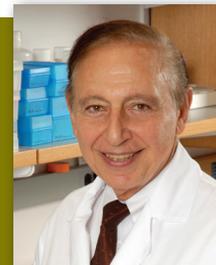
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Director's Message:

April 23 was the 30 year anniversary since my colleagues and I reported that a new retrovirus, now known as HIV, was the agent causing AIDS, which came close to the idea of the cause of AIDS suggested by Max Essex of Harvard's School of Public Health and myself in 1982. This was possible because we had found the virus in 48 patients with this disease and because of our development of an effective HIV blood test, the consequence of a then major breakthrough of continuous production of 4 different HIV strains in some permanently growing cell lines by my co-worker, Mika Popovic and my technician, Betsy Read-Connole. The blood test provided clear additional linkage of HIV to AIDS as it was possible to use the test in hundreds of patients and rapidly confirmed in many hundreds more, by others using the test. We publicly stated in the announcement that very likely these viruses would be the same as found in Paris in 1983 by Luc Montagnier and colleagues in a patient with lymph gland enlargement, but not grown in continuous culture and not linked to AIDS.

Health and Human Services Secretary Margaret Heckler called the press

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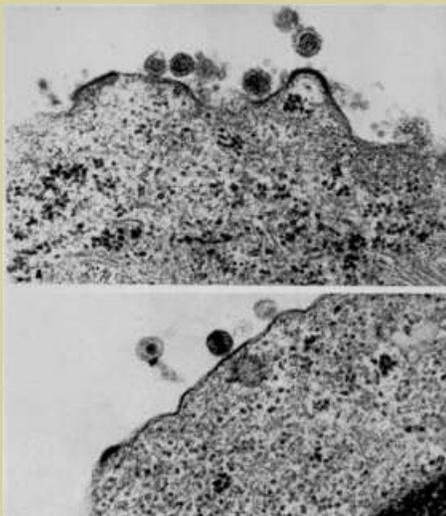


Dr. Robert Gallo

Director's Message (continued)

conference. I learned of this when I was in Europe at a tumor virus meeting with Jim Wyngaarden, then director of the National Institutes of Health. We hurried back to Washington, but this was not my preference because our papers were not going to be published in *Science* until May 4. However, Secretary Heckler learned about our results and felt that some announcement needed to be made because we were claiming that we had enough evidence to say this was the cause of the disease, had a blood test that would preserve the blood supply as well as to confirm that this virus was the causative agent of AIDS because the blood test detected very specific antibodies against this new virus.

It is often said in media that Secretary Heckler said there would be a vaccine in two years—and for that she was criticized. This is not the case and it can be verified by looking at the transcript of the press conference rather than repeating what has been erroneously stated many times over. What she said was that we could grow the virus permanently in cell line culture, which was one of the substantive advances we made that allowed us to get the blood test, and ultimately allowed others to use for testing drugs and for the development of the first successful HIV drugs such as AZT. Secretary Heckler concluded that because of that advance a vaccine could be *tested* in a couple of years. In fact, that was the case because in 1986 my



U.S. Health and Human Services Secretary Margaret Heckler and Dr. Robert Gallo during the 1984 press conference announcing the discovery of the infectious agent (later to be known as HIV) causing AIDS and the development of the blood test.

friend, colleague, and often collaborator at the University of Paris, Daniel Zagury, indeed did test a vaccine in Zaire for a short period of time. Secretary Heckler did not say the vaccine would be successful, and of course developing an effective HIV preventive vaccine has turned out to be a huge complex challenge in the world of vaccines. The press conference heightened tension because it

Associated Press—

This combination made from file photos provided by the National Institutes of Health, Pasteur Institute shows, at top, a form of human T-cell leukemia virus, or HTLV, discovered by U.S. Dr. Robert Gallo and his team at the National Cancer Institute, a division of the National Institutes of Health in Bethesda, MD. The image below shows a lymphadenopathy-associated virus, or LAV, discovered by French Dr. Luc Montagnier of the Pasteur Institute. Both Gallo and Montagnier are credited with isolating the HIV virus that causes AIDS, or the human immunodeficiency virus. The discovery was announced 30 years ago, on April 23, 1984, at a news conference in Washington.

was a government announcement and the government had been under attack for not doing enough in AIDS. It was a time when President Reagan had not used the word AIDS, or discussed AIDS.

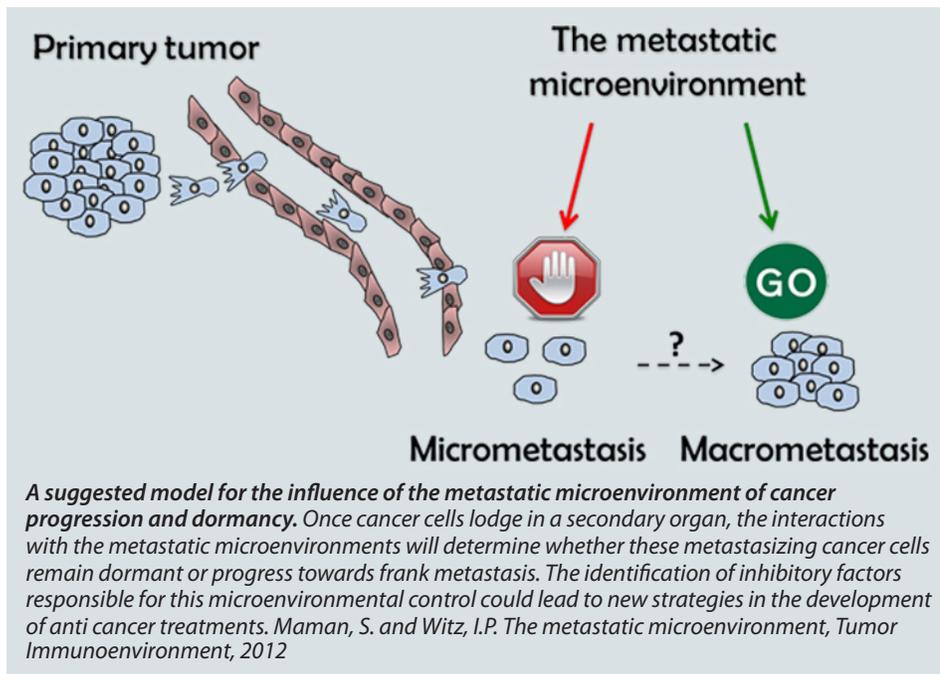
I have been asked my opinions on a cure for HIV/AIDS and an HIV preventive vaccine candidate. I believe a “functional” cure for HIV/AIDS is doable. What is a “functional” cure? It is an HIV positive individual who can suppress the virus through drug therapy so completely that HIV becomes nearly unidentifiable for a sustained period of time—hopefully a full lifetime. Thus, a person with a “functional” cure though HIV infected, will not transmit the virus, have disease, and ultimately does not need treatment any longer. With sufficient resources a “functional” cure may be doable within the next 10 years. Our colleague and the U.S. leader in HIV/AIDS, Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases (NIAID), has been a big supporter in promoting such research efforts.

I also believe our field can crack the vaccine challenge. We previously overcame what was once thought impossible when we developed effective viral drug therapy for the first time as a result of the AIDS crisis. However, the challenge of the HIV/AIDS preventive vaccine is more complex. At our Institute

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to two significant questions: 1) what is the mechanism that keeps these cells dormant? And, 2) what is the mechanism that wakes them up? These two questions are important because if we know the mechanism that makes the cells stay dormant Dr. Witz and Maman could possibly apply this mechanism



Ms. Maman, during the process of generating soluble lung factors from mice. Isolation of factors from mouse lungs was performed for the purpose of identifying lung-derived inhibitory factors that regulate the viability of cancer cells.

to drug therapy, and if you know the mechanism that “wakes up” these cells, researchers can maybe antagonize it.

In Tel Aviv, Dr. Witz and Maman approached the first question, asking what keeps these NB micrometastases in the lung dormant. After many failures and setbacks they made a novel and exciting discovery—that the lungs have a certain material that kills NB cells. The Tel Aviv group had this material from the lung in unseparated and rather crude form. As Dr. Witz continues, “And you know, we have this exciting discovery, but we still needed to define the active molecule to convince our peers in cancer research.” He continued, “And to do that work, one needs a protein chemist. So I asked Dr. Robert Gallo [Director of IHV and a longtime friend] if he could recommend a good protein chemist. Bob said he had just the person—IHV’s Dr. Wuyuan Lu.”

Subsequently, the Tel Aviv University team came to IHV and within a year and a half Dr. Lu and Maman had purified and defined the material, leading to a joint patent between Tel Aviv University and

the IHV’s University of Maryland School of Medicine. This discovery, “The metastatic microenvironment: Lung-derived factors control the viability of neuroblastoma lung metastasis,” was published in the *International Journal of Cancer* in June 2013.

But there was more. Dr. Robert Gallo says, “It’s great we defined the molecule, but even better is that we’ve found a homologous human molecule that kills micrometastatic and metastatic cells. This molecule is found in a human protein that has many known functions, and the killing of tumors is not yet known to be one of them.”

The joint Tel Aviv U—IHV research team is seeking substantive funding so they can answer that second question—what is the mechanism of action (what is “waking up” these dormant cells or what is keeping these cells in check)? The team must also further discover if this new material only works in NB, or does it extend to other cancer cells. Lastly, Dr. Lu explains, “Perhaps more importantly the team needs to demonstrate whether or not their discoveries can ultimately be translated into a new anticancer therapy that blocks tumor metastasis to the lungs.”



Dr. Wuyuan Lu



IHV Leadership in HIV Campus Summit Seeks Control of Epidemic

Facing a crowd of hundreds of health care providers, advocates and researchers, Robert Gallo, MD, recounted the story of how, in 1984, his laboratory at the National Cancer Institute discovered that HIV was the cause of AIDS.



Jeff Crowley motivates the audience to address HIV-related stigma. Photo by Antonio Paterniti

“Very quickly,” he said, “a remote infection became a global infection.”

Today, HIV is treatable if caught early. Patients can lead long, productive lives with proper treatment. Treatment can even help to prevent transmission, slowing the spread of the virus. But it’s not enough, Gallo, director of the Institute of Human Virology at the School of Medicine, told the crowd assembled for the IHV’s Leadership in HIV Summit: Preparing the Future, at the University of Maryland Southern Management Corporation Campus Center on November 4, 2013.

“We want to eliminate the epidemic,” Gallo said. The IHV is working on a vaccine, which will begin Phase I testing next year with funding from the Gates Foundation. But in the meantime, outreach is key, particularly in a city like Baltimore, which consistently ranks among the top 10 cities nationwide in HIV infection rates.

“The answer is to test, test, test,” he told the audience. “It’s about lots of testing and lots of early treatment. That’s why what you’re doing in outreach in a community that has a high level of infected people cannot be more important. Nothing is more important. This meeting, this program of the JACQUES Initiative, and these things cannot be more important in the HIV epidemic.”

The JACQUES Initiative is a program of the IHV that is devoted to providing HIV and AIDS patients with holistic care, treating body and mind, and to promoting testing and treatment in Baltimore’s high-risk communities. The JACQUES Initiative is in the third year of its Preparing the Future program, an interprofessional program aimed at advancing the National HIV/AIDS Strategy by making HIV testing and linkage to care part of the everyday routine in health care on the University of Maryland’s professional campus and covering the Schools of Law, Nursing, Medicine, Social Work, Dentistry, and Pharmacy.



Cierra Foxx of the JACQUES Initiative shares information about community-based volunteer opportunities for Leadership in HIV Summit participants at the Interactive Media Display session. Photo by Antonio Paterniti



Interactive media displays showcase the work of the academic and clinical campus to address the National HIV/AIDS Strategy. Photo by Antonio Paterniti

Preparing the Future involves students from the six professional schools in programs to familiarize them with treating and working with HIV patients. Students from all the schools work in interprofessional teams to offer testing directly to the hardest hit communities in Baltimore. As part of the program, students at the School of Nursing promoted HIV testing through a social media campaign called Put it in Your Mouth—a reference to the oral test for HIV—targeting Baltimore’s gay population. Students from the School of Law visit the JACQUES Initiative clinic each Tuesday to provide legal services to HIV patients—often they need help with custody matters, living wills, and social security issues.

Preparing the Future also has partnered with the School of Dentistry to routinize HIV testing in patients receiving care at the school, and with the Department of Medicine to routinize HIV testing at the University of Maryland Medical Center. The program is teaching the next generation of health care providers to be comfortable and confident discussing HIV with and proactively offering testing to patients, said Jamie Mignano, RSN, MSN, MPH, head of development and information dissemination at the JACQUES Initiative, as she addressed the summit’s audience.

The summit’s keynote speaker was Jeffrey S. Crowley, MPH, program director for the National HIV/AIDS Initiative at the O’Neill Institute for National and Global Health Law at Georgetown University School of Law. Crowley is the former director of the White House Office of National AIDS

Policy, and was instrumental in developing the nation's first National HIV/AIDS Strategy.

Crowley spoke about the White House's commitment to AIDS worldwide, and the value of programs such as the JACQUES Initiative and Preparing the Future. While the federal government is taking responsibility for its role in fighting HIV/AIDS, he said, the summit's audience members need to do the same.

"So what do we need to do?" he asked. "The first [thing], I would say is that each and every one of you needs to take responsibility for fighting HIV stigma, and finding a way to make sure that you show every person that walks on this campus that you care about them and that you're here to support them."

Stigma, Crowley explains, keeps people from being tested and from seeking treatment when they test positive. It enables the spread of AIDS, when people aren't honest with their partners about their status, or don't know that they are positive.

"I am tasking you to fight stigma, but you're not starting from scratch," he told the crowd. Remember, I've visited the JACQUES Initiative. I remember the warm greeting by the receptionist. I observed how clients and staff interact with each other. The first thing you need to do is make sure that what the JACQUES Initiative is doing right is translated across this campus. I think we need to commit to focusing on patient care and research into improving the patient experience. I want to task you with looking at your system of care: what works? What isn't perfect? How can you share what you know so that your great ideas are adopted elsewhere?"

UMB needs to keep doing what's right across all its schools, he said.

"I urge you to ensure that HIV remains high on the agenda of priorities for this institution and this city," Crowley said.

"The fact that you have a National HIV/AIDS Strategy implementation plan is huge. I'm just so proud of that fact. But you still



Derek Spencer, Executive Director of the JACQUES Initiative, challenges the audience to 'use big words' to set goals to address the HIV epidemic. Photo by Antonio Paterniti

have a serious epidemic in the U.S. and in Baltimore. So whatever role you play, make a personal commitment to working toward ending the epidemic.

"Make sure that when research priorities are set, HIV remains prominent. It could be that when issues come up in the clinic, discussing the impact on patients with HIV is part of the dialogue. Don't be afraid to talk about HIV."

Much of the American HIV/AIDS dialogue has focused on what to do about the global epidemic, including the President's Emergency Preparedness Fund for AIDS Relief, which funds HIV/AIDS programs worldwide, Crowley said. But providers and the AIDS community shouldn't forget the Americans struggling with the virus, he added.

"Somewhere along the way, we stopped talking about HIV in this country," Crowley said. "Whether it's in the cafeteria, at church, at your child's school, talking to your partner—don't be afraid to say the wrong thing."

UMB has the power to be a major player in fighting the epidemic, even in Baltimore, where HIV rates are among the highest in the nation, he said.

"I don't have all the answers," Crowley said in closing. "I do know that few national challenges are solved by being ignored.

Take responsibility for fighting HIV stigma, focus on ways to improve the patient experience, keep HIV on the agenda across this institution and across this city and keep talking about HIV, because it's still a pressing issue in Baltimore."

The November 4 Summit ended with a celebratory reception to launch the book called "Life Don't Have to End." The book is a compilation of real stories and photographs from HIV positive men and women living in a large urban environment in 2013.



Book cover of "Life Don't Have to End." by Cricket Barrazotto, released at the Leadership in HIV Summit on November 4, 2013. Photo by Antonio Paterniti

JACQUES Initiative Wins Staff Diversity Award



Staff and volunteers of the JACQUES Initiative provide HIV testing and linkage to care at City Uprising HIV Outreach Day 2013. Photo by Cricket Barrazotto

Award Presentation at Black History Month Celebration

IHV's JACQUES Initiative received its Diversity Recognition Award at the University's Black History Month celebration on Monday, Feb. 10 in the Medical School Teaching Facility auditorium.

MLK Diversity Recognition Awards

The Dr. Martin Luther King Jr. Diversity Recognition Awards are presented for individual and/or group achievements in the areas of diversity and inclusiveness.

Each year, UMB schools and administrative units are asked to nominate individuals or groups that have played a leadership role or been an integral part of the diversity effort at the University.

Outstanding Staff Award

Founded in 2003, the JACQUES Initiative is a program of the IHV at the School of Medicine. It employs a multidisciplinary, expert staff to address HIV primary care and outreach in Maryland.

Most unique is the JACQUES Initiative's active engagement in the community. More than 500 volunteers, including students, professionals, and members of the faith community, perform HIV testing and outreach each year.

"Preparing the Future"

Since 2011, the JACQUES Initiative has led a University wide effort at the University of Maryland, Baltimore (UMB) called "Preparing



Staff and volunteers of the JACQUES Initiative, including UMB students, engage clients in HIV testing and linkage to care at City Uprising HIV Outreach Day 2013. Photo by Cricket Barrazotto

the Future" that mobilizes the academic and clinical campus to address the goals of the JACQUES Initiative's National HIV/AIDS Strategy.

As a result, more than 500 students across six professional schools have been involved in an interprofessional didactic and hands-on curriculum.

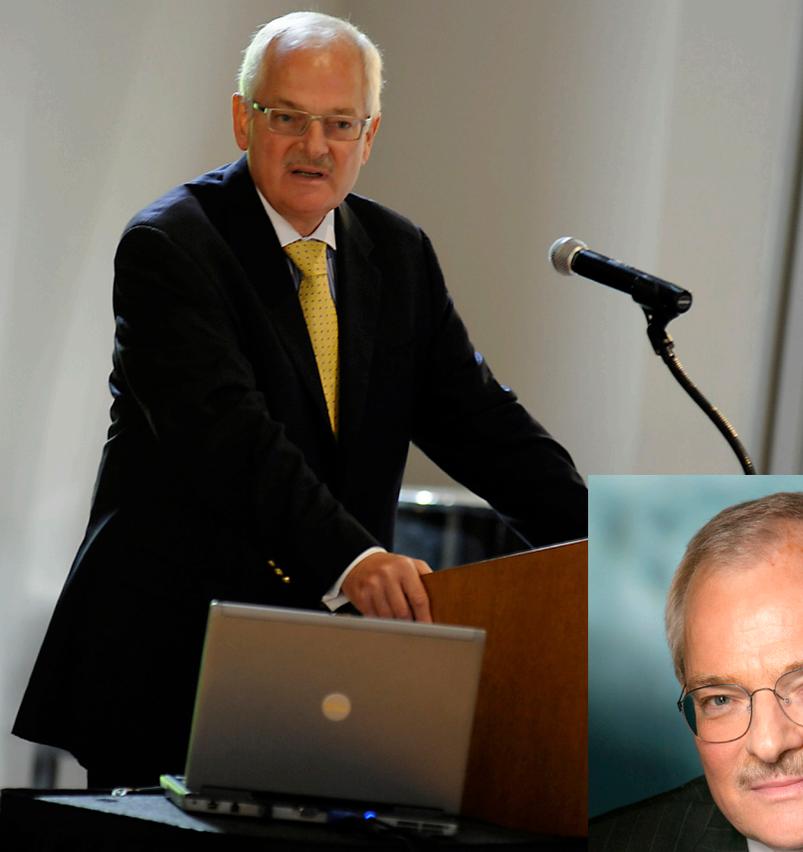
In 2014, 20,000 citizens will be tested by a multidisciplinary team of health professionals who have incorporated routine HIV testing into their practice at the University of Maryland Medical Center.

"We are honored to be the staff recipient of the Dr. Martin Luther King Jr. Diversity Award," said Derek Spencer, MS, CRNP, executive director of the JACQUES Initiative. "With passion, purpose, and a deep calling to serve, the JACQUES Initiative staff embodies the ideals and principles of the great Dr. Martin Luther King Jr."

The recipients serve as models of the ideals epitomized by the life and work of Dr. King.



JI staff and UMB students doing patient case rounds together in "Preparing the Future" clinic. Photo by Cricket Barrazotto



GVN and IHV Remember Reinhard Kurth

Kurth's Legacy Memorialized with Scholarship Fund

In 2011, Dr. Reinhard Kurth served as keynote lecturer at IHV's annual Marlene and Stewart Greenebaum Lecture series.

Professor Reinhard Kurth, MD, Global Virus Network (GVN) co-founder and Institute of Human Virology Board of Advisors member, passed away on February 2 after a long valiant fight against cancer. Dr. Kurth was on the frontline of AIDS research having contributed to the understanding of how HIV attacks cells, ultimately leading to disease. He helped pioneer a scientific field that came to be known as endogenous human retrovirology, which focuses on viruses not known to cause disease, but may have important roles in biology. Dr. Kurth, through this cutting-edge research, provided biomedical scientists with the tools necessary to research with, and to study, viral sequences contained within the human genome.

Dr. Kurth was a leading figure in biomedicine in Germany. Most recently, he served as chairman of the Foundation Council of the Ernst Schering Foundation. He previously served as President of the Paul-Ehrlich-Institute, the Robert Koch Institute, and the German Drug Safety Institute. All three institutions are pivotal in safeguarding the health of the German people and critical partners to institutions globally. He was an elected member of the German National Academy of Sciences (Leopoldina) as well as of the Berlin-Brandenburg Academy of Sciences. In 2005, Dr. Kurth became a member of the American Philosophical Society. Among his many lifetime awards and honors for advancing



medicine and science, Dr. Kurth received the Order of Merit of the Federal Republic of Germany in recognition of his scientific contributions and public service in 2005.

Dr. Robert Gallo, one of the three co-founders of GVN and director of the Institute of Human Virology at the University of Maryland School of Medicine in Baltimore, Maryland, USA, a GVN Center of Excellence, said, "Reinhard Kurth was one of the best medical virologists in the world. He was able to galvanize investigators from Germany, including from the Robert Koch Institute, the Technical University of Munich, and the University of Marburg, to join in the important efforts of the Global Virus Network (GVN) for future medical virologists and for helping policy

leaders understand the nature of emerging and re-emerging virus infections. He was an invaluable leader of German health sciences, an important advisor to me, and a close, personal friend. His absence will leave a significant hole in my life, and that of many others."

Dr. William Hall, also a co-founder, and director of the Centre for Research in Infectious Diseases at University College Dublin's (UCD) School of Medicine and Medical Science in Dublin, Ireland, one of the GVN's Centers of Excellence, said, "Recognizing Reinhard's deep concern that young scientists do not have sufficient opportunities to encourage them toward medical virology career paths, we are honoring his legacy of science and service with the establishment of the Global Virus Network Reinhard Kurth Scholarship Fund. This Fund will support long- and short-term training opportunities for the next generation of medical virology leaders who will be on the front lines of pandemic preparedness, and who will help us tackle viral diseases which threaten countries worldwide today." To learn more information, or to contribute to the Reinhard Kurth GVN Scholarship fund, please visit www.gvn.org.

Pioneering Virologist Robert C. Gallo, M.D. Named First Homer & Martha Gudelsky Distinguished Professor In Medicine

Robert C. Gallo, M.D. was named the first Homer & Martha Gudelsky Distinguished Professor in Medicine at the University of Maryland School of Medicine during a ceremony November 7. The ceremony also honored the Gudelsky Family Foundation for their extraordinary generosity in supporting the Institute of Human Virology (IHV) at the University of Maryland School of Medicine in Baltimore, MD. The IHV is a leading international center of basic science, epidemiology, and clinical research for a wide variety of chronic and deadly viral and immune disorders. Dr. Gallo, who is widely known for his pioneering research in the field of human retroviruses with his discoveries of, II-2, HTLV-1 and HTLV-2, his co-discovery of HIV as the cause of AIDS, and his development of the HIV blood test, is Professor of Medicine and Director of the Institute of Human Virology in the School of Medicine, and co-founder and Scientific Director of the Global Virus Network (GVN).

John Gudelsky, the President and CEO of The Homer & Martha Gudelsky Family Foundation, Inc., and the son of Homer and Martha Gudelsky, commented: "This endowed professorship was established by our family foundation in recognition of the extraordinary professors and doctors at the University of Maryland School of Medicine and at the University of Maryland Medical System, who are innovating new technologies and protocols that will help advance and improve the health and well-being of fellow human beings in Maryland and throughout the world. We are honored that Dr. Gallo, a preeminent international scientist, has been selected to be the first beneficiary of our endowment," he said.



Honored guest speakers Reinhard Kurth, PhD and Max Essex, DVM, Robert Gallo, MD, School of Medicine Dean Al Reece, MD, PhD, MBA, Honored guest speaker and IHV Board Chair Terry Lierman, and Department of Medicine Chair Stephen Davis, MBBS



L to R: Robert Gallo, Jr., Mary Jane Gallo, Robert Gallo, MD, Marcus Gallo and Caroline Vega

The Homer & Martha Gudelsky Family Foundation, Inc. established The Homer & Martha Gudelsky Distinguished Professorship in Medicine in December 2005 in recognition of the distinguished medical careers of Donald E. Wilson, MD, MACP, Dean Emeritus, and John A. Kastor, MD, professor and former chair of the Department of Medicine. The Foundation has been a loyal supporter of the School of Medicine since 1969, when the Foundation established the Harry Gudelsky Fund, in honor of Homer Gudelsky's brother, to provide support for students who are contributing directly to active research programs toward the understanding and control of cancer and heart disease. Additionally, the Foundation established the Dr. Emily Fairchild Endowment for the Residents' Support Fund in December 2008 and donated \$5 million to the University of Maryland Medical System in 1991 to construct the 10-story state-of-the-art clinical tower on Lombard and Greene Streets, which today bears the name "The Homer Gudelsky Building."

"Dr. Robert Gallo is a world-renowned scientist whose breakthrough discoveries and scholarly contributions have impacted the University of Maryland School of Medicine for more than two decades," said E. Albert Reece, M.D., Ph.D., M.B.A., vice president for medical affairs at the University of Maryland and John Z. and Akiko K. Bowers Distinguished Professor and Dean at the University of Maryland School of Medicine. "He is a visionary scientist and investigator who has unlocked many important mysteries of human viruses and diseases. He embodies all of the attributes of a faculty member who holds a distinguished professorship. Honoring Dr. Gallo in this way is long overdue."

Dr. Gallo and his colleagues, IHV Associate Director, William Blattner, M.D. and IHV Associate Director, Robert Redfield, M.D., formed the Institute of Human Virology in 1996 as a partnership between the State of Maryland, the City of Baltimore, the University System of Maryland, and the University of Maryland

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Author David Quammen Keynotes Greenebaum Annual Lecture

The Ninth Annual Marlene and Stewart Greenebaum Lecture hosted guest lecturer, David Quammen. David Quammen is an author and journalist whose twelve books include *The Song of the Dodo*, *The Reluctant Mr. Darwin*, and most recently *Spillover*, a work on the science, history, and human impacts of emerging diseases (especially viral diseases), which was short-listed for seven national and international awards. In the past thirty years he has also published a few hundred pieces of short non-fiction—feature articles, essays, columns—in magazines such as *Harper's*, *National Geographic*, *Outside*, *Esquire*, *The Atlantic*, *Powder*, and *Rolling Stone*. He writes occasional Op Eds for *The New York Times* and reviews for *The New York Times Book Review*. Quammen has been honored with an Academy Award from the American Academy of Arts and Letters, and is a three-time recipient of the National Magazine Award. He is a Contributing Writer for *National Geographic*, in whose service he travels often, usually to wild and remote places. Home is Bozeman, Montana.



David Quammen

With close to two hundred in the audience on October 29, Quammen's Greenebaum Lecture was titled "Spillover: The Animal Origins of Human Infectious Disease, and the Search for the Next Big One." Stewart Greenebaum, a close friend and IHV Board of Advisor member, sponsors this annual IHV series insisting that the keynote speaker be someone who has made substantial scientific contributions, while caring for the betterment of the human condition.



Top L to R: IHV's George Lewis, PhD, IHV Associate Director Robert Redfield, MD, UMB President Jay Perman, MD, Keynote Lecturer David Quammen, IHV Director Robert Gallo, MD, IHV supporter Michael Greenebaum, IHV Board Chair Terry Lierman, IHV COO Dave Wilkins

Bottom L to R: IHV Associate Director William Blattner, MD, IHV Associate Director David Pauza, PhD, Department of Medicine Chair Stephen Davis, MBBS, School of Medicine Dean Al Reece, MD, PhD, MBA and former Governor Parris Glendening, PhD

BOARD OF ADVISORS NEWS



Ellen Ratner Joins Board of Advisors

Ellen Ratner is the Bureau Chief of Talk Radio News Service which covers the U.N., the White House, Congress, and the Pentagon. She is also a contributor for Fox News Channel. She has served as White House reporter for the Talk Radio News

Service where she provides exclusive reports to talk radio stations across the United States. She is the author of "101 Ways to Get Your Progressive Ideas on Talk Radio," as well as her more recent (with Anne Gehman) "Self Empowerment: Nine Things The 19th Century Can Teach Us About Living In The 21st." She is on the board of WINDREF, an educational and research foundation in Grenada, West Indies and The Hunter School in New Hampshire. Ms. Ratner is founder of "Goats for the Old Goat," a program of goats, medicine, and education for South Sudan in Africa. Previously, she worked in mental health, where she co-founded Pride Institute, the first inpatient addiction treatment center for gay men and lesbians. During the AIDS crises, she was President of The National Lesbian and Gay Health Foundation.



John Evans Re-Elected to the National Cable and Telecommunications Association (NCTA) Board of Directors and Recognizes 35 Years of C-Span

IHV Board of Advisor member John Evans was re-elected In April to the National Cable and Telecommunications Association (NCTA) Board of Directors to serve a 3 year term. This will be his 33rd year on the Board making him the

longest serving Board member in the history of the NCTA.

Additionally, C-SPAN, co-founded by Evans, celebrated its 35th Anniversary on March 19. Evans recalled the "crazy idea" fellow C-SPAN co-founder Brian Lamb and he had over lunch one day in Arlington, VA in 1977. On March 19, 1979, then U.S. Speaker of the House Tip O'Neill banged the gavel to open the first televised session of the House of Representatives and a brand-new channel called C-SPAN, which transmitted the images to 3.5 million cable television homes. Today, because of the Cable Industry's support, C-SPAN is now three networks in SD and HD reaching over 100 million households, a radio station, an incredibly rich website and online video library, a robust social media presence, a traveling bus, 6 "Local Content Vehicles," and an education foundation that supports classroom use by 40,000 teachers and hundreds of thousands of students.



Jeff Trammell Equality Virginia names him OUTstanding Virginian 2014

Equality Virginia, a statewide, non-partisan education, outreach, and advocacy organization seeking equality for Lesbian, Gay, Bisexual, and Transgender Virginians (LGBT), highlighted IHV Board of Advisor member Jeff Trammell, as an OUTstanding Virginian 2014 for his 25-year career in public service and government affairs,

among them: As Rector of the College of William and Mary, the first openly LGBT chair of the board of trustees of a major American university (2011–13); first openly gay member of William and Mary's Board of Visitors (2005–13); and, first openly LGBT member of the board of trustees of the Association Governing Boards of Universities and Colleges, which encompasses some 40,000 university trustees across the country (2012). This February, Virginia Governor Terry McAuliffe appointed Trammell to the Virginia Commission on Higher Education Board Appointments, a body charged with recruiting leaders for board service in Virginia's universities.



Attorney Timothy C. Moynahan Moves Into New Offices in Waterbury

IHV Board Member Tim Moynahan (center) welcomed area professionals and City of Waterbury executives to a ribbon cutting in the new office location of The Moynahan Law Firm at 60 North Main Street in Waterbury. Moynahan has been practicing law in the Waterbury region since 1964 and the focus of the law firm's practice is personal injury and criminal defense, while collaborating on corporate and commercial law, employment and labor, estate and probate, family law and domestic relations, immigration, intellectual property, international law, real estate, and workers' compensation. The Moynahan Law Firm also recently established offices at 49 Peter Road in Southbury.



Steven Wozencraft on U.S. State Department Mission for LGBT Global Equality Fund

IHV Board Member Steven Wozencraft, Chairman and CEO of JOD Global Philanthropies and an advocate for Lesbian, Gay, Bisexual, and Transgender (LGBT) rights, visited Sweden, Myanmar and Japan this spring as a Partners Committee representative of the Global Equality Fund (GEF). U.S. Secretary of State Hillary Clinton launched the GEF in December 2011 to promote LGBT civil rights and protection.

Pioneering Virologist Robert C. Gallo, M.D. Named First Homer & Martha Gudelsky Distinguished Professor In Medicine (continued)

Medical System. The IHV is the first institute of the University of Maryland School of Medicine, and is home to some of the most globally-recognized and world-renowned experts in the field of human virology.

“Needless to say, I am very happy and honored by this distinction,” Dr. Gallo said. “I am, of course, first and foremost grateful to the Gudelsky Family Foundation, School of Medicine Dean E. Albert Reece, Department of Medicine Chair Stephen Davis, and IHV Board of Advisors Chair Terry Lierman for helping to establish this honor. I will be very proud to wear the Gudelsky name.”

Before co-founding the IHV, Dr. Gallo spent 30 years at the National Cancer Institute, as head of Tumor Cell Biology. Dr. Gallo’s current work at the IHV combines the disciplines of research, patient care, and prevention programs in a concerted effort to speed the pace of medical breakthroughs. In particular, Dr. Gallo is the principal investigator of the IHV’s promising HIV preventive vaccine candidate. Dr. Gallo has authored over 1,200 scientific publications as well as the book “Virus Hunting - AIDS, Cancer & the Human Retrovirus.” Dr. Gallo has been awarded 31 honorary doctorates and was two time recipient of the Albert Lasker Award in Medicine (1982 and 1986). Dr. Gallo is a member of the National Academy of Sciences and the Institute of Medicine.

Director’s Message continued

of Human Virology in Baltimore, in collaboration with Profectus Biosciences Inc., we have a vaccine candidate funded largely by the Bill & Melinda Gates Foundation and, in part by NIAID. Similar to the modest success of the U.S. Army Thai trials in 2009, we are able to produce antibodies for protection in monkeys. But in too brief a time period (also like the Army Thai trial) the requisite antibodies are no longer produced. We need to make these antibodies last longer for protection because we know vaccine boosting several times a year is not feasible. Thus, we need more basic science advances as we progress with additional trials. My colleagues in the vaccine work include IHV’s George Lewis, Tony DeVico and Profectus’ Tim Fouts.

Reporters also often ask the question “what were the lessons learned during the early years of the AIDS crisis?” Among other things, there was not an organized global approach to solving the cause of AIDS. No authority directed my lab—the lab that had just discovered retroviruses in man—to investigate the cause of this new disease that was very much looking like a human retrovirus. It was only on a whim that I happened to hear of the early infections and symptoms from clinicians, and more importantly from a NIH lecture from James Curran, then at the Centers for Disease Control (CDC) that I postulated, as previously mentioned, with

my friend Max Essex that the cause might be a retrovirus, and ultimately directed my lab resources toward researching the new disease.

As a result of this experience, in addition to the serious decline of students entering the field of medical virology, my two colleagues and I, including William Hall, MD, PhD, director of the Centre for Research in Infectious Diseases at University College Dublin, Ireland and the late Reinhard Kurth, PhD, then chairman of the Ernst Schering Foundation in Berlin, Germany co-founded the Global Virus Network (GVN) in 2011. Our intention was to create the kind of safety net of leading medical virologists that did not exist when HIV first emerged. Today, we have this safety net in place, with GVN scientists collaborating and communicating. The global community is therefore better prepared to tackle viral diseases of all kinds. The GVN’s mission is to combat current and emerging pandemic viral threats through international collaborative research, training the next generation of medical virologists, and advocacy. The GVN is a non-profit organization comprised of top medical virologists from more than 20 countries covering expertise in every class of human virus causing disease. We look forward to your continued support!

IHV Awards



"Ceska Hlava," or Czech Brains

Mikulas Popovic, MD, PhD, adjunct professor, Institute of Human Virology, Division of Basic Science and Vaccine Development, received the Czech Republic's most scientific prestigious award from a private, non-profit organization, "Ceska

Hlava," or Czech Brains, in close collaboration with the government of the Czech Republic during a ceremony on November 17, 2013 in Prague. The Ceska Hlava honor is given to scientists who are, or were, a citizen of the former Czechoslovakia, or Czech Republic, and made a significant contribution to science abroad. Dr. Popovic was honored with the Ceska Hlava Award for his major contributions to the field of human retrovirology and his contributions to the development of the HIV blood test.

The Award ceremony was held in a historical building known as "Narodny dum," or Nation's House. Mr. Pavel Cyrani, vice president of CEZ corporation and the main sponsor of Ceska Hlava together with the vice speaker of the Czech Republic

Senate, Dr. Premysl Sobotika presented Dr. Popovic with the esteemed Award. The laureats were also honored during a ceremony in the Czech Republic Senate, where they were welcomed and presented an official letter of recognition by Dr. Alena Gajdusekova, the first vice speaker of the Czech Republic Senate.



Dr. Premysl Sobotika presented Dr. Popovic with the esteemed Award

FELLOWS OF THE AACR ACADEMY



Fellow of the American Association for Cancer Research (AACR) Academy Class of 2014

Robert Gallo, MD, director of the Institute of Human Virology and The Homer & Martha Gudelsky Distinguished Professor in Medicine and Professor of Microbiology and Immunology, was elected as a Fellow of the American Association for Cancer Research (AACR) Academy Class of 2014. The AACR Academy serves to recognize and honor distinguished scientists whose major scientific contributions have propelled significant innovation and progress against cancer. The Academy represents a separate entity within the American

Association for Cancer Research and does not constitute an additional membership category. All members of the Academy are designated as Fellows of the AACR Academy and are nominated and elected through a rigorous peer review process involving current Fellows, which evaluates individuals on the basis of their stellar scientific achievements in cancer research. Only individuals who have made exceptional contributions to cancer and/or cancer-related biomedical sciences are eligible for election as Fellow of the AACR Academy.

Discovery is published biannually. Complimentary copies are available upon request.

Questions/Comments? Contact Nora Grannell, Director of Public Relations & Marketing, NGrannell@ihv.umaryland.edu

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Giants in Oncology Lecture Series

On March 10, Robert Gallo, MD, director of the Institute of Human Virology and The Homer & Martha Gudelsky Distinguished Professor in Medicine and Professor of Microbiology and Immunology, lectured in Arkansas at the “Giants in Oncology” lecture series, which is co-sponsored by the Winthrop P. Rockefeller Cancer Institute and the Myeloma Institute for Research and Therapy at the University of Arkansas for Medical Sciences. The annual event was inaugurated in 2012 and features a scientist of world-renown whose contributions to the field of Hematology/Oncology have made a significant difference in the understanding of disease biology, treatment, and prevention.



Dr. Robert Gallo lectures at the University of Arkansas



Dr. Robert Gallo lectures at LaRoche College in Pittsburgh, PA

Global Programs, Global Solutions Conference

On March 28, Robert Gallo, MD, director of the Institute of Human Virology and The Homer & Martha Gudelsky Distinguished Professor in Medicine and Professor of Microbiology and Immunology, was the keynote speaker at LaRoche College's ninth annual Global Problems, Global Solutions Conference on “Awareness to Action: Combating HIV/AIDS, Malaria, and Other Diseases.” The Conference, in partnership with Brother's Brother Foundation, the University of Pittsburgh, and the Pittsburgh Council for Higher Education, focuses on critical global concerns to the Millennium Development Goals established by the United Nations to battle issues such as hunger and poverty, peace and justice, gender inequality, and child mortality.

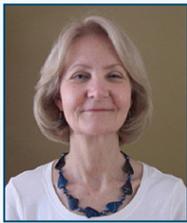


IHV Board Member Dr. William Haseltine presents Dr. Redfield the My Hero Award

My Hero Award

On November 5, Robert Redfield, MD, associate director of the Institute of Human Virology and director of the Clinical Care and Research Division, received the My Hero Award, given at the AID FOR AIDS Annual My Hero Gala in New York City. The My Hero Award honors people from the arts, business, public health, philanthropic, and other communities who have made substantial contributions to the fight against HIV and AIDS. Dr. Redfield's impressive career in medical research and deep commitment to finding effective forms of treatment for people with HIV—including his work at the IHV to ensure quality treatment for people in some of the poorest countries in the world—made the organization “proud to recognize Dr. Redfield as a hero in our common struggle against the HIV epidemic.”

IHV New Grants



Suzanne Gartner, PhD,

Associate Professor, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a two year grant in the amount of \$372,207 from the National Institute of Allergy and Infectious Diseases entitled "HIV Infection in Bone Marrow: A Reservoir for Viral Persistence". The long term goal of this

project is to (1) quantitatively compare levels of HIV infection in macrophages and T-cells using bone marrow specimens from infected individuals on HAART, and (2) examine mechanisms of HIV persistence in bone marrow macrophages.



Chiara Orlandi, PhD,

Post-Doctoral Fellow, Division of Basic Science and Vaccine Research, Institute of Human Virology, received a CAVD (The Collaboration for AIDS Vaccine Discovery) exchange grant from Duke University (prime: The Bill and Melinda Gates Foundation) in the amount of \$16,731 entitled: "HIV-1 Env-specific Antibody Synergy

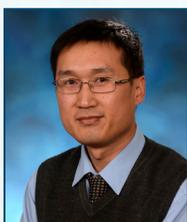
for Protective Fcγ-Receptor Functions in the Context of Vaccine Design and Immunogenicity Assessment". The goal of this scientific exchange between Dr. Orlandi (Dr. George K. Lewis Lab, UMB) and Dr. Pollara (Dr. Guido Ferrari Lab, Duke University) is to close the gap in knowledge between these two laboratories with the specific aim of defining the contribution of Ab synergy-mediated protective Fcγ-Receptor functions at both time of virus entry and exit on the production of progeny virus in a relevant in vitro model.



Kurt Piepenbrink, PhD,

Post-Doctoral Fellow, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a two-year fellowship from the National Institutes of Health entitled "Structure and Function of Type IV Pili in Clostridium difficile." The fellowship is for \$106,132 over two years. Clostridium difficile is a bacterium which

can become invasive, leading to an infection of the colon which is difficult to treat and it is likely that some of that virulence is due to the ability of C. difficile to form appendages called Type IV pili (T4P). The goal of this project is to determine the structures of pilin proteins, the subunits that form T4P and to understand how they come together to form pili and what parts of human cells those pili interact with. There is currently no vaccine for C. difficile and antimicrobials are frequently ineffective; making it particularly important to learn more about how C. difficile colonizes its human host.



Haishan Li, PhD,

Assistant Professor, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a two-year grant entitled "Targeting antiapoptotic signaling for eradication of HIV latent reservoir." The grant is for \$443,334 and is from the Creative and Novel Ideas in HIV Research grant program through

the University of California San Francisco. Latent HIV reservoir has a long half-life with unknown mechanisms. HIV might develop a capacity to stimulate anti-apoptotic activities as a key part of the latency mechanism, which might account for the greatly increased half-life of reservoir cells. The grant will attempt to define the mechanism for durable survival so that a new approach to eliminating the latent HIV reservoir might be found.



Wuyuan Lu, PhD,

Professor, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a two-year grant in the amount of \$200,000 from the National Institutes of Health entitled, "D-peptide activators of p53 as anticancer therapeutics." The proposed study

aims to design a novel class of D-peptide antagonists of MDM2 and MDMX to activate p53 for potential anticancer therapy.



Greg Snyder, PhD,

Assistant Professor, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a grant from the American Cancer Society Institutional Research Grant entitled "Characterization of the B-cell lymphoma mutation MyD88." The grant is for \$30,000 for one year. This ACS-IRG pilot grant

aims to define the molecular mechanisms by which the oncogenic MYD88 mutation leads to spontaneous and chronic signaling, in order to develop novel microbial-derived therapeutics to treat inflammation and associated pathology.



Eric Sundberg, PhD,

Professor, Division of Basic Science and Vaccine Development, Institute of Human Virology, received a grant from the American Asthma Foundation, entitled "Forward engineering the innate immune response to control asthma. The award runs from 7/1/13-6/30/15 for a total award of \$300,000. The aims are to elucidate

the molecular basis of agonist and antagonist cytokine signaling through the IL-36 receptor by X-ray crystallography, mutagenesis and functional analyses (IL-33, an ST2 agonist, has no known antagonist counterpart) and to determine the structure of the IL-33 signaling complex and to engineer extracellular protein-based inhibitors of IL-33; and (3) to define the physical basis of cytoplasmic protein assembly initiated by IL-33 signaling complex formation and to develop intracellular peptide-based IL-33 inhibitors.

IHV Mourns Passing of The Honorable Robert Keith Gray



Dr. Robert Gallo and The Honorable Robert Keith Gray teamed up last year as Dr. Gallo served as Grand Marshal of the 25th anniversary of AIDS Walk Miami.

The Honorable Robert Keith Gray passed away Friday, April 18, 2014 in Miami, Fl. Gray is a longtime friend and supporter of the Institute of Human Virology (IHV), having served on its Board since IHV's inception in 1996. Gray served as Appointments Secretary to President Eisenhower and later held the position of Secretary in the Eisenhower cabinet. In the 1960s and 70s he served as Hill and Knowlton's Washington representative in DC. Among his many other prestigious positions, Bob Gray helped shape Richard Nixon's election and served as deputy director of the Reagan-Bush presidential campaign, and became co-chairman of Reagan's Presidential inauguration. In 1985 Gray took his own firm, Gray and Company public—the first public relations-public affairs firm listed on the NYSE. After selling Hill and Knowlton, a majority interest in the firm, he became its Worldwide Chairman. His most recent company included GrayandCo2, where he served as consultant to international companies and was on numerous boards, including IHV. Gray held a Harvard MBA, four honorary doctorates, and Italy's highest civilian decoration, Grande Ufficiale.

Upon receiving the news, Gray's fellow IHV Board members and close friends commented:

"I will miss him and never forget him as a friend and supporter who gave me and many other medical scientists wonderful memories."

Dr. Robert Gallo

"What a great man. I will miss him."

Steve Wozencraft

"He had a great life. I first met him when he was the chair of the Reagan inaugural."

Jim Pinkerton

"Thanks be to God for the life of Robert Keith Gray."

Jim Jennings

"Bob was so gracious and graceful...as well as being brilliant and kind. I valued his advice and treasured his friendship. Like each of you, I feel his loss. He was an early supporter of Bob [Gallo]...when times were tough. He was strong and full of flint."

Kathleen Kennedy Townsend

"What a blessing he was, for not only IHV, but the USA."

Terry Lierman

"Bob was a fantastic guy. He belonged to a remarkable generation. My own father passed away today at the age of 87 peacefully surrounded by his family. May they rest in peace and enjoy the rewards of the next life."

Tom Lynch

"We do give the most profound thanks for the life of Robert K. Gray. And, as Bob Witeck observed when I told him, 'it is just like Bob Gray to die on Good Friday and he will probably be back with us on Sunday.' I am sure Bob Gray would have appreciated that humor."

Jeff Trammell

"It was a real honor to have served on the IHV Board with Bob Gray."

Sheilah Kast

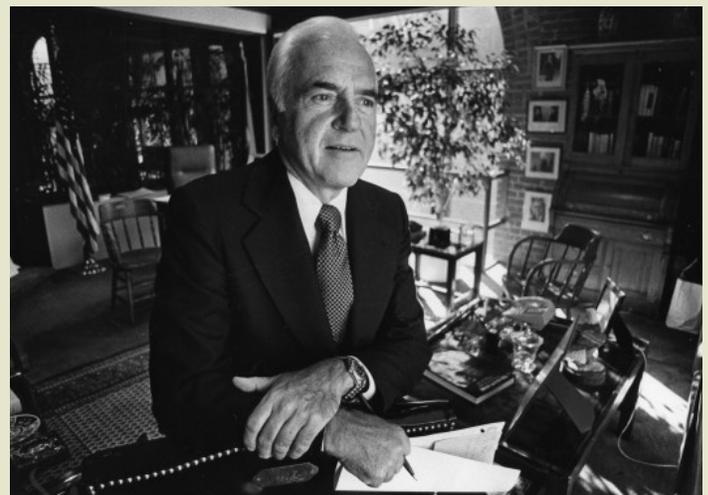


Photo by Ray Lustig/The Washington Post—Bob Gray, seen here in his Gray & Co. office in 1981, was considered one of the most influential lobbyists in Washington. He was "a kind of legend in this town," a Washington Post reporter once wrote in a profile, "the man in the black tuxedo with snow-white hair and a smile like a diamond."



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The Institute of Human Virology is a center of the University of Maryland School of Medicine and is affiliated with the University of Maryland Medical Center.

For more information call 410.706.8614 or visit www.ihv.org

16TH ANNUAL
INTERNATIONAL MEETING of the
Institute of Human Virology
SEPTEMBER 14 –17, 2014 | BALTIMORE
at the Baltimore Sheraton Inner Harbor

IHV continues the tradition of engaging world science leaders to share cutting edge research advances – this year focusing on HIV cure, pathogenesis, basic and translational vaccine research and collective lessons from recent conceptual advances in cancer immunology. In addition to invited presentations, scientific abstract submissions will be accepted for podium and poster presentation.

Baltimore's Inner Harbor

Dr. Robert C. Gallo, Director, Institute of Human Virology

Please visit **WWW.IHV.ORG** for more information on the program, registration and abstract submission.