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# SUNDAY!

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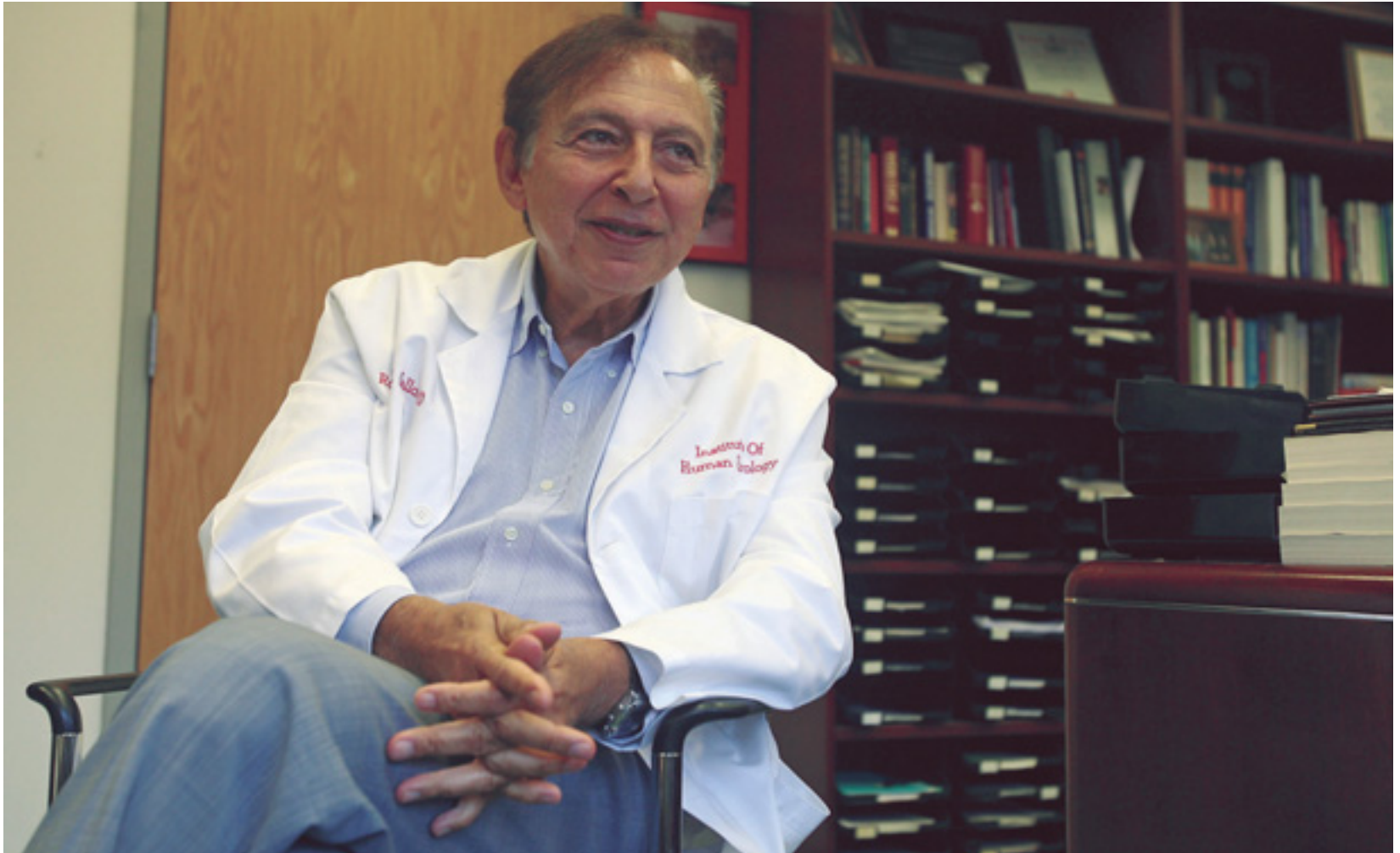
# Nobel pioneer

Dr. Robert Gallo keeps his eye on the real prize — saving lives.

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Digital mammography at Northwest Hospital is advancing the way radiologists detect breast cancer. See page 7.



PHOTOS BY KRISTINE BULS/EXAMINER

Robert Gallo, director of the Institute of Human Virology, continues to search for the vaccine to cure AIDS.

## BIOGRAPHY

### Dr. Robert Charles Gallo

- » **Born:** March 23, 1937, in Waterbury, Conn.
- » **Occupation:** Director of the Institute of Human Virology at the University of Maryland Biotechnology Institute; co-discovered that HIV is the virus that causes AIDS.
- » **Family:** Married with three children.
- » **Education:** Bachelor's degree in biology from Providence College in Rhode Island and medical degree from Jefferson Medical College in Philadelphia
- » **Honors:** Holds 19 honorary doctorates, and has written more than 1,600 papers and the book "Virus Hunting — AIDS, Cancer & the Human Retrovirus: A Story of Scientific Discovery."
- » **Awards:** In 1982, he won the Albert Lasker Award for his work on viral links to cancer. In 1986, he won it again for his work on AIDS. In 1983, he won the American Cancer Society Medal of Honor. In 1985, he won the Armand Hammer Cancer Research Award. In 1988, he won the Japan Prize for Science and Technology. In 1999, he won the Paul Ehrlich and Ludwig Darmstaedter Prize for biomedical research.

By Sara Michael  
Examiner Staff Writer

Dr. Robert Gallo has heard all the stories. That he created HIV to kill people. That he mixed together a bunch of viruses and out popped HIV. That he hasn't even proved the virus exists.

Criticism has clouded Gallo's storied scientific career, as detractors have challenged his findings and his intentions for decades. He was the target of a congressional inquiry in the early '90s. And a bitter 20-year-old dispute between Gallo and the French co-discoverer of HIV, Luc Montagnier, continues to hound him, especially now after Gallo was snubbed for this year's Nobel Prize in Medicine that instead went to Montagnier and fellow French HIV virologist Françoise Barre-Sinoussi. (German scientist Harald zur Hau-

sen shared the prize for his research into cervical cancer.)

Some of it comes from "kooks" or "parasitists" jealous of his success or determined to prove HIV (human immunodeficiency virus) isn't the virus that causes AIDS.

Gallo still hears it, but he shrugs it off.

"You can say what you want," he said recently, sitting in his office in downtown Baltimore. "That stuff I never think about."

Instead Gallo, an intensely dedicated 71-year-old researcher credited with co-discovering that HIV is the virus that causes AIDS, continues to stay acutely focused on finding an HIV vaccine.

"It's never been achieved in vaccinology, a complete blockage of a virus," he said. "But that doesn't mean it's not doable."

# A Nobel cause

*HIV pioneer Robert Gallo takes the high road and stays focused on the job at hand*



Dr. Fabio Romerio isolates white blood cells from HIV-infected blood samples in his lab at the Institute of Human Virology at the University of Maryland.

## An epicenter for AIDS research

Gallo became the founding director of the Institute of Human Virology, a division of the University of Maryland Biotechnology Institute, in 1996, bringing together researchers and epidemiologists in the search for therapies and a vaccine. The institute's annual budget is

\$104 million, and the state provides \$6 million.

There's a reason Gallo and his team chose Baltimore after being courted heavily by several other cities, said Dr. Robert Redfield, IHV's director of clinical care and research.

Baltimore had quickly become an "epicenter" for the AIDS epidemic, Redfield said.

"It is one of the reasons we felt an enormous affinity to come to Baltimore," he said. "All of us felt that if you were going to really build an institute on HIV infection, it seemed more optimal to locate it where there was the epidemic."

Now the Baltimore/Towson metropolitan area ranks No. 2 among American cities in new AIDS cases, and Maryland ranks third among states and territories, according to the Maryland AIDS Administration at the state health department.

Worldwide, 33 million people were living with HIV in 2007, and 2 million died of AIDS, according to the World Health Organization.

### Key retrovirus discovery

When the mysterious disease emerged in the early 1980s, Gallo was studying human retroviruses at the National Cancer Institute, part of the National Institutes of Health, where he spent 30 years and led the Laboratory of Tumor Cell Biology. His interest in science began as a teen, when he lost his 6-year-old sister, Judith, to leukemia.

Gallo is widely credited with being the first to identify a human retrovirus and the only human leukemia virus — discoveries that came at a time in the 1970s when scientists thought viruses didn't cause human cancer and that retroviruses didn't exist. A retrovirus is a pathogen that contains RNA rather than DNA and copies its genome into the DNA of a host cell.

This was "by far a more difficult discovery" than his work identifying HIV as the virus that causes AIDS, and it took much longer to prove, he said.

It also doesn't get as much attention. In fact, Gallo has made several major discoveries in his career, mostly overshadowed by the accomplishments and controversies surrounding HIV.

He also discovered interleukin-2, an immune system molecule that stimulates the growth of T-cells, which was later critical for the discovery of HIV because it allowed the virus to grow.

Gallo was ridiculed for his retrovirus finding, because most scientists didn't think human retroviruses existed, but it was critical in paving the way for later HIV discoveries, said IHV co-director Dr. William Blattner, head of the epidemiology and prevention division.

"Were it not for that discovery, no one would have believed a human retrovirus could be considered as a cause of AIDS," he said. "It immediately put retroviruses into the mix."

By 1981, when Gallo heard about AIDS, scientists already were thinking a virus could be the cause, Gallo said in a 2002 paper written for the journal *Science*.

So began the race to find the culprit and stop a disease quickly spreading among gay men and hemophiliacs.

Data began to accumulate little by little, Gallo said, until 1984, when he and his team at NCI realized they had discovered HIV was the cause of AIDS.

"That was a very happy moment," Gallo said. "You knew how fast it was going to be accepted."

Gallo went on to develop the AIDS blood test, which allowed officials to screen for the virus and protect the blood supply, and published papers in the spring of 1984 detailing his discoveries.

Meanwhile, Montagnier, a scientist at the Pasteur Institute, was also pursuing the cause. In May 1983, he and his team published a paper in *Science* saying they had isolated a virus found in a patient who died of AIDS, but they couldn't prove that it was the cause.



Robert Gallo, chief of the National Cancer Institute Laboratory of Tumor Cell Biology, announces in April 1984 that HIV was the probable cause of AIDS.

New evidence continued to emerge, but "the tide only turned in France when Robert Gallo and his group in the United States made a similar discovery," Montagnier wrote in a 2002 *Science* paper that accompanied Gallo's essay.

"In the spring of 1984, Gallo published more convincing evidence that HIV causes AIDS," Montagnier wrote.

### Money talks

But a bitter battle was unfolding, because big money was at stake from royalties from the patent on the blood test.

Gallo endured what Blattner called a "rough-and-tumble character assassination" from politicians.

The U.S. and French governments settled the dispute in a 1987 agreement to share the millions of dollars in royalties, but the deal was later renegotiated to give the French a larger share.

Both scientists have said the dispute was settled 20 years ago.

But it reignited last week, as Montagnier and Barre-Sinoussi were awarded the Nobel Prize for their discovery of the AIDS virus. Montagnier was quoted as saying Gallo also deserved recognition.

Gallo was quoted as saying he was "disappointed," but in a congratulatory statement after the announcement, he said, "I am pleased that the Nobel Committee chose to recognize the importance of AIDS with these awards, and I

led by Gallo's former friend and colleague Peter Duesberg.

Duesberg, now a biochemistry and molecular biology professor at the University of California at Berkeley, made the claim in 1987, saying there is no epidemiological evidence to support the theory that HIV causes AIDS. As a retrovirus, HIV couldn't be the cause, he said, because retroviruses don't kill the host, as happens with AIDS.

Duesberg has picked up a following, but many in the scientific community have treated him as a pariah, and his funding has been cut off.

Science is fallible, Duesberg said, and Gallo and other scientists should have considered alternative explanations because too many questions about HIV remain.

But there was pressure to find a cause, and the HIV explanation has been accepted, Duesberg said.

"Bob is too deep into it to get out of it again," he said.

If Gallo was right, he said, a vaccine would have been developed by now, and the Nobel Prize would have been awarded 15 years ago.

"Nothing is more political than AIDS," he said.

Gallo described his former friend as an "interesting fellow" with a "fixed obsession."

In response to the claim that HIV isn't the cause, Gallo said simply: "There is more evidence that this virus causes AIDS than there is of any cause of any human disease."

### A push toward a vaccine

Gallo never has shied away from the complex or the controversial, and his approach to a vaccine is no different.

The prevailing scientific dogma has been approaching the vaccine as a cellular mechanism, which essentially kills cells after they are infected, rather than as an antibody that catches the virus before it makes it into the cells, said Blattner, who has collaborated with Gallo since 1974.

"A research track he has been pursuing for 10 years is starting to come to fruition, which grows out of the belief that an effective vaccine has to stop the enemy at the gate," Blattner said.

If the virus isn't caught early, before it invades the cell, the "damage is significant," he added.

Vaccine trials have failed because the approach is flawed, Gallo said.

"I don't think they have been science-based [or] evidence-based," he said.

Researchers have yet to solve the problem of keeping the vaccine constant, continuing to respond to the spreading virus, but Gallo remains hopeful that safety trials could begin next year or in 2010.

Just as Gallo was ridiculed for his finding of the first human retrovirus, he too has been ridiculed for his notion that a vaccine can be developed that stops HIV "at the gate," Blattner said.

"He has the ability to transcend public opinion and dogma and go for an answer that is more significant because it takes so long to get there," Blattner said. "When you challenge dogma you make enemies."

smichael@baltimoreexaminer.com

### HIV/AIDS in Maryland

- » 1,022 new HIV cases in Baltimore City
- » 2,144 new HIV cases in Maryland
- » 15,984 people living with HIV/AIDS in Baltimore
- » 32,811 people living with HIV/AIDS in Maryland
- » The Baltimore/Towson area ranked second among metropolitan areas in the rate of AIDS cases reported in 2006, behind Miami.
- » Maryland ranked third among states and territories in the rate of AIDS cases reported in 2006, behind the District of Columbia and the Virgin Islands.

SOURCE: 2006 DATA, MARYLAND AIDS ADMINISTRATION

am proud that my colleagues and I continue to search for an AIDS vaccine."

National Cancer Institute Director Dr. John Niederhuber said in a statement he was "extremely disappointed that the NCI and all of the resources it brought to bear on the discovery of the AIDS virus — along with the technology to make blood banking safe and the drugs that have made AIDS a chronic disease — weren't, in some fashion, recognized."

Controversy also has continued from scientists and others often called "denialists," who are not convinced HIV causes AIDS, a charge

## Md. doctors move to make HIV screening a routine test

By Sara Michael  
Examiner Staff Writer

Dr. Robert Redfield thinks an HIV test should be as routine as any other test when a patient is admitted for care.

"One of the most important tools we have to confront an infectious disease is knowledge of infection," said Redfield, the director of clinical care and research at the Institute of Human Virology, part of the University of Maryland Biotechnology Institute.

For years, patients have had to ask for an HIV test, rather than opt out of one, meaning fewer people are getting testing, and fewer people know whether they are infected.

"If you don't know you have it, you can't be treated, and you can spread it," said Dr. William Blattner, IHV's director of epidemiology and prevention division.

This concept of early diagnosis is beginning to catch on, and being an "epicenter" for the disease, Maryland has an opportunity to encourage it, Redfield said. "There is an opportunity for the medical community to strengthen the leadership."

The catch has been that the law has required patients to fill out separate consent forms and undergo lengthy counseling when getting a test. But that's changing, said Meena Abraham, director of public health and physician quality programs at MedChi, the Maryland State Medical Society, which advocates for physicians.

Last year, state lawmakers passed a law removing some of the barriers for physicians to begin routine HIV testing, such as separate consent forms, Abraham said.

"If you had a separate written form of consent and counseling, then you are making it very burdensome on the physician to test people," she said.

Now, the organization is working to educate doctors on the change and the level of information and support they need to provide patients, she said.

It's going to take awhile to achieve routine testing, Abraham said, but the law change was "huge progress."

smichael@baltimoreexaminer.com