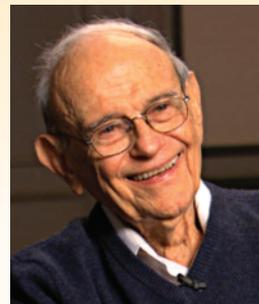


## Herman N. Eisen, M.D., AAI '51

(1918–2014)

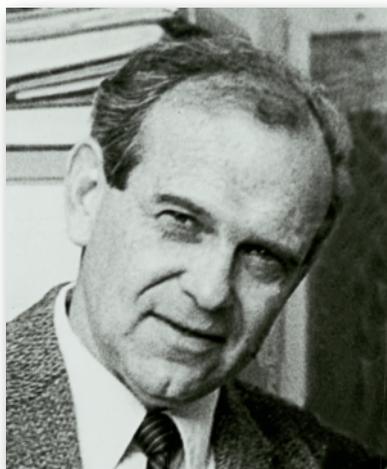
*“I’ve always enjoyed seeing medicine as an outsider and following it, but I enjoy science more... The kind of science I enjoy is dispelling ambiguities. I can’t stand ambiguity. Getting insight to a problem can be pretty rewarding.”*

Herman Eisen, AAI Oral History Project interview (May 4, 2012)



AAI extends condolences to the family, friends, and colleagues of renowned immunologist and past AAI president Herman N. Eisen, M.D., AAI '51, who died on November 2 at the age of 96. He was the oldest and second-longest tenured AAI member at the time of his death.

An emeritus professor of biology at Massachusetts Institute of Technology (MIT), whose active research career spanned six decades and extended to the end of his life, Dr. Eisen is perhaps best known for groundbreaking research in which he described affinity maturation, the immune system’s ability to adjust antibody production to better identify and neutralize invading pathogens after infection.



Herman Eisen

The recipient of the AAI Lifetime Achievement Award (1997) and AAI Behring Heidelberger Award (1993), Eisen was a member of the AAI Council from 1964 to 1971, including as AAI president from 1968 to 1969. He served on the AAI Awards Committee and AAI Nominating Committee (including as chair of both) and on additional AAI bodies, including the Blue Ribbon Panel, Committee for Liaison with DRG [Division of Research Grants, National Institutes of Health (NIH)], Liaison Committee with Research Granting Agencies, and Long Range Planning Committee (chair). He was a member of the editorial board of *The Journal of Immunology* and served as AAI representative to the board of the Federation of American Societies for Experimental Biology.

For highlights of his AAI service and career achievements and to view Dr. Eisen’s 2012 interview for the AAI Oral History Project, visit [www.aai.org/About/History/Notable\\_Members/Presidents/Eisen\\_Herman.html](http://www.aai.org/About/History/Notable_Members/Presidents/Eisen_Herman.html).

Eisen was a member of the National Academy of Sciences and the Institute of Medicine of the National Academies and a fellow of the American Academy of Arts and Sciences.

The following tribute was published by MIT and appears with the kind permission of that institution.

### Herman Eisen, Professor Emeritus of Biology, Dies at 96

Eisen was a pioneering immunologist and longstanding member of MIT’s cancer research community.

Kevin Leonardi, Koch Institute  
November 13, 2014

Herman Eisen, a professor emeritus of biology and founding member of the MIT Center for Cancer Research, died November 2 at age 96.

Over a 70-year career, Eisen forged a path as a pioneering immunologist whose research has significantly shaped the field. He joined the MIT faculty in 1973, having been recruited as a founding member of MIT’s Center for Cancer Research (now the Koch Institute for Integrative Cancer Research).

Eisen retired from MIT in 1989, albeit only in the official sense: As a professor emeritus, he maintained an active laboratory and continued to research, publish, and advise students and postdocs until his passing. In all, Eisen spent 41 years at MIT, during which he taught, mentored, and collaborated with thousands of students, faculty members, and staff.

### Early years

Born in 1918 in Brooklyn, New York, Eisen developed a keen interest in science at an early age, when a high school chemistry class helped frame his perception of the world as a collection of atoms and molecules. Eisen began premedical studies at New York University (NYU) in 1934, but halfway through his undergraduate career he needed to

## Herman N. Eisen, M.D., AAI '51 *(continued)*

(1918–2014)

leave school — and his position as first baseman on NYU's baseball team — after developing tuberculosis. Though Eisen's TB kept him out of school for one year, the illness sparked a curiosity about the immune system that would endure for the rest of his life.

Eisen returned to NYU to complete his bachelor's degree, and he then enrolled at the university's medical school. He graduated with an M.D. in 1943 and then worked as an assistant in the pathology department at the Columbia University College of Physicians and Surgeons before going back to NYU for his residency.

Eisen had a strong interest in basic science research, particularly in trying to better understand the body's immune system. Though career options for physician-scientists had historically been limited, the federal government began to increase its funding of biomedical research through the National Institutes of Health (NIH) following World War II. Seizing these new opportunities, Eisen became one of the first recipients of an NIH fellowship, which supported his research on sulfonamide-induced antibodies at NYU. These investigations helped him and colleague Fred Karush to determine the number of antigen-binding sites on antibodies.

After his two-year NIH fellowship, Eisen worked briefly at the Sloan Kettering Institute before returning once again to NYU as a faculty member. Inspired by the work of his recently deceased role model, physician-scientist Karl Landsteiner, he studied immune reactions of the skin. In doing so, he clarified the basis for certain allergic responses and showed that only those chemicals capable of forming covalent bonds to skin proteins could cause a characteristic itchy rash.

In 1955, Washington University in St. Louis (WUSTL) recruited Eisen to join the faculty of its School of Medicine. There, he served as dermatologist-in-chief for five years before moving to the Department of Microbiology to serve as chair. While at WUSTL, Eisen published groundbreaking research in which he described affinity maturation: the process by which activated B cells produce antibodies with an increasingly higher affinity for invading pathogens after infection. This process is fundamental to the development of potent immune responses.

"Our understanding of affinity maturation begins with Herman's papers," says Arup K. Chakraborty, director of MIT's Institute for Medical Engineering and Science and the Robert T. Haslam Professor in Chemical Engineering,

Physics, Chemistry, and Biological Engineering.

"Understanding this evolutionary process is critical for vaccine design, and affinity maturation is also mimicked in countless academic laboratories and companies to design antibody-based therapies."

### Joining the MIT cancer research community

In response to the signing of the National Cancer Act of 1971, MIT tasked Nobel Prize-winning biology professor Salvador Luria with establishing and leading a new MIT Center for Cancer Research. Wanting to include cancer immunology as a focus of this new center, Luria approached Eisen about joining as a founding faculty member. Eisen accepted the role, and arrived at MIT in 1973 as a professor in the Department of Biology.

Eisen brought his immunology expertise to MIT's new cancer center to study how cancer cells evade the body's natural immune response. Much of his work focused on studying myeloma tumors in mice and screening their associated proteins. He found that if he used myeloma proteins from one mouse to immunize other mice from the same strain, they were resistant when challenged with cancer cells.

Eisen and his laboratory went on to study how CD8 T cells develop into cytotoxic, or "killer," T cells and long-lived memory T cells. Therapeutic vaccines that exploit CD8 responses have not yet been developed for human populations; existing immunotherapies rely on helper T cells and other immune cells, and they do not mount the same aggressive offense against targets. Eisen was working to understand and overcome the barriers to creating effective CD8 vaccines, and his research on the subject was of particular importance to the advancement of cancer immunology. As part of this research, Eisen collaborated closely with Koch Institute faculty members Jianzhu Chen and Richard Young, who is also a member of the Whitehead Institute.

"Herman's lifelong pursuit of science, even to the very last day of his life, has been an inspiration to many of us," says Chen, the Ivan R. Cottrell Professor of Immunology. "He was a great human being with a great attitude and a clear mind. He will be missed greatly."

As a fixture of MIT's cancer research community since its formal inception, Eisen could, in recent years, often be found in his second-floor Koch Institute office consulting with students and younger investigators.

“Herman was a true treasure: an inspiring colleague, a caring mentor, and a wonderful human being,” says Tyler Jacks, director of the Koch Institute and the David H. Koch Professor of Biology. “We all aspire to be Herman Eisen.”

Other colleagues remember Eisen not only as a groundbreaking immunologist but also as a hardworking collaborator and a generous man of integrity. He continued to be an active scientist and had been working with Chakraborty on a paper until his passing.

“Herman was a giant in the field of immunology, with many seminal discoveries,” Chakraborty says. “He was also the kindest and most generous and moral person I have known. Until the end, he was working on scientific problems with junior colleagues and students who benefited from his wisdom. I am lucky to have worked with this great scientist and wonderful human being.”

“Herman was a wonderful colleague and a terrific person with the highest integrity — a true mensch,” adds Alan Grossman, the Praecis Professor of Biology and head of MIT’s biology department. “We will miss his wisdom, thoughtfulness, and vitality.”

Eisen was elected to the American Academy of Arts and Sciences in 1965, the National Academy of Sciences in 1969, and the Institute of Medicine of the National Academies in 1974. He received numerous other awards and honors throughout his career, including the Behring-Heidelberger Award from The American Association of Immunologists, an Outstanding Investigator Award from the National Cancer Institute, and the Lifetime Service Award from The American Association of Immunologists, of which he served as president from 1968 to 1969.

Eisen is survived by his wife Natalie; their children, Ellen, Jane, Jim, Tom, and Matthew; and 12 grandchildren.

*Memorial donations may be made to the Marine Biological Laboratory (connect.mbl.edu/donate) in Woods Hole, Massachusetts.*

*See also: Michael C. Purdy, “Obituary: Herman Eisen, 96, former head of molecular microbiology,” Newsroom, November 13, 2014, Washington University in St. Louis, <https://news.wustl.edu/news/Pages/27687.aspx>*

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Seattle, Washington

# 2017



IMMUNOLOGY 2017™  
May 12–16  
Washington, D.C.