Wistarabilia

125 years of research achievements and improving human health

125 YEARS
THE WISTAR INSTITUTE

Wistarabilia

The legacy of The Wistar Institute started with two immigrant brothers, Caspar and Johannes Wüster, who arrived in Philadelphia in pursuit of tolerance and opportunity. Like their new neighbors, they strived for their success and to create the world they envisioned.

Grandson Caspar Wistar—whose last words were "I wish well to all mankind"—lived his life as a testament to improving the lives of his fellow citizens. It was in his name that these ideals were carried on by Isaac Wistar, whose far-reaching vision of establishing an institution of "seekers after a new and original knowledge" would be embodied in the work of The Wistar Institute. Neither of these men could have possibly envisioned the type of work their legacy continues to inspire 125 years later. And yet, they live on in the groundbreaking research aimed at improving the health of all mankind.

Established in 1892, The Wistar Institute is the first independent nonprofit biomedical research institute in the United States. The Institute has held the prestigious Cancer Center designation from the National Cancer Institute since 1972 and is one of only seven basic research cancer centers in the country. Wistar science focuses on cancer research and vaccine development for infectious diseases. Our discoveries in these fields have helped save millions of lives globally. Collectively, Wistar researchers author an average of 150 peer-reviewed scientific publications each year in the world's top-tier journals. Our scientists work to ensure that research advances move from the laboratory to the clinic as quickly as possible. We are proud of our rich history of pushing the boundaries of scientific research and discovery to impact human health.

This 125th anniversary edition of *Wistarabilia* is dedicated to the countless individuals, past and present, who have generously given their expertise, devotion, and resources to The Wistar Institute—the leadership, scientists, administrative staff, Board of Trustees, philanthropists, and the Wistar family—all whose names are far too numerous to mention individually. It is through the efforts of each of these individuals that the mission of The Wistar Institute has been, and will continue to be fulfilled.

mission statement

The mission of The Wistar Institute is to marshal the talents of outstanding scientists through a highly-enabled culture of biomedical collaboration and innovation, in order to solve some of the world's most challenging and important problems in the fields of cancer, immunology, and infectious diseases, and produce groundbreaking advances in world health. Consistent with a pioneering legacy of leadership in not-for-profit biomedical research and a track record of life-saving contributions in immunology and cell biology, The Wistar Institute aims to pursue novel and courageous research paths to life science discovery, and to accelerate/potentiate the impact of those discoveries by shortening the path from bench to bedside.


BAR

The City

At Home in Philadelphia

Before Philadelphia was a city, it was a vision. William Penn traveled Europe espousing the ideals of religious freedom and political democracy as he sold the dream of the *City of Brotherly Love* to potential settlers of his Pennsylvania colony. This notion of freedom brought about an emphasis on the intellectual, scientific, and cultural life, in which reason was considered as the primary source for legitimacy and authority.

Learned men believed in the free exchange of ideas and the circulation of knowledge for the betterment of society. Philadelphia was home to the first institution devoted to natural science in North America (the American Philosophical Society), the first public institution in America (The Library Company of Philadelphia), the first public school in the American colonies, the first botanical garden, the first hospital, the first fire company, the first insurance company (the Philadelphia

Courtesy of U.S. National Archives.

Contributionship), the first medical school, the first medical society (including establishing the American Medical Society), the first Anti-Slavery Society, and the Society for Inoculating the Poor (against small-pox disease). All were established before the colonies declared independence.

The dimensions of knowledge in the 18th century—especially natural philosophy and the study of nature—comprised of the kinds of investigations now considered scientific and technological. By the mid-19th century, Philadelphia was home to a College of Pharmacy, a steam works building, the first horticultural society, the largest locomotive building works factory, a systematic study of meteorology, and the first American zoo. Of course, it was here in Philadelphia that The Wistar Institute of Anatomy and Biology—the first of its kind—would be founded in 1892.

The Family

The Wüster Family in America

"[The] career of the Wistars and Wisters has been a continuous adventure, a story of heroic men and gracious ladies, of philanthropists and scholars, of soldiers and authors, and of men and women with strong convictions of duty to their country and their community."

—Milton Rubincam

The Wüster family's story in America starts with Caspar Wistar (1696-1752). Arriving in Philadelphia on September 16, 1717, he was one of the earliest German colonists in Pennsylvania. By adopting the dominant Quaker faith, Caspar accessed significant connections that allowed him to become a mediator for the ever-growing German-speaking immigrant population. He is often referred to as a brass button-maker, especially as the "Philadelphia" buttons he made became famous throughout the colonies for their durability. But ultimately he was a merchant who created a network for culturally specific merchandise he imported from Europe, along with other items he modified for the American market. His understanding of these markets led him to establish a successful glass manufactory (1739) in nearby Salem County, New Jersey. Wistarburgh Glass Works (United Glass Company) became the first commercially successful glass factory in America. He helped negotiate land deals for new immigrants and through land speculation would himself become owner of numerous "plantations" and land tracks. Caspar's younger brother Johannes (1708-1789) arrived in 1727 to join the family business. While Caspar's name had been anglicized to Wistar, Johannes Wüster became John Wister. Residing and working in Old City (currently 3rd and Market Streets), the Wüster brothers established and lived the American Dream. By Caspar's death in 1752, he had amassed one of the greatest fortunes of the period. The Wüster family tree—whether Wistar or Wister—represents noteworthy contributions to 300 years of Philadelphia history, including involvement in a significant number of "Philadelphia firsts." Among these firsts was the opening of the first independent biomedical research center in the nation: The Wistar Institute, for which Caspar Wistar's grandson Caspar Wistar, M.D., is the namesake.

Wistar family photo, circa 1856.

What's in a Name?

They all unite in dropping the U
As the very best thing that they could do.
But the question is much more important, you see,
When one has to decide 'twixt an A and an E.

And so we have them all by the ears
Each branch its own little letter reveres,
And a heartless world goes on just the same
No matter how they spell their name.

—*Susan Stephenson*
(Wistar family descendant) 1885

More Family Firsts

SALLY WISTER
1706-1804

She is known for her published diary, which she kept during the American Revolution. The diary is a firsthand report of life during the British occupation of Philadelphia in 1777-1778.

THOMAS WISTAR
1798-1876

He was active in Indian affairs and was appointed as an Indian commissioner in 1841. According to his obituary in the Philadelphia Evening Bulletin, the Indians Thomas visited named him "man with a tear in his eye."

OWEN WISTER
1860-1938

He is considered the "father" of western fiction, best known for writing *The Virginian* and a biography of Ulysses S. Grant.

FRANCES ANNE WISTER
1874-1956

She was a pioneering preservationist and the founding matriarch of The Philadelphia Society for the Preservation of Landmarks. She helped protect Independence Hall from demolition through the establishment of the Independence National Historic Park.

The Family

A Family of Natural Philosophers

CHARLES JONES WISTER
(1782-1865)

He was an amateur scientist and respected patron of local scientists. As a member of the "Twilight Club," he met fellow members at the close of business to discuss questions of the day, including science and literature. This group would help form the Academy of Natural Sciences in 1815. Charles kept a pioneering weather diary, which is still referenced today, and built an observatory at his summer home Grumblethorpe.

WILLIAM WYNN WISTER
(1807-1898)

He was a botanist who developed a valuable herbarium, and with his brother **CJ Wister Jr.** (1822-1910) he further developed the family's Germantown gardens, including the Wister Woods. CJ Jr. was one of the earliest experimenters in Philadelphia with the daguerreotype process of photography.

JOHN CASPAR WISTER
(1887-1982)

He is one of the country's most honored horticulturalists.

Daguerreotype photo taken in 1858 by CJ Wister Jr., at Grumblethorpe, showing the observatory (that later burned down). CJ's photos are some of the earliest of Germantown starting in about 1840. Courtesy of the American Philosophical Society.

Wisteria Mysteria

When English botanist Thomas Nuttall (1786-1859) named the American wisteria plant, he left behind a bit of a mystery. While some believe Nuttall named the plant in honor of Dr. Wistar (1761-1818), others point out the name might lead to the Wister side of the family tree, as he spelled it wisteria and not wistaria. Nuttall was well-acquainted with Dr. Wistar through the American Philosophical Society (APS) and other Philadelphia scientific institutions. Dr. Wistar's cousin Charles Jones Wister, also a member of APS, was known to be an ardent student of botany and an authority on the local flora. Some speculate it was his influence that led to the naming. Nuttall himself never had an answer when asked about his chosen spelling. Perhaps it doesn't matter, but it is safe to say that American wisteria was named after the American Wüster family.

Family Properties

Of all the properties owned by the earlier generations, sadly, none of the "Old City" properties around 3rd and Market Streets survived the constant redevelopment of the area. There are, however, two significant properties in the Germantown section of Philadelphia that still stand today in testament to the lives of this extraordinary family. Both are open to the public as house museums and are part of a significant collection of historic sites that make up Historic Germantown, which was traditionally a summer refuge for the Quakers of Philadelphia. Both properties serve the surrounding community with educational programming and services.

WYCK
6026 GERMANTOWN AVENUE

The property was originally owned by Swiss-German immigrant Hans Milan in the 1690s. It came into the Wistar family when Milan's granddaughter Catherine Jansen married Caspar (the elder) in 1726. The Wistars would enjoy the house as a summer refuge. It officially became a historic site in 1973.

Courtesy of The Wyck Association, photo credit: Robert Buzzard Photography.

GRUMBLETHORPE
5267 GERMANTOWN AVENUE

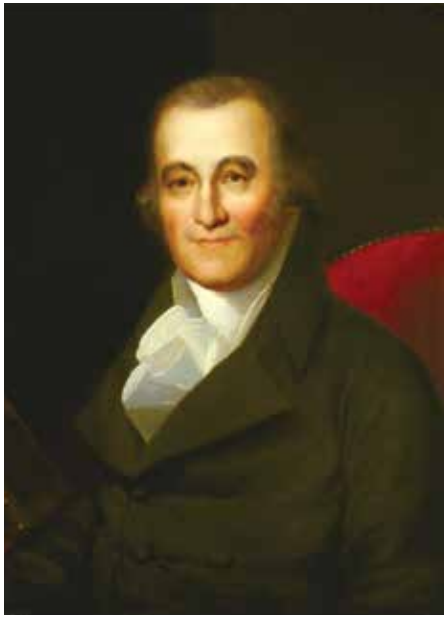
Caspar's brother John built his own Germantown refuge in 1744, originally known as "John Wister's Big House." John's grandson Charles Jones Wister renamed the property Grumblethorpe after hearing the name in a book published in Philadelphia in 1824 entitled "Thinks I To Myself: A Serio-Ludicro, Tragico-Comico Tale." In 1940, the house was donated to the Philadelphia Society for the Preservation of Landmarks, which still owns and operates it.

The Grumblethorpe garden features a massive fruiting Ginkgo tree reputed to have been grown from a seedling brought from England in 1754. This tree is thought to be one of the oldest in existence in America.

Courtesy of PhilaLandmarks.org.

The Namesake

Caspar Wistar, M.D. *(1761-1818)*



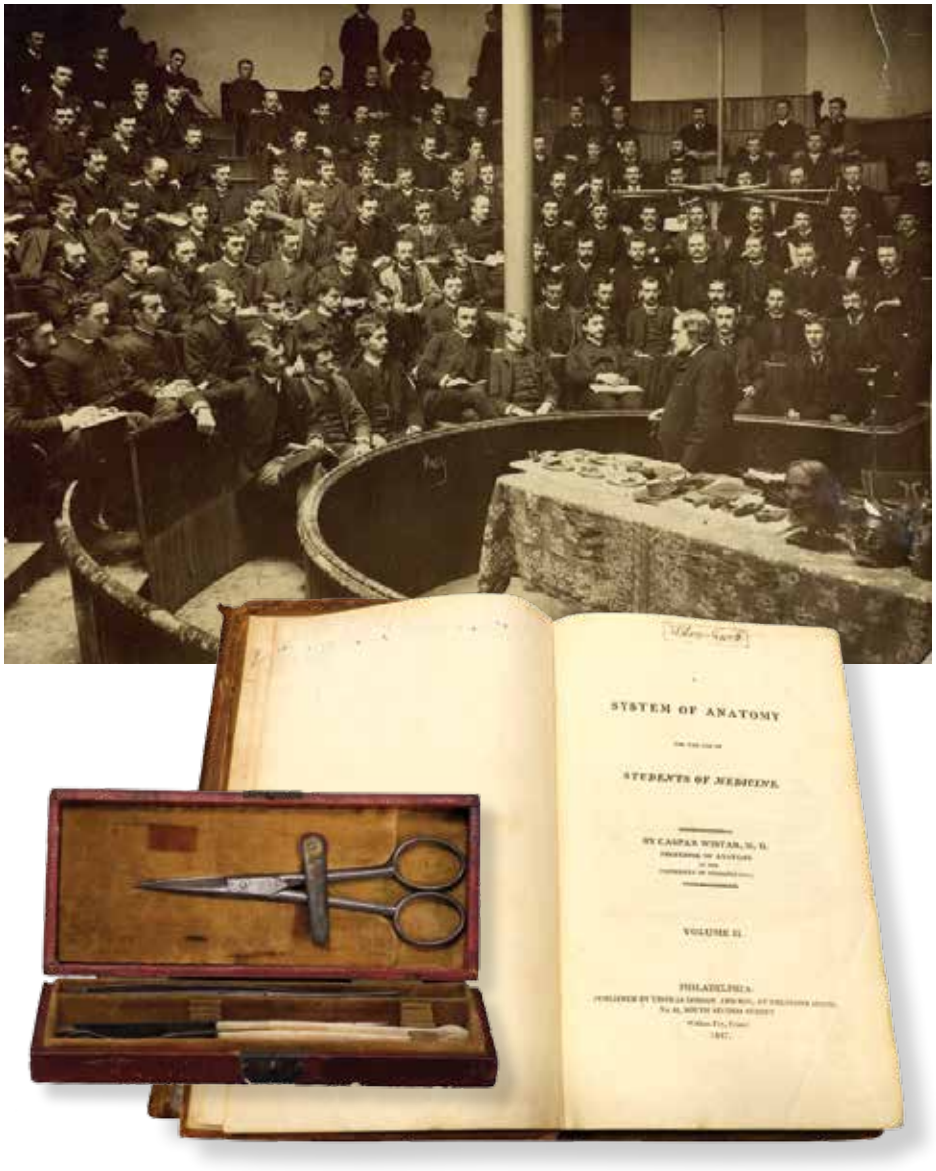
Portrait of Caspar Wistar, M.D. by Bass Otis, 1817.

"I wish well to all mankind."

—Caspar's last words on January 18, 1818.

Dr. Wistar followed quite a different path, studying medicine first at the University of Pennsylvania and then at the University of Edinburgh (1786). Dr. Wistar was an attending physician at the Philadelphia Dispensary in 1786, and a physician at the Pennsylvania Hospital from 1793 to 1810. In 1809, he founded the Society for Circulating the Benefit of Vaccination, which vaccinated over 1,100 individuals in its first year. Dr. Wistar served as curator and vice president of the American Philosophical Society before succeeding Thomas Jefferson as president of the society. He was a fellow of the College of Physicians and a trustee of the College of Philadelphia. He also belonged to the Pennsylvania Prison Society, the Humane Society, and the Society for the Abolition of Slavery of which he served as president.

Dr. Wistar became a professor of chemistry at the College of Philadelphia in 1789 and a professor of anatomy at the University of Pennsylvania in 1792. His popular anatomy lectures drew large crowds of medical students from around the world. Around 1808, Wistar commissioned prominent American sculptor William Rush to construct three-dimensional, larger-than-life-sized anatomical models for his students to better see during anatomy lessons held in vast amphitheaters. Rush sculpted 21 models in wood and papier-mâché, of which seven survive today in The Wistar Institute collection and three are on permanent display. At the time, most anatomy textbooks came from Europe. Between 1811 and 1814 Dr. Wistar authored two volumes of *A System of Anatomy for the Use of Students of Medicine*, considered the first American anatomy textbook.

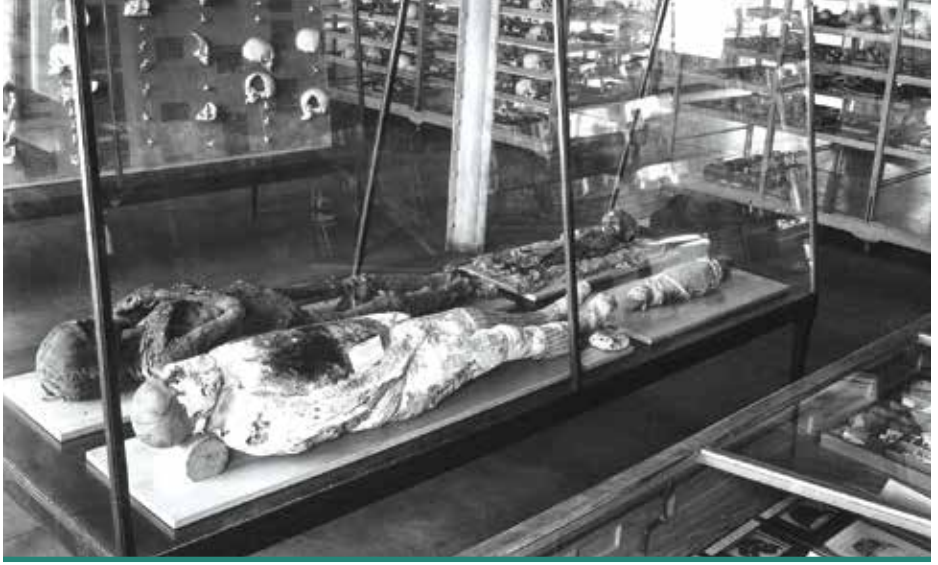


Joseph Leidy, M.D., Chair of Anatomy, lecturing to University of Pennsylvania class of 1887 using specimens and aids; photo courtesy of the University of Pennsylvania Archives. Dissection kit used by Dr. Wistar. "A System of Anatomy for the Use of Students of Medicine," 1817.

Anatomical models sculpted by William Rush, circa 1808, photographed by Candace diCarlo: sphenoid bone; temporal bone with labyrinth of the inner ear; eye.

The Namesake

The Wistar and Horner Museum



Museum display case: in the foreground, the "Soap man", saponified body remains presented by Joseph Leidy, M.D., to the Wistar and Horner Museum collection at the University of Pennsylvania in 1875 and exhibited at Wistar until 1958, when the body was transferred to the Smithsonian Institution in Washington, D.C.

Through the years Dr. Wistar built an immense collection of custom-made anatomical preparations and models, including organs injected with mercury or wax, bones and skeletal preparations, and vascular corrosion casts. Besides the human models, the Wistar collection included preparations of animal tissues, which he used for the study of comparative anatomy. Prior to his death, Dr. Wistar appointed William Edmonds Horner, M.D., as custodian of the collection, which also included the Rush models and other preparations he had acquired from the famous Italian anatomist Paolo Mascagni. Later, as dean and professor of anatomy at the University of Pennsylvania Medical School, Dr. Horner would enlarge the collection with his own vast selection of skeletal materials and skulls. The collection became known as the Wistar and Horner Museum and was left to the university upon Dr. Horner's death in 1853. Under the direction of Joseph Leidy, M.D., the collection was further expanded with hundreds of anatomical, botanical, and animal specimens, but by 1890 it was in sad shape after years of use and a serious fire. Dr. Wistar's prosperous great-nephew, Isaac J. Wistar, was approached by Penn provost William Pepper, M.D., for a donation to help revitalize the Wistar and Horner Museum.

Handmade Plössl microscope used by Dr. Horner, on display at the Institute; wax-injected heart.

The Shippen-Wistar House, Southwest corner of 4th Street and Prune Street (now Locust Street). The house was built in 1765 for William Shippen, M.D., a leading physician of the time, and bought by Dr. Wistar in 1798. Photo, circa 1859, courtesy of the Free Library of Philadelphia.

The Wistar Parties

Caspar was known for the weekly "intellectual banquets" he hosted at this home on 4th Street in Philadelphia. The guests were drawn to the Wistar home for the company, which included a mix of students, scientists, local literati, and distinguished foreign guests. The house still stands today, with some architectural alterations.

"No man can say a harsh thing with his mouth full of turkey."

—Wistar Party Guest

The Wistars and the Historic Personalities of their Time

BENJAMIN FRANKLIN

The Wüster brothers Caspar and John initiated a long-standing tradition of supporting the sciences by the Wistar/Wister family. It was Caspar's glass globes that Ben Franklin used in his electrostatic machines for his famous electrical experiments. And it was in one of John's properties on High Street (present day Market Street) that Franklin installed his first lightening rod. Family legacy is that when John's son Daniel later moved his family into the house he discovered bells in his bedroom wired to the rod on the roof: whenever a storm passed overhead, the bells would come to life. The Wistar and Franklin families would formally join when Caspar's granddaughter Catherine (sister of Dr. Wistar) married Franklin's grandson, William Bache, M.D., in 1797.

THOMAS JEFFERSON

Dr. Wistar and Thomas Jefferson were personal friends and involved in common intellectual and civil endeavors. Dr. Wistar was elected president of the American Philosophical Society after Jefferson's resignation in 1815. They worked together on several scientific projects, the most famous of which was the identification of the fossil bone remains of the Megalonyx, an extinct giant ground sloth native to North America. On this subject, Dr. Wistar published the first comparative study of vertebrate fossils in America and his work would provide a foundation for paleontology in the United States.

MERIWETHER LEWIS

Following Thomas Jefferson's recommendation, Lewis consulted with Dr. Wistar while preparing for the famous Lewis and Clark expedition. Dr. Wistar, who was considered an authority in paleontology, tutored the explorer on the fossils and new species he might possibly encounter in the Midwest.

BENJAMIN RUSH

Dr. Wistar succeeded Benjamin Rush, M.D., as president of the Society for the Abolition of Slavery and as a professor of chemistry at the University of Pennsylvania. During the Philadelphia yellow fever epidemic of 1793, Dr. Wistar remained in the city and gave Dr. Rush aid and support. Later, he opposed Dr. Rush's extreme treatment methods based on bloodletting and purging and in doing so lost his friendship.

Drawings of the Megalonyx jeffersonii bones by Titian Peale, which illustrated Wistar's report in Transactions of the American Philosophical Society, 1799. Courtesy of the American Philosophical Society.

A Piece of History

THE WISTAR FAMILY ARTIFACTS COLLECTION

Besides the unique wealth of scientific history, The Wistar Institute also conserves a rich collection of Wistar family artifacts that constitute an important piece of the history of the region and the nation. The collection includes Civil War paraphernalia that once belonged to General Isaac J. Wistar, Dr. Wistar's dissection tools, Dr. Horner's microscope, Wistar family artifacts and utensils, colonial currency, historic books, letters, portraits, and sculptures.

Above, colonial currency belonging to the Wistar family.

Photo of the Wistar brigade, circa 1863; Brigadier General Isaac J. Wistar's pistol and sword used during the Civil War; traveling cellaret brought to the Pennsylvania colony from Germany by Caspar (the elder) in 1717; Dr. Wistar's dissection tools.

The Founder

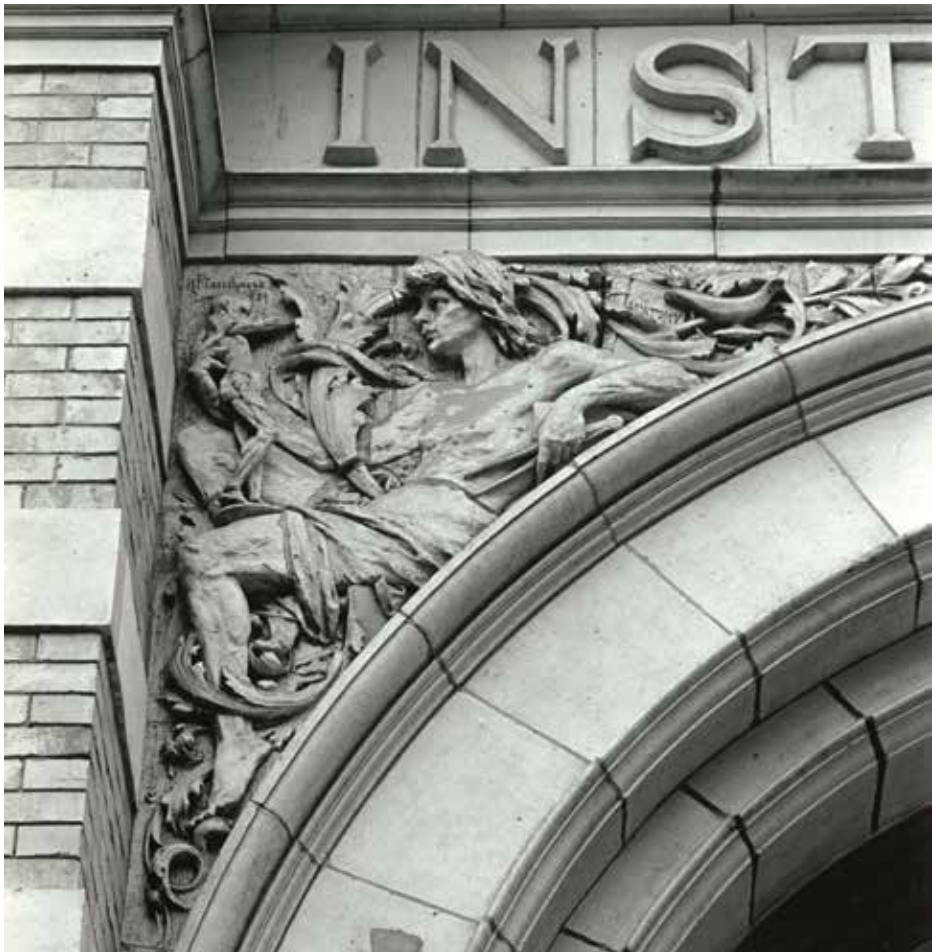
Isaac Jones Wistar
(1827-1905)

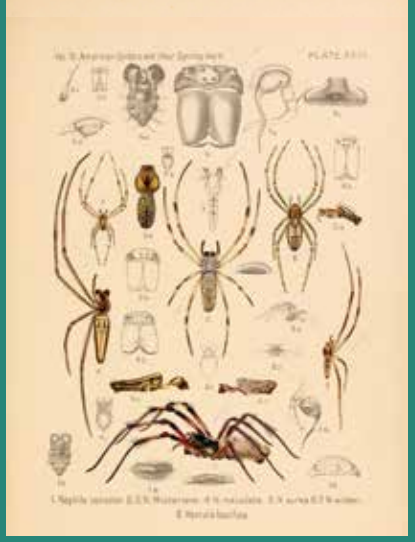
Brigadier General Isaac J. Wistar. Photo courtesy of United States Military History Institute.

Isaac Jones Wistar, great-nephew of physician and anatomy professor Dr. Wistar, was an American Renaissance man of his time: a frontiersman, trapper, gold rusher, rancher, lawyer, and a Union Army captain. His Civil War experience began in 1861, as a lieutenant-colonel in the 71st Regiment of Pennsylvania Volunteers in the Union Army. After two campaigns and multiple engagements on the battlefields of Virginia, he was wounded at Ball's Bluff and again at Antietam. Promoted to Brigadier General, Isaac occupied a chief military role at the Confederate stronghold of Yorktown, including establishing a haven for escaped slaves. Upon return to civil life in 1864, Isaac resumed his law practice. He later became vice president of the Pennsylvania Railroad Company and oversaw the Pennsylvania Canal System. He served as president of the American Philosophical Society (like his great uncle before him) and the Academy of Natural Sciences. Isaac became deeply involved in prison reform, writing articles on prison policy and inmate reform and authoring books on penology.

Despite his adventurous life, Isaac's most notable and long-lived contribution was to the biological sciences through the establishment of The Wistar Institute, the nation's first independent biomedical research institute. Originally determined to make a donation towards the restoration of the Wistar and Horner Museum collection at the University of Pennsylvania, Isaac later realized he had an opportunity to make a greater impact while honoring the great-uncle he never knew, through the construction of a building, independent from the University, to house the museum. The University of Pennsylvania provided "a lot of land lying on the West side of Thirty-sixth Street, extending from Woodland Avenue to Spruce Street" (from the original deed of trust).

The idea of The Wistar Institute of Anatomy and Biology, as it was originally named, hatched from Isaac's vision of honoring the past while also making a long-lasting contribution to the future of natural sciences: he declared that, in addition to housing the Wistar and Horner Museum, the new institute would be free to initiate "any other work for the increase of original scientific knowledge." The incorporation of the Institute took place on April 22, 1892 and its first building was dedicated on May 21, 1894. The University and Isaac agreed that the relations between the two institutions should be of close collaboration while maintaining strict independence.





Nephila Wistariana

The "Nephila Wistariana," now known as Nephila clavipes, is a sub-classification of the golden silk spider. Henry McCook, in naming the spider after Isaac, assured him that it was one of the largest and most beautiful in existence. Today, these spiders are studied for the extreme tensile strength of their anchor silk. Recent *in vitro* experiments have utilized the silk filaments to help mammalian neuronal regeneration.

Illustration from American Spiders and their Spinning Work, vol. III, by Henry McCook, 1893. Credit: Wikimedia Commons.

"What glory is that to have your name hitched on to a spider!"

—Isaac Wistar, 1894

The Beginning

The Original Victorian Building

Brothers G.W. and W. D. Hewitt were hired to design a new building to house The Wistar Institute of Anatomy and Biology. The Hewitt brothers were well acquainted with Philadelphia's wealthy financers as their firm specialized in churches, hotels, and palatial residences. They are best known for the Philadelphia Bourse Building, the Philadelphia Cricket Club, and the iconic Bellevue-Stratford on Broad Street.

The doors of The Wistar Institute of Anatomy and Biology opened on May 21, 1894, to great acclaim. The building was four stories high and considered very modern for its time with exposed beams and steel-vaulted ceilings. It contained three large museum halls, a library, workshops, and rooms for lectures and research. Internal changes to the building would be made through time to house an increasing number of laboratories. In 1923, new facilities were built to install printing presses in support of the Wistar Press.

"There is no other building that I know of in this country so well equipped for carrying on the work for which it is intended."

—William Pepper, M.D., Provost of the University of Pennsylvania (1894)

Illustration of the 1894 building.


1892

Moving Forward

The Cancer Research Building

The next big architectural change occurred in 1975 as the Institute shifted its focus to cancer research upon being named a National Cancer Institute (NCI)-designated Cancer Center in basic research (1972). A new research building and vivarium were erected, supported in part by a $5 million NCI construction grant. The Cancer Research Building was designed by Mansell, Lewis and Fugate Architects.

Top: the Cancer Research Building, view from Spruce Street. Bottom: architectural rendering.

The Robert & Penny Fox Research Tower

The year 2014 brought about the biggest architectural transformation since the original 1894 Victorian-era structure was built: the inauguration of the Robert and Penny Fox Research Tower. Named after former chair of Wistar's Board of Trustees Robert Fox, and two of the Institute's most loyal and generous donors, the Fox Tower has allowed The Wistar Institute to recruit outstanding new talent from around the world, who are working on innovative strategies in emerging areas of science.

Designed by Ballinger Architects of Philadelphia, this tower of innovation was outlined to create a state-of-the-art interdisciplinary research space and a stronger visual identity to unify the 120+ years of architectural styling. The new addition houses five laboratory floors, adding nearly 90,000 square feet to the preexisting facilities while allowing a more integrated style of research and a greater degree of collaboration, reflecting the contemporary "team science" discovery approach.

"...science today requires space and infrastructure to foster open communication..."

—Russel Kaufman, M.D., The Wistar Institute president emeritus

The Wistar Institute Then and Now

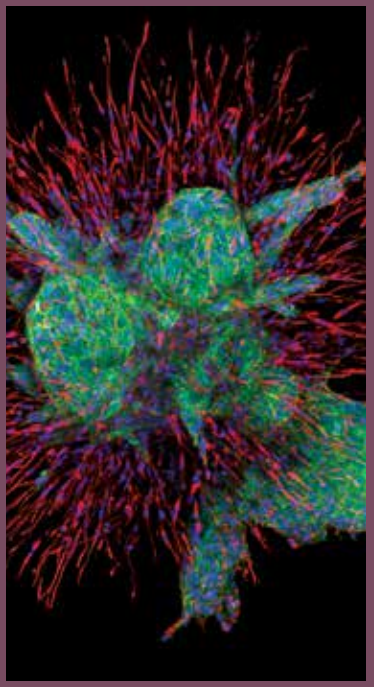
The Buildings

The Labs

People of Science

At Work

The Science



The Early Years of The Wistar Institute

The second and third directors of the Institute: Horace Jayne, M.D., (left) who served from 1894 to 1905, and Milton J. Greenman, M.D., Sc.D., (right) who served from 1905 to 1937. Photo taken in 1903.

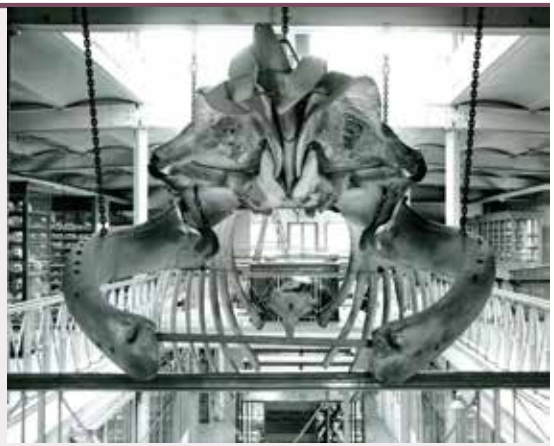
"...[the] museum of The Wistar Institute is a textbook illustrated by the specimens themselves."

—Horace Jayne, M.D.

When the new building opened its doors in 1894, under the direction of zoologist Horace Jayne, M.D., the primary mission of the Institute was museum work, responding to the widespread popularity of natural history museums among the public and scientific community in the late 19th century. The Wistar collection encompassed tens of thousands of anatomical teaching aids, skeletons and wax-injected organs. The museum's skulls and bones, well-known to Penn medical students and artists alike, provided dramatic examples of pathology and abnormality. The Wistar museum would be redesigned in 1957 to clear space for laboratories and ultimately downsized in 1987 when the majority of the collection was transferred to several museums throughout the country and a small exhibit area was built in the lobby to display representative specimens of the original Wistar and Horner collection.

A SIGN OF THE TIMES

The skeleton of a 60-foot finback whale—collected by paleontologist Edward Drinker Cope in 1897 and donated to The Wistar Institute by the University of Pennsylvania, could be seen suspended from the atrium ceiling for almost 60 years. In 1956, to make room for more laboratory space, the skeleton was transferred by freight train to the Field Museum of Natural History in Chicago.



About Brains and Their Size

Where else but Philadelphia would The Anthropometric Society be formed (circa 1890) to advance the study of brain science? Led by a group of distinguished scientists and medical doctors, the founders included familiar names such as the Leidy brothers, S. Weir Mitchell, M.D., Edward Drinker Cope, William Pepper, M.D., William Osler, M.D., and Isaac J. Wistar. Becoming a member of this society meant you promised to leave your brain to science. Specifically, your family agreed that within hours of your death, your brain would be removed and sent to The Wistar Institute, where it would be weighed, photographed, and analyzed.

The prevailing theory was that the physical size (and weight) of a brain directly correlated to the intelligence of its owner. Collecting the "smartest" brains would allow the group to test their theory. In 1907, the American Philosophical Society published "A study of the Brains of Six Eminent Scientists and Scholars Belonging to the American Anthropometric Society," written by Edward Anthony Spitzka, M.D. Dr. Spitzka—of the Daniel Baugh Institute of Anatomy, part of Jefferson Medical College—was a big advocate that brain-weight and mental superiority were significantly correlated.

In 1912, Wistar director Dr. Greenman received the brain of John H. Musser, M.D., a renowned medical expert known for his authority on heart diseases. He was found to have a brain only 1-ounce heavier than the prevailing understanding of "normal intelligence requiring a brain of at least 32-ounces." When compared to the 67-ounce brain that had belonged to an illiterate bricklayer, many believed the theory of weight to mental intelligence had been thoroughly disproved. Dr. Spitzka, however, would persist. In an article that appeared in the *New York Times* he claimed that the recorded weight of Dr. Musser's brain had been incorrectly transcribed, and was in fact 56-ounces, because a 33-ounce brain could have never belonged to such an intelligent man.

The brain of William Osler, M.D., a distinguished Canadian physician and one of the founding professors of Johns Hopkins Hospital, regarded as the "Father of Modern Medicine", was sent to Wistar at the time of his death, in 1919.

"Perhaps we shall have to conclude that the physiologists don't know much about it."

—Other View Points editorial from the Philadelphia Inquirer April 13, 1912

The Conference of Anatomists

"We are not constructing a mere plaything for our own times, but an enduring monument for a far-stretching future."

—Isaac Jones Wistar

The Institute's third director, physician Milton J. Greenman, M.D., Sc.D., who held the position for 32 years beginning in 1905, led Wistar in the direction first envisioned by founder Isaac as "seekers after new and original knowledge." Dr. Greenman wanted the Institute to be a center of scientific investigation and not merely a museum. With Isaac's permission, he convened an advisory board of the country's most celebrated and influential anatomists who gathered at the Institute for what is known as "the conference of anatomists" to debate the future of biological research and medical training. What passed for state-of-the-art in the Institute's earliest days—studying human anatomy and the causes of health and disease by examining physical specimens—was insufficient for these progressive thinkers. More than simply describing their observations, they yearned to go deeper by testing hypotheses and proving results. This conference helped clarify three distinct areas of focus—neurology, comparative anatomy and embryology. Further, it was established that "the principal object of the Institute should be research."

1905 photo of the conference of anatomists held at The Wistar Institute.

The Center of American Biology

The importance of research continued to grow in turn-of-the-century America as Dr. Greenman built his vision of "a central station for anatomical research in the country." His idea of research shifted away from comparison and classification toward a modern investigation of biological processes. In 1906, Dr. Greenman—along with his director of the neurophysiology program, Henry H. Donaldson, M.D.—prioritized the Institute's research into three areas: experimental, creative, and investigative biology. Major steps were taken to train students in Wistar labs and to publish and circulate scientific papers. International scientists were invited to take part in yearly sabbaticals to learn from Institute faculty. The Institute's personnel increased from 11 to 45. Dr. Greenman worked to increase the Institute's scientific prestige through two main endeavors: developing a standardized laboratory animal model and producing scientific publications in house. Between 1905 and 1925, Wistar scientists published 227 original scientific papers.

The Wistar Rat

The Wistar rat is the prototype of the standardized laboratory animal. It was developed by Drs. Greenman and Donaldson, along with Helen Dean King, Ph.D., a zoologist with a research focus on genetics and embryology. Dr. Donaldson considered the albino rat an ideal laboratory animal model because its nervous system develops in the same manner as the human one, but much faster. In 1915, he published a report of laboratory standards for the Wistar rat. Dr. King was instrumental in the development of the Wistar rat colony—which she used for her studies on the effects of inbreeding and mammalian genetics—at a time when geneticists were beginning to shift their interest from invertebrates as model organisms for the study of embryology.

Starting in 1912, the Institute sold stock from its colony. By the late Thirties, over 400 articles on the Wistar rat had been published by Dr. Donaldson and his colleagues as the albino rat was the world's most widely used laboratory animal. In 1942, Wistar started to protect its commercial rights and the name WISTARAT was trademarked. Wistar sold its breeding stocks and the rights to the name in the 1960s, but more than half of the current strains of rats used in laboratories today derive from Wistar rat ancestors.

A Shift in Focus

For about 30 years, Drs. Greenman and Donaldson worked together to concentrate the efforts of the Institute on focused research programs. However, a significant institutional shift was in store when Dr. Greenman died in 1937 and Dr. Donaldson followed in 1938. The man chosen to fill the leadership void was Edmond J. Farris, Ph.D., who was appointed the new director in 1937. Dr. Farris would become internationally known for his work on human reproduction and fertility during his two-decade tenure running the Institute. Dr. Farris' vision shifted the emphasis from biomedical research, which consequently saw a decline in the Institute's laboratory facilities and related scientific contributions. What came to be known as the "modern era" of the Institute was led by the new director, Hilary Koprowski, M.D., appointed in 1957. Under his hard-nosed efficiency, any traces of the museum era were forever excised to make way for a cadre of trailblazing scientists to run his newly renovated laboratories.

The Wistar Institute library, circa 1920.

More Firsts at The Wistar Institute

Shinkishi Hatai, Ph.D., arrived at the Institute in 1906, and was the first international scientist to take a year-long sabbatical at Wistar. Born in Japan and trained as a zoologist in America, Hatai worked with Dr. Donaldson on the Wistar rat population. He would later become known as the father of Japanese biology through the establishment of a biological institute at Tohoku Imperial University.

Helen Dean King, Ph.D., was The Wistar Institute's first female scientist. From 1909 until her retirement in 1950, she bred the Wistar rat and conducted research focused on inbreeding, using the rats as an experimental model to elucidate the implications of genetics in human heredity. Dr. King was one of a small handful of women scientists working in the largely male-dominated field of science at the turn of the 20th century. She published more than 80 research papers and belonged to many scientific societies. At first, Dr. King was accepted into the male world of genetics because of her expertise in breeding the Wistar rat, which became a desirable tool for the scientific community, and then because they recognized her scientific value. In 1932, Dr. King was awarded the Ellen Richards Research Prize, once known as the "Women's Nobel."

Warren Lewis, M.D., and **Margaret Reed Lewis, Ph.D.**, joined the Institute in 1940 and specialized in tissue culture and cancer studies. They are the earliest example of married scientists who both worked and lived at the Institute.

Left, Shinkishi Hatai, Ph.D., and family. Right, Helen Dean King, Ph.D.

THE WISTAR PRESS

Starting in 1908, the Institute played a key role in the international dissemination of biological research results with the publication of five major scientific journals. Between 1908 and 1924, an estimated 81,000 pages worth of scientific materials were published by the Wistar Press. In 1923, new facilities were built to install printing presses. Dr. Greenman also realized the importance of providing abstracts of articles in native languages, such as Japanese, Chinese, and Spanish, to help professors in teaching to undergraduate students.

In 1979, times had changed and publication printing was not central to the Institute's mission anymore. To make space for new research laboratories, the Wistar Press was sold. The new owners went on publishing some of the journals and the Institute still has a free subscription to its original Wistar Press titles in memory of the press era.

Today's Discoveries—Tomorrow's Cures

HILARY KOPROWSKI, M.D., APPOINTED FIFTH DIRECTOR OF THE WISTAR INSTITUTE

Hilary Koprowski, M.D., was appointed director of The Wistar Institute in **1957** and was at the helm until 1991, a period during which the Institute achieved international prominence for its vaccine and monoclonal antibodies research and first earned designation as a National Cancer Institute Cancer Center. Dr. Koprowski greatly increased Wistar's scientific budget through federal grants and private foundations, modernized the Institute and built a prestigious research faculty by recruiting top biologists from around the world. He also shifted the research emphasis from anatomy to basic biomedical research in virology, immunology, degenerative diseases and cancer. A distinguished virologist, Dr. Koprowski developed the first polio vaccine, which proved successful in clinical trials in Eastern Europe and the Belgian Congo. During his tenure as director, Wistar scientists developed vaccines against rubella and rabies, both of which are in universal use today. His impact on science was demonstrated by his election to the National Academy of Sciences and the American Academy of Arts and Sciences.

MR. CHOLESTEROL

While working at the Institute in **1959**, the biochemist and expert in human nutrition David Kritchevsky, Ph.D., published the influential textbook *Cholesterol*, which explored his studies on the mechanisms of atherosclerosis, or fat deposits in blood vessels, and the role of cholesterol deposits in cardiovascular disease. Known as a resident wit, Dr. Kritchevsky's "Ode to the Dietician" was published in the *New England Journal of Medicine* in 1960.

DISCOVERY OF THE HAYFLICK LIMIT

Refuting the prevailing belief that normal cells are immortal, in **1961** Leonard Hayflick, Ph.D., demonstrated that a population of normal human fetal cells in culture will divide a definite number of times and then enter a senescence phase, in which they are metabolically active but unable to divide. This notion is universally known as the "Hayflick Limit." Dr. Hayflick's study was first rejected by a prominent journal—*The Journal of Experimental Medicine*, and the rejection letter, written by Nobel Prize recipient Peyton Rous, reflected how sometimes scientific assumptions become dogmas. The letter stated "Anyone who has worked with tissue culture knows that if the cells are provided with the proper milieu in vitro they will replicate indefinitely."

CREATION OF THE WI-38 CELL LINE

Leonard Hayflick, Ph.D., and Paul S. Moorhead, Ph.D, established the WI-38 cell line of human diploid fibroblasts in **1962**. While many experimental cell lines available at that time derived from cancers or were genetically abnormal, WI-38 cells were the first and most extensively studied "normal" cell line to be grown in virtually unlimited quantities. WI-38 cells have been used to develop lifesaving vaccines, as normal control cells for comparison with diseased ones, and remain a leading tool for studying cellular aging and cancer. The above image is an electron micrograph of a WI-38 cell.

As an invaluable tool in the manufacture of vaccines such as rubella, rabies, measles, and more, the WI-38 cells have helped saved hundreds of millions of lives.

HUMAN RABIES VACCINE DEVELOPED

In **1968**, the rabies vaccine of human diploid cell origin was developed by Tadeusz Wiktor, V.M.D., Hilary Koprowski, M.D., and Mario V. Fernandes, D.V.M. In contrast to earlier rabies vaccines, deriving from the work of Louis Pasteur, the Wistar vaccine prompts a stronger immune response, making it almost 100% effective while causing fewer side effects and being considerably less painful to administer. The vaccine is widely used in the U.S., western Europe and other countries.

In the above photo from 1971, Stanley Plotkin, M.D., injects the rabies vaccine into the arm of Dr. Koprowski, as Dr. Wiktor smiles for the camera.

Wistar's rabies vaccine has helped to make rabies-related human death a rarity in the U.S. and most other countries.

Today's Discoveries—Tomorrow's Cures

WISTAR SCIENTISTS DEVELOPED A VACCINE AGAINST RUBELLA (GERMAN MEASLES)

In **1969**, Stanley Plotkin, M.D., developed the attenuated RA27/3 strain rubella virus vaccine through low-temperature passaging in the human diploid fibroblast cell line WI-38. This attenuated strain vaccine has been successfully used worldwide since the 1970s for the prevention of rubella infection and can be administered as a standalone product or as part of a combination vaccine, e.g. measles, mumps, rubella vaccine (MMR). The live attenuated virus vaccine is safe, efficacious (more than 95% of vaccinated individuals become immune against the disease) and produces long-lived immunity.

During pregnancy, rubella infection (German measles) was once greatly feared as a cause of devastating birth defects. Wistar's vaccine has led the charge in the eradication of rubella in the United States, and in 2005 the World Health Organization launched a global campaign to promote the vaccine, saving an estimated 7.5 million lives.

WISTAR INSTITUTE BECAME A NCI-DESIGNATED CANCER CENTER

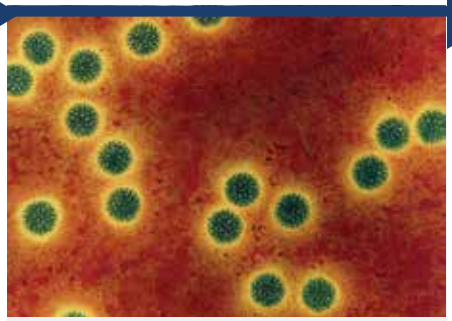
In **1972**, The Wistar Institute became the first National Cancer Institute (NCI)-designated Cancer Center in the nation solely devoted to fundamental research in the biology of cancer. NCI Cancer Centers are recognized by the National Institutes of Health for their scientific leadership, resources, and the depth and breadth of their research on cancer.

This designation has been held at the Institute ever since. Most recently, the Institute was granted Renewed Status in 2013. After an extensive review, the NCI rated The Wistar Institute Cancer Center—and its director—as "exceptional" and recommended renewal for Wistar's Support Grant with an award of $14.9 million over five years. Wistar's commitment to collaboration across disciplines and in partnership with other institutions played a significant role in securing renewed status as an NCI Cancer Center, as evidence that the Institute is truly a collaborative hub of excellence and innovation.

FIRST PATENT FOR MONOCLONAL ANTIBODIES GRANTED TO THE WISTAR INSTITUTE

Monoclonal antibodies bind to specific proteins on the surface of cells. They are produced using a technology developed by Georges Köhler, Ph.D., and Cesar Milstein, Ph.D., who were awarded the Nobel Prize in 1984 for their work. Hilary Koprowski, M.D., Carlo Croce, M.D., and Walter Gerhard, M.D., were among the first to take advantage of this technology to develop antiviral and anti-tumor cell monoclonal antibodies. In **1979**, Wistar was granted the first ever patent for the making of monoclonal antibodies and the Institute rapidly moved to the forefront of monoclonal antibody research. 17-1A was the first monoclonal antibody tested in clinical trials for gastrointestinal cancer and opened the door to the era of cancer immunotherapy. Monoclonal antibodies against IL-12, a molecule discovered at Wistar, have led to Stelara, a medication to treat the skin disease psoriasis.

Because of their ability to bind to their target with high specificity, monoclonal antibodies were hailed as the "magic bullets" of anti-cancer drugs. They have been versatile tools for basic research, diagnostics and therapy for cancer, infectious and inflammatory diseases since the early 1980s.



SCIENTISTS AT WISTAR AND THE CHILDREN'S HOSPITAL OF PHILADELPHIA STARTED DEVELOPING A VACCINE AGAINST ROTAVIRUS, RESPONSIBLE FOR GASTROENTERITIS IN CHILDREN

In **1980**, H. Fred Clark, D.V.M., Paul A. Offit, M.D., and Stanley A. Plotkin, M.D., of The Wistar Institute and the Children's Hospital of Philadelphia began their effort to create a vaccine against a virus that causes severe diarrhea and vomiting among infants and young children and is responsible for tens of thousands of hospitalizations in the United States and hundreds of thousands of deaths around the world each year.

DISCOVERY OF THE BCL-2 GENE

Cancer researcher Carlo Croce, M.D., who worked at Wistar from 1970 to 1988 and held the position of associate director from 1980 to 1988, cloned and characterized the B-Cell lymphoma (BCL2) gene in **1985**, defining its role in various lymphomas such as follicular lymphoma. While at Wistar, Dr. Croce also discovered the deregulation of the MYC oncogene in Burkitt lymphoma.

BCL2 was one of the first oncogenes mapped to the site of a chromosomal translocations and proved that chromosomal abnormalities can cause cancer. Therefore, the BCL2 discovery represented a milestone in cancer research as it provided critical insights into the underlying genetic basis of cancer. BCL2 was also an ancestor to the family of anti-apoptosis genes that protect the cells from programmed death.

Today's Discoveries—Tomorrow's Cures

DISCOVERY OF INTERLEUKIN-12 (IL-12)

In **1989**, Giorgio Trinchieri, M.D., renowned immunologist and first chair of Wistar's immunology research program, discovered interleukin-12 (IL-12), a molecule that stimulates the formation of a special type of lymphocytes called natural killer cells. These cells are critical components of the innate immune system that comes into action immediately after the attack of a pathogen, to protect us against infection. Dr. Trinchieri and his group at Wistar spent several years characterizing the mechanisms of IL-12 production and the role of this molecule in tumor immunity, infections, and autoimmunity.

Several clinical trials are ongoing to test the use of IL-12 as adjuvant in cancer immune therapy and biologic therapies with monoclonal antibodies against IL-12 are used to treat the skin disease psoriasis.

DISCOVERY OF THE RNA EDITING PROCESS

Wistar scientist Kazuko Nishikura, Ph.D., discovered a mechanism of RNA regulation through which cells can make discrete changes in the sequence of nucleotides — the "letters" in the RNA code, ultimately affecting the protein product. The study, published in **1989**, also characterized a family of enzymes called ADAR (adenosine deaminase acting on RNA) that are responsible for RNA editing.

GIOVANNI ROVERA, M.D., APPOINTED THE SIXTH DIRECTOR OF THE WISTAR INSTITUTE AND DIRECTOR OF THE WISTAR INSTITUTE CANCER CENTER

In **1991**, Giovanni Rovera, M.D., succeeded Dr. Koprowski and took on the challenge of balancing Wistar's budget deficit while maintaining its status as a world class research institution. He recruited a talented group of young cancer investigators with expertise in genetics, structural biology, biology, and immunology. The Institute's basic science programs were restructured and the leadership was decentralized, spreading it among the heads of four scientific programs: molecular genetics, tumor biology, tumor immunology, and structural biology. Dr. Rovera's research focused on the molecular basis of leukemia and childhood malignancies.

THE WISTAR INSTITUTE CENTENNIAL

In **1994**, the Institute celebrated the centennial of the original Victorian research building opening. A dinner was held to honor Isaac's request that one of the unique bequests he made to the Institute– a bottle of rum, be drunk "on the completion of the first century of its corporate existence." On this occasion, the Wistar Award was established to honor individuals who have been instrumental in ensuring the continuing vitality of the Institute, and it was presented to Robert A. Fox.

FIRST WILDLIFE RABIES VACCINE LICENSED IN THE U.S.

In **1995**, William H. Wunner, Ph.D., Peter J. Curtis, Ph.D., and Charles E. Rupprecht, D.V.M., Ph.D., helped develop an oral rabies vaccine to be administered prophylactically through bait to particular wildlife populations.

Developed in response to an emerging rabies crisis among raccoons along the East Coast of the U.S., this vaccine is now used worldwide to protect wild animals and, indirectly, neighboring human populations.

LAUNCH OF WISTAR'S BIOMEDICAL TECHNICIAN TRAINING PROGRAM (BTTP)

In **2000**, in collaboration with the Community College of Philadelphia, Wistar launched a two-year training program, the first of its kind, to prepare college students for careers as research technicians and reinforce the region's workforce with experienced lab technicians. The program was started by William H. Wunner, Ph.D., Wistar's director of Academic Affairs and director of Outreach Education and Technology Training Programs, and continues to present day. Another goal of the program is to bring more diversity to science: more than half of the graduates are minorities and seven out of 10 are women.

Today's Discoveries—Tomorrow's Cures

SEMINAL DISCOVERIES IN THE FIELDS OF EPIGENETICS AND GENE EXPRESSION

Throughout the years **2000s**, Wistar scientists made seminal contributions to the field of epigenetics and transcription, which studies how the genome is packaged and regulated within the cell nucleus. DNA is wrapped around structural proteins called histones to form DNA/protein elements called nucleosomes that resemble microscopic thread spools. Histones are decorated by chemical modifications that determine how DNA is transcribed into RNA, to make a unique pattern of gene expression for every cell type in the body.

Shelley Berger, Ph.D., and Thanos Halazonetis, Ph.D., identified the role of histone modifications in gene regulation and DNA repair. The Berger lab also revealed how epigenetic enzymes regulate non-histone proteins, such as the tumor suppressor p53.

Ramin Shiekhattar, Ph.D., described how different RNA species function to regulate transcription. His lab discovered the microprocessor, a protein complex that mediates the genesis of regulatory microRNAs, a class of small RNA molecules that do not encode proteins but regulate silencing of gene expression. He also discovered that long noncoding RNAs (lncRNAs) work as enhancers of gene expression in specific cell types.

The discovery of epigenetic regulatory pathways paved the way for a new therapeutic direction that counteracts cancer progression and metastasis by developing drugs that interfere with the aberrant gene regulation of neoplastic cells.

DISCOVERY OF T LYMPHOCYTE POPULATIONS THAT PREVENT IMMUNE RESPONSES AGAINST SELF

Wistar scientist Andrew Caton, Ph.D., described in **2001** the mechanism of generation of regulatory T cells, which modulate the immune system, maintain tolerance to self-antigens, and prevent autoimmune disease.

Modulation of regulatory T cells can treat autoimmune disease and facilitate organ transplantation. Since these cells are thought to suppress anti-tumor immunity, their modulation is being explored for cancer immunotherapy.

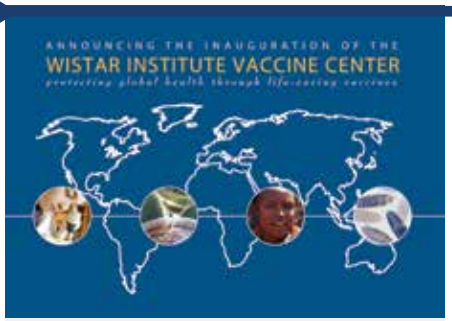
RUSSEL E. KAUFMAN, M.D., APPOINTED PRESIDENT AND CEO OF THE INSTITUTE AND DIRECTOR OF THE CANCER CENTER.

During his tenure, which began in **2002**, Russel Kaufman, M.D., embarked on strategic planning and faculty recruitment, and fostered collaborations with regional academic and life sciences industry partners. Dr. Kaufman guided the Institute through its $35 million capital campaign, "Building Wistar, Changing the World," which began in 2010 and supported the building of the Fox Tower and has substantially raised Wistar's endowments. Dr. Kaufman stepped down as president and CEO in 2015.

ROTATEQ VACCINE APPROVED FOR PREVENTING CHILDHOOD ILLNESS

The FDA announced in **2006** the licensing of the rotavirus vaccine developed collarboratively by Wistar, Children's Hospital of Philadelphia (CHOP), and Merck & Co., Inc. in the 1980s. The vaccine is sold as ROTATEQ® and is part of the recommended immunization schedule for infants 6 weeks to 32 weeks of age.

It is estimated that Wistar's rotavirus vaccine saves American children 250,000 emergency room visits and 70,000 hospitalizations annually.

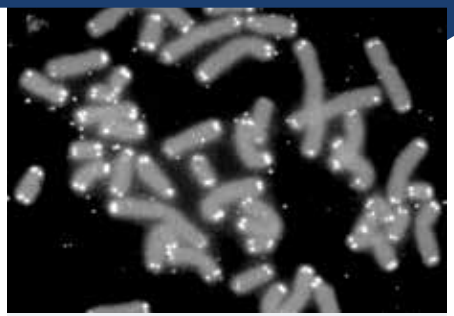


LAUNCH OF THE WISTAR VACCINE CENTER

Wistar celebrated the launch of the Vaccine Center in **2007** with Hildegund C.J. Ertl, M.D., as its first director. The new Vaccine Center was designed to draw upon the Institute's strengths in immunology, virology, and other research disciplines to develop new vaccines for HIV, rabies, influenza, Hepatitis C, malaria and other infectious diseases, and cancer.

In **2016**, vaccine expert David B. Weiner, Ph.D., was appointed director of what has been renamed the Vaccine & Immunotherapy Center, which now emphasizes research on next generation vaccines and cancer immunotherapy.

Today's Discoveries—Tomorrow's Cures



STRUCTURE OF TELOMERASE DECODED

In **2008**, Wistar scientist Emmanuel Skordalakes, Ph.D., became the first to decode the structure of the catalytic portion of telomerase, the enzyme responsible for replicating DNA at the ends of chromosomes (telomeres).

Telomerase is aberrantly expressed in roughly 85% of cancers, with higher levels of activity in advanced and metastatic tumors, making it a cancer biomarker and an important therapeutic target. Deciphering a key part of the telomerase was a breakthrough that scientists had sought for more than a decade.

LAUNCH OF THE WISTAR MELANOMA RESEARCH CENTER

The Wistar Institute is home to one of the most prestigious and long-standing melanoma research programs in the country, which has contributed key discoveries on basic genetics, signaling pathways, targeted therapies, and the stem cell-like abilities of melanoma cells to evade treatment. Wistar scientists also developed new tools for melanoma research, including a three-dimensional "artificial skin" model for studying how living tumors behave.

The Melanoma Research Center was launched in **2010** under the direction of melanoma research pioneer Meenhard Herlyn, D.V.M., D.Sc., to fast track basic research that could lead to defining new therapies. The center serves as a hub to bring scientists, physicians, the life sciences industry, and melanoma advocates together.

DARIO C. ALTIERI, M.D., APPOINTED PRESIDENT AND CEO OF THE WISTAR INSTITUTE

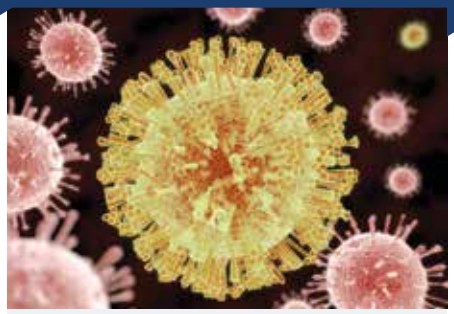
Cancer biologist Dario C. Altieri, M.D., was appointed director of the Wistar Cancer Center and became the Institute's first chief scientific officer in **2010**. He expanded the Cancer Center, recruiting a "critical mass" of multidisciplinary researchers to further both the Institute's excellence in basic scientific research and its ongoing efforts in translating discoveries into therapies.

In **2015**, Dr. Altieri succeeded Dr. Kaufman as president and CEO of the Institute while retaining his role as director of the Cancer Center. Dr. Altieri also leads a research program that studies how tumor cells evade programmed cell death and the role of mitochondria, power plant of the cells, in tumor metabolism.

IDENTIFICATION OF BIOMARKERS FOR BLOOD-BASED LUNG CANCER DIAGNOSTIC TEST

Research led by Wistar scientist Louise Showe, Ph.D., identified a characteristic gene expression signature that can be detected in the blood of lung cancer patients and used as a marker for early diagnosis. In **2016**, based on this discovery, a blood-based biomarker panel was licensed to a commercialization partner for the development of a commercial lung cancer diagnostic test.

Lung cancer is often found at late stages, when it's very difficult to treat. Effective early diagnostic tools would have a great impact on therapeutic options and survival rates.



A VACCINE AGAINST THE ZIKA VIRUS

In **2016**, a new generation DNA-based vaccine against the Zika virus showed protection from infection, brain damage and death in a preclinical model. The vaccine was developed by David B. Weiner, Ph.D., his colleagues and partner institutions. The same year, the FDA approved the start of the first human clinical trial of this vaccine that is currently underway.

The Zika virus causes a mosquito-borne disease associated with microcephaly in unborn babies, and serious neurological problems in adults. No treatment or vaccine is currently available and during the global Zika outbreaks in 2015 hundreds of thousands of cases have been reported.

IDENTIFICATION OF A NOVEL MARKER TO CHARACTERIZE CELL POPULATION THAT SUPPRESSES IMMUNITY IN CANCER PATIENTS

In **2016**, Dmitry I. Gabrilovich, M.D., Ph.D., program leader of Wistar's Translational Tumor Immunology program, and his research team identified a marker for myeloid-derived suppressor cells (MDSCs), a population of immune cells implicated in tumor resistance to various types of cancer treatment, including targeted therapies, chemotherapy and immunotherapy. The new marker has a potential clinical impact as it could be used to help direct treatment decisions and to target MDSCs for therapeutic benefit.

The Wistar Institute Today

Today, The Wistar Institute is home to more than 275 scientists from more than 30 countries, working in 34 laboratories that conduct cutting-edge research on tumor biology, immunology and microenvironment; mechanisms of gene expression and regulation; and infectious diseases and vaccine development. Wistar's scientists are exposed to a multidisciplinary and highly collaborative environment that emphasizes "team science," bringing together expertise across scientific disciplines to explore new possibilities and new ideas.

The Institute is committed to remaining an engine of transformative biomedical discovery and carrying forward its pioneering scientific legacy in the life sciences. Our scientists pursue novel and courageous research paths and train new generations of scientists with the ultimate goal of translating basic discoveries into new therapies and producing groundbreaking advances in world health.

The Wistar Institute's 125th anniversary is a unique opportunity to celebrate our accomplishments and gain inspiration from our rich past and unique history of scientific breakthroughs. We look forward to the next 125 years and beyond with the same visionary attitude of our founders, past leaders and innovative scientists.

The "Caspar" kinetic sculpture created by artists Joel Erland and Kate Kaman in 2014 and suspended over the main entrance of the Fox Tower takes inspiration from Wistar's cultural history and the research taking place today, symbolizing a DNA helix, protein ribbons and Wisteria petals.

This commemorative edition of Wistarabilia was created to celebrate the 125th anniversary of the first independent biomedical research institute in the United States, and the Wistar family's 300th anniversary since arriving to the United States on September 16, 1717. Within the confines of the space for this book, it is not possible to acknowledge and highlight all of the people who have made significant contributions to Wistar's rich history and scientific discoveries. We welcome any additional information and/or materials to add to our archives, please email communications@wistar.org.

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