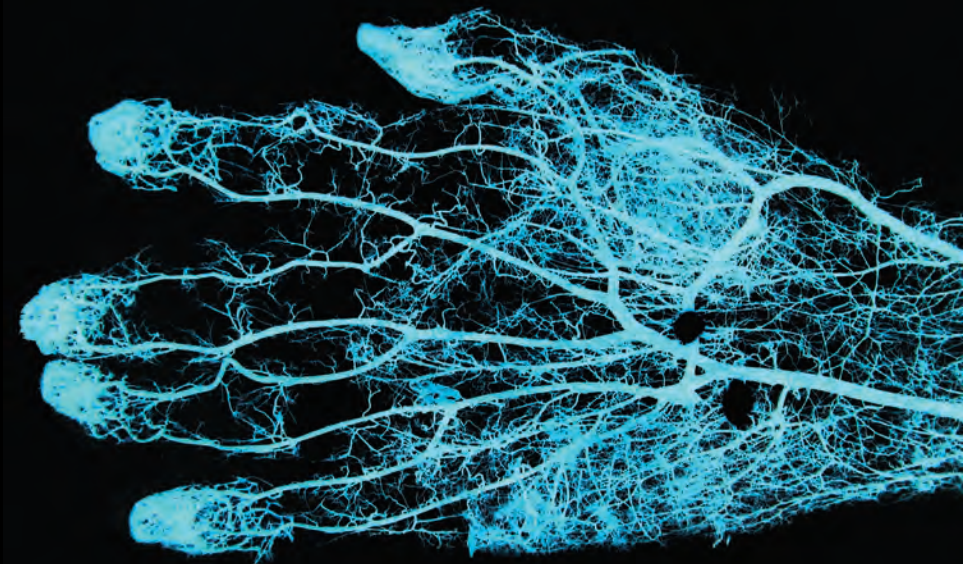


NATIONAL MUSEUM OF HEALTH + MEDICINE CHICAGO

a new kind of museum experience ...



## PARTNERS

### THE NATIONAL MUSEUM OF HEALTH AND MEDICINE

The National Museum of Health and Medicine, a Department of Defense museum, was established in 1862 and inspires interest in and promotes the understanding of medicine—past, present, and future—with a special emphasis on tri-service American military medicine. As a National Historic Landmark recognized for its ongoing value to the health of the military and to the nation, the Museum identifies, collects, and preserves important and unique resources to support a broad agenda of innovative exhibits, educational programs, and scientific, historical, and medical research. In its current configuration and planned relocation, the NMHM is poised for broadened attention and use by scholars, scientists, and the public at large.

### ADRIAN SMITH + GORDON GILL ARCHITECTURE

Adrian Smith + Gordon Gill Architecture is dedicated to the design of high-performance architecture and the creation of new paradigms for sustainable development. The office uses a holistic, integrated approach that emphasizes a symbiotic relationship with the natural environment and the creation of innovative new design solutions with every project. The firm is dedicated to the exploration and new technologies and the application of those technologies within buildings, pushing the boundaries between art and science. The firm currently has work in countries across the globe, and is responsible for the design of some of the world's most sustainable buildings. For more information, please visit [www.smithgill.com](http://www.smithgill.com).

Images courtesy of National Museum of Health and Medicine & Adrian Smith + Gordon Gill Architecture

## A BRIDGE BETWEEN THE PHYSICAL AND VIRTUAL

The [National Museum of Health and Medicine](#) in Washington, D.C. is one of America's oldest and most respected institutions—and also one of its most forward-looking.

With roots in the 19th century—collections include remnants of the remains of Abraham Lincoln, John Wilkes Booth, and other key figures from the Civil War—NMHM is at the forefront of a 21st Century exploration of the cutting edge of museum science. The museum's extensive historical, anatomical, and embryology collections are now in the process of being digitized and made available online, which will be of incalculable value to medical researchers, pathologists, clinicians, forensic scientists, and scholars in various other fields throughout the world.

An effort is underway to create a central repository for the museum's digital collections, data archives and related computational resources at a new satellite location in Chicago. The National Museum of Health + Medicine Chicago (NMH+MC) will function as a bridge between the physical and virtual realms. NMH+MC will feature interactive exhibits where visitors can explore biomedical information in new ways and will act as a home for a team of information scientists who will advance the museum's research initiatives.

## INFORMATION TO TRANSFORMATION

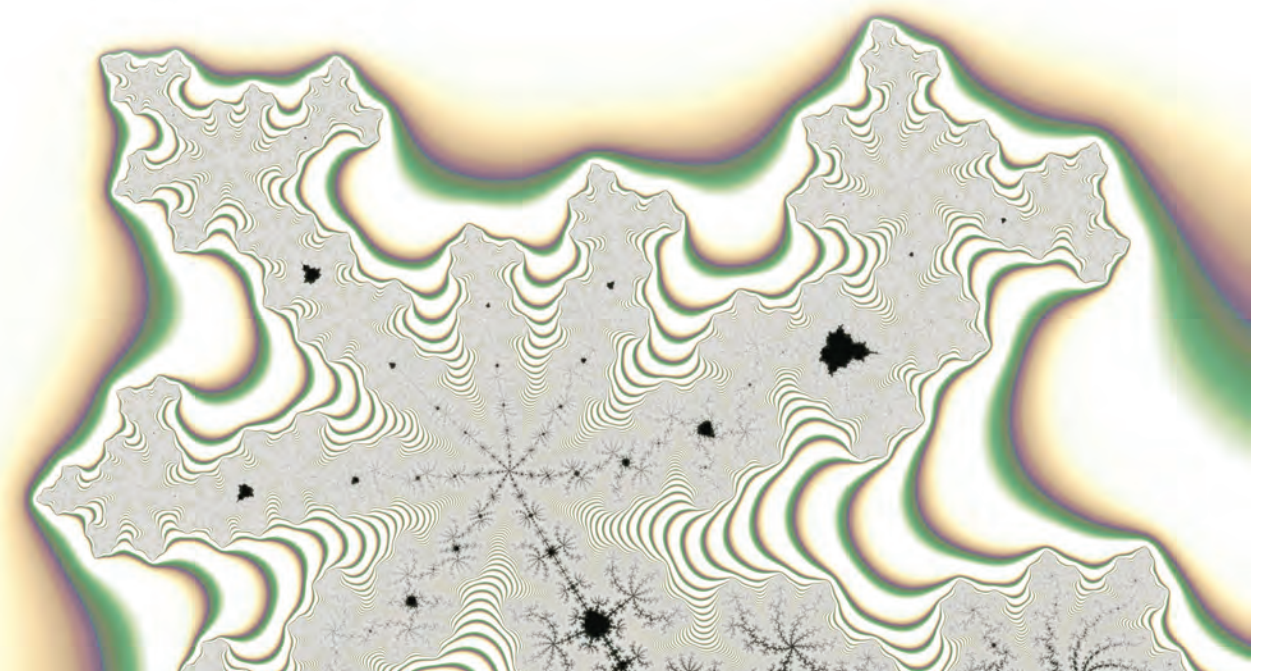
The virtual character of the museum's facilities and programming will allow NMH+MC to respond in a timely manner to contemporary biomedical issues as they develop. Exhibits drawn from the digital collections could be quickly organized to contextualize outbreaks such as the H1N1 virus, also known as swine flu, or shed light on a host of medical and social problems emerging in various parts of the world.

NMH+MC will also be the home for a team of information scientists who choreograph access to the digital collections and advance the museum's research initiatives. In the past, these initiatives—such as the Visible Embryo Project, which featured three-dimensional reconstructions of human embryos that could be accessed online by researchers in human development—have had **far-reaching impacts on medicine, information science, and ultimately society as a whole**. Technologies that were created in the early 1990's by Visible Embryo Project researchers led directly to the transformation of the World Wide Web from a collection of static documents into the rich interactive online environment of today, impacting the daily lives of billions of individuals worldwide, and spawning new industries that have dramatically invigorated the global economy. If past success is even only in a small part predictive of future achievements, the museum's potential to help shape the future of online knowledge discovery, exploration, and dissemination is certain to be of international significance.

NMH+MC will create an online community for students, parents, educators, and others to explore health science information while interacting with each other in social networks formed around topics in the health and medical sciences. It will integrate the concepts of cloud computing, social networking, and science fairs to provide an environment in which students can create and present independent research projects in the health and life sciences, and compete with each other for prizes and scholarships.

For clinicians, NMH+MC will provide an environment for social networking within knowledge-based affinity groups among health care workers globally. It will also give health care workers a richly interactive online interface to the museum's vast historical repositories and collections.

NMH+MC will also provide a supportive environment for groups who seek to improve public policy: hosting workshops and colloquia to facilitate the development and promulgation of policy positions on socially relevant issues in health and medical science; the provision of an online collaboration space to support policy workgroups for developing position papers; and the use of current online social networking and collaboration technologies to provide an on-demand health and medical science policy advisory resource for decision-makers in local, state, and federal governments.







Scoliosis © NMH&M



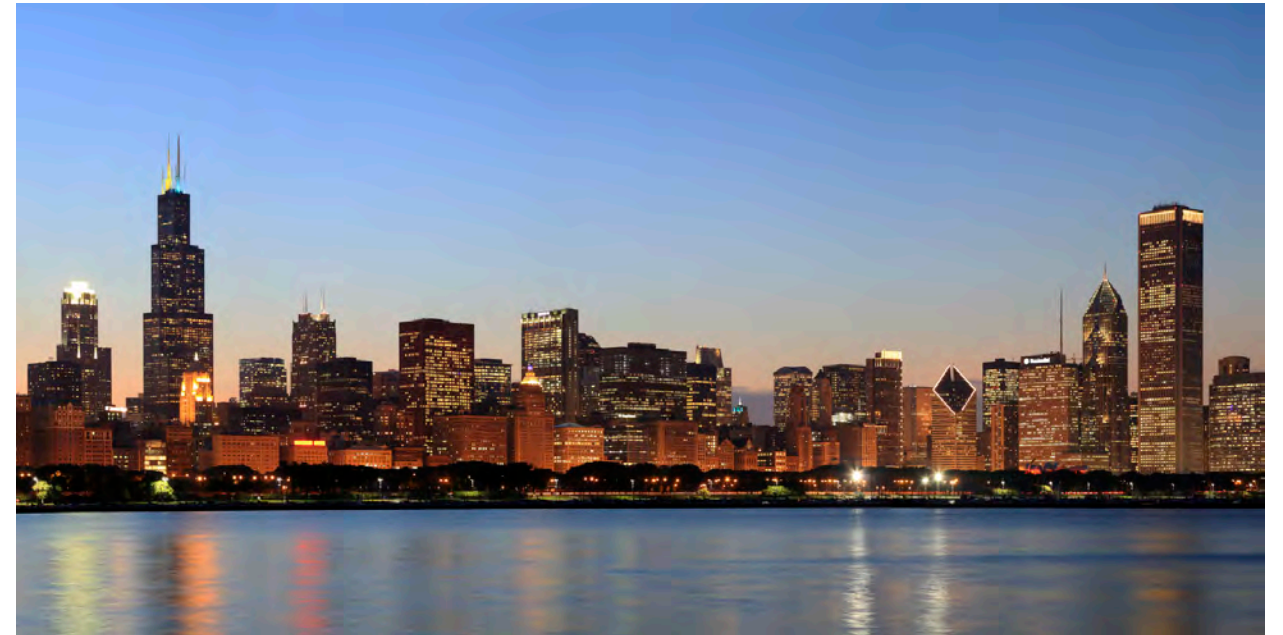
Lincoln Bullet © NMH&M



Battlefield Surgery © NMH&M



Hooke Microscope © NMH&M



## WHY EXPAND? WHY NOW?

The timing for the project is right. The NMHM headquarters in the nation's capital is in the process of moving--and as a result many of the museum's collections and archives will be separated from the physical exhibit space. This creates the perfect opportunity to establish a separate repository for the digitized versions of the collections, which will stand as a **visible link** between the museum's analog past and its digital future.

## WHY CHICAGO?

Chicago is an ideal city for a satellite museum. In addition to its central location, the Windy City is home to several institutions that regularly collaborate with NMHM including The University of Chicago, Argonne National Laboratory, and The Field Museum. Historically, Chicago has also played a role as a center for the teaching of medical illustration.

## THE MUSEUM AS A LIVING ORGANISM

With an eye toward a sustainable renovation, NMH+MC has purchased an existing building in downtown Chicago to house the new museum. Built in 1933, the three-story, 25,000 square foot masonry structure will undergo a dramatic, cutting-edge transformation led by Chicago-based design firm Adrian Smith + Gordon Gill Architecture (AS+GG).

AS+GG envisions a new kind of museum that is itself [a living organism](#): both metaphorically, in keeping with the museum's theme and content, and literally, as the high performance building will actually generate its own sustainable energy. As visitors engage with interactive exhibits throughout the museum, they will be able to individually generate energy that will power the building—mirroring the activities of nutrients within the human body.

These developing energy technologies—such as a heel-strike system which harvests force produced by foot traffic—will be visually represented on both interior surfaces and the building envelope, showing visitors the “real-time” display of their energy generation. When the museum is lightly populated it will exude a quiet energy; at peak times it will visibly flicker and pulse from the physical presence of its occupants.

The building's facade will also incorporate a new high-tech “wrapper” that projects imagery relating to the museum and its programming. This dynamic exterior will intrigue visitors and engage in an architectural dialogue with the Pritzker Pavilion bandshell to the east on Washington Street.





## FLUID, SCULPTURAL, DYNAMIC SPACES

NMH+MC will take advantage of 21st century technology to create a museum experience that is completely flexible. Virtually every interior surface of the building will be able to display visual and audio data, allowing visitors to view individually customized exhibit content as they move throughout the building. This **dynamic configurability** will result in an unprecedented museum experience.

The exhibit and circulation spaces in the building will have a playful, fluid, sculpted, organic character, with walls, floors, and ceilings flowing into one another seamlessly. "Plug-and-Play" technology will be integrated into many of these surfaces, allowing display modules to rise from the floor or hang from the ceiling. These modules can display actual artifacts with complex digital overlays and will act as portals into the museum's virtual spaces.

Outside of the primary exhibit space, the building will feature a 300-seat auditorium that will allow still and video images to be projected on its walls, ceiling, and floor. A virtual reality chamber will allow visitors and researchers alike to interact with digital versions of biological specimens from the collections. Viewers could see digital representations of brain activity or other organic functions as transmitted by sensors from a living subject.

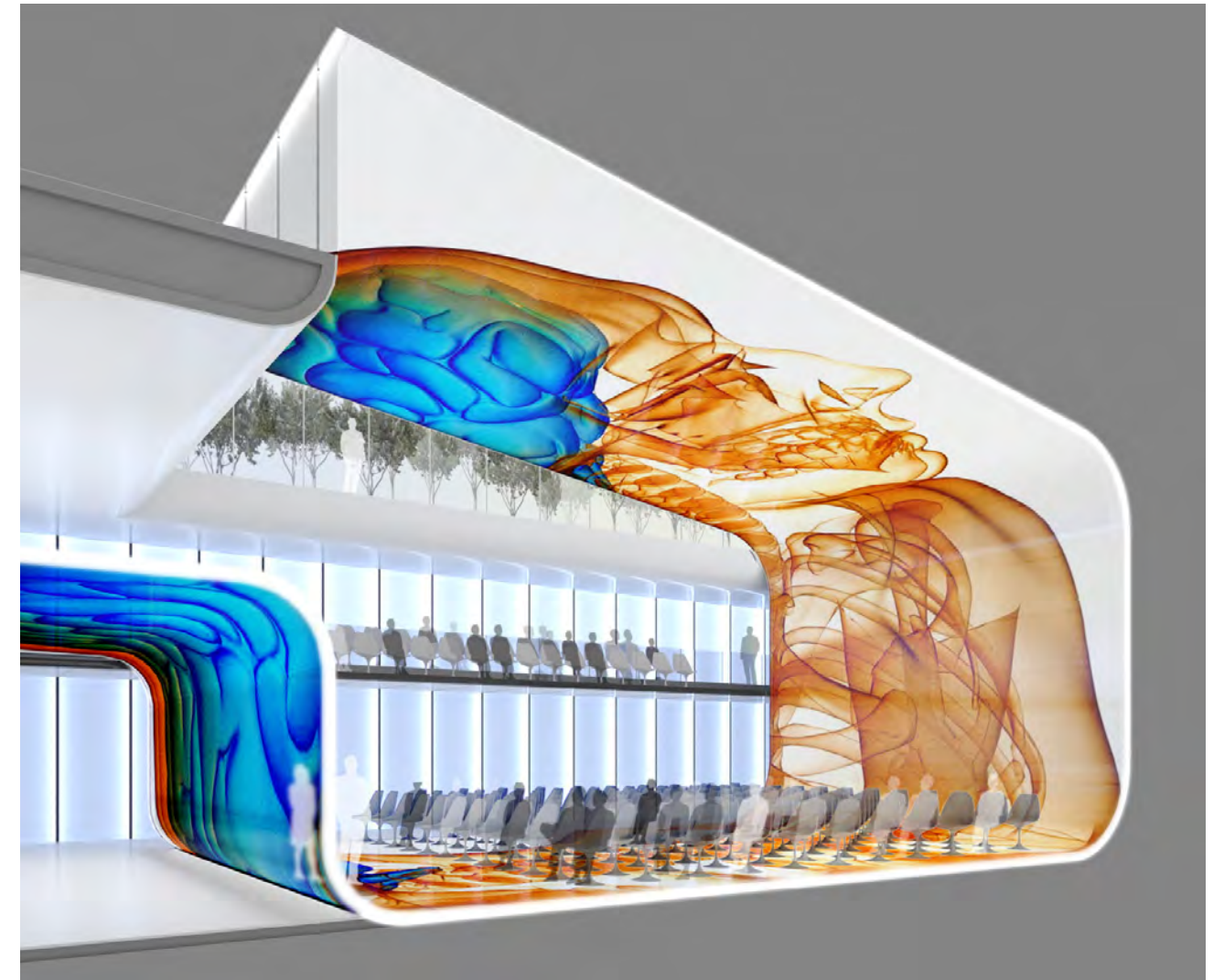


Image: © Adrian Smith + Gordon Gill Architecture

## FLEXIBLE, CUSTOMIZED, EVOLVING LEARNING EXPERIENCE

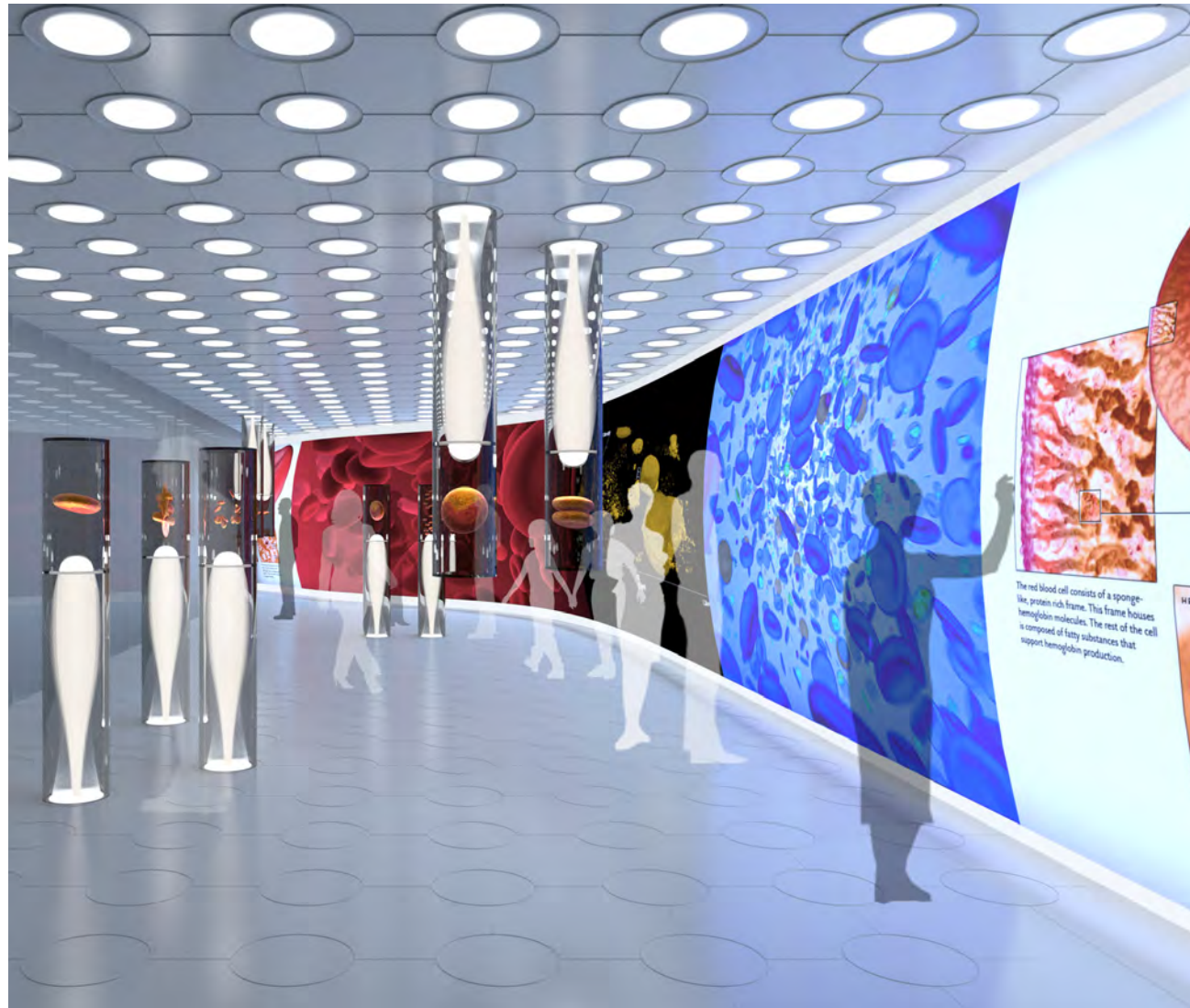


Image: © Adrian Smith + Gordon Gill Architecture

The exhibits themselves will take full advantage of the dynamic configurability of the museum's architecture and state of the art systems.

As visitors enter the exhibit space, they can check out headphones with integrated RFID chips and make a selection from a variety of virtual exhibits. As they move through the space, their presence will be detected and tracked, sending a signal to the display surfaces to configure to the specific content selected by that user. This will allow two visitors walking through the museum just moments apart to see completely different exhibits in the same location.

By utilizing this cutting-edge display technology, even a small institution can draw from a potentially limitless digital archive of content to provide a total exhibit capacity that can far exceed even the largest conventional museums. This approach can utilize the NMH+MC's collections in unprecedented ways.

Take for example, the field trip of a middle school classroom. A teacher logs in to the online museum several days in advance to plan a visit to the physical museum for her class. She uses the interactive tools to browse digital collections, selects a series of dynamic presentations, and registers her selections in the system.

When the class arrives at the museum, their headsets will cue the exhibits the teacher has selected to appear automatically as they move throughout the building. Concurrently, they can maintain a real-time dialogue with other students online through a video chat window that follows them as they explore the spaces.

Or, imagine an exhibit on neuroanatomy: with the nation's largest and most comprehensive brain collection as a source, the museum could generate images larger and more detailed than any others in the world. These artistic, technologically exquisite images could provide a stunning visual complement to exhibitions on the basic medical sciences. These installations could complement exhibits of other objects unique for their technical virtuosity, or be placed with real-time programming addressing global initiatives to promote the neurosciences.

The museum will also be equipped with a variety of cutting-edge experiential technologies, including spatial audio sound diffusion systems and variable pixel pitch systems to create high, low, and zero pixilation imagery at different viewing locations. This will allow the exploration of entirely new ways to present information to visitors.



## A HIGH-PERFORMANCE, SUSTAINABLE SOLUTION

The project will be an exemplar of green retrofits of existing buildings—a specialty of AS+GG, which is currently involved in a similar undertaking at Chicago’s Willis Tower, (formerly the Sears Tower). When completed, NMH+MC will be a state-of-the-art sustainable facility that takes full advantage of cutting-edge systems and strategies for maximum energy performance.

The foundation of NMH+MC’s green agenda is the adaptive re-use of the original building, a key principle of sustainable construction. The Washington Street façade, which will be visible through the translucent wrapper, will be refreshed by replacing missing portions and extending around to the east side, which is not currently exposed to public view.

AS+GG will investigate introducing natural daylight through the east and west outer walls of the building to illuminate the interiors, reducing the need for artificial lighting.

Inside, the building’s original mechanical, electrical, and plumbing systems will be updated to be sustainable and energy efficient. And new features—including a green roof, energy-efficient elevators, and high-performance lighting and glazing—will be added to significantly reduce energy use and the building’s carbon footprint.

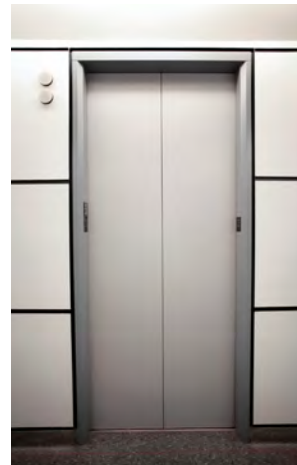
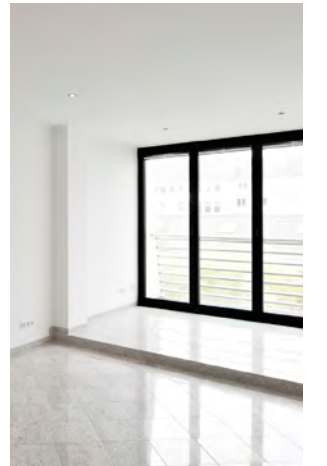


Image: © Adrian Smith + Gordon Gill Architecture



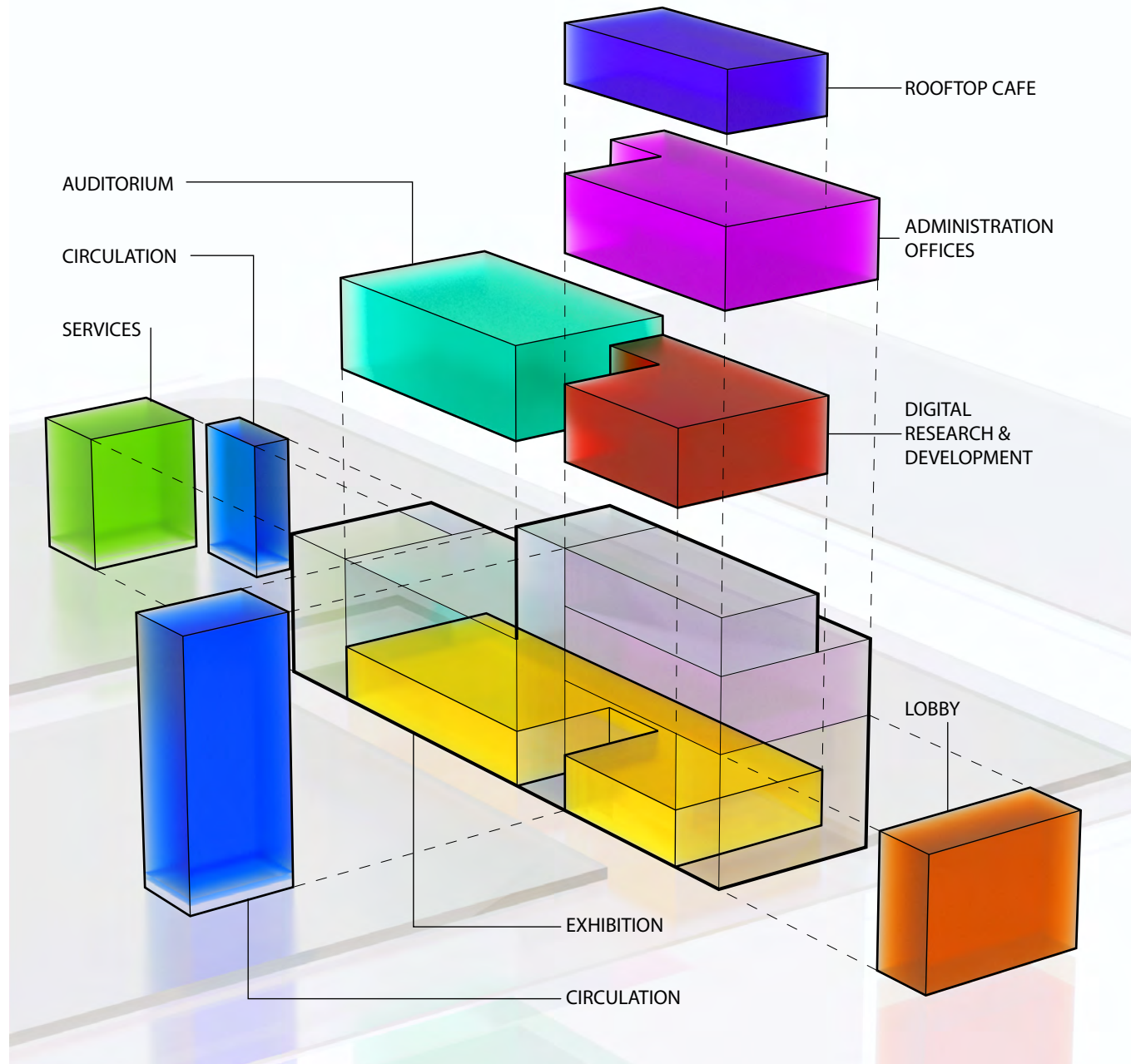


Image: © Adrian Smith + Gordon Gill Architecture

A REFLECTION OF THE PAST IN A VISION FOR TOMORROW

NMH+MC will take advantage of 21st century technology to create a museum experience unlike that of any other museum in the world.

The National Museum of Health + Medicine Chicago represents the synergistic convergence of efforts to advance the state-of-the-art in several areas: education, museum design, information science, community outreach, and architecture. Though sited in Chicago's Loop, this will truly be a museum without walls, projecting its influence across the world, and providing a rich immersive information experience to users no matter where they are located.

The Museum is currently undertaking to raise sufficient funding to complete the creation of the museum, and to set it on a course leading to financial self sustainability. The initial funding goal is to raise two million dollars within the first year of fundraising efforts. It is estimated that an additional forty-five million dollars will be required to complete construction of the museum by the spring of 2015.

For more information on the NMH+MC project, and to find out about donating, please contact :

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