

Gordon L. Freedman

Biography and Role in the Mitochondrial Research Community

Building Institutions at the Intersection of Science, Education, Technology and Public Engagement

Gordon L. Freedman is the founder and president of the [National Laboratory for Education Transformation \(NLET\)](#), a nonprofit research and development organization that develops new approaches to complex problems spanning education, workforce development, technology and biomedical research. He is also the founder of [MitoWorld](#) and a principal organizer of [MITOS.Global](#), initiatives created to strengthen communication, collaboration and innovation across the international mitochondrial community.

Freedman's career has been unusual in its range. He began in government and investigative work, serving on the staff of the U.S. Senate Watergate Committee and subsequently as a lead investigator for the U.S. House of Representatives. He later moved into journalism and media, including work as a producer at ABC News and as executive producer of the film adaptation of Stephen Hawking's *A Brief History of Time*.

His career subsequently shifted toward education, technology and institutional innovation. From 2005 to 2012, Freedman served as Vice President for Global Education Strategy at Blackboard, where he worked at the intersection of higher education, technology and large-scale digital transformation. He subsequently founded NLET to explore problems that are difficult for conventional institutions or commercial organizations to address alone.

NLET has worked across education, mathematics, workforce development, digital credentials, data systems and emerging technologies, supported at various times by federal agencies, foundations and institutional partners. Its work increasingly focuses on building connective infrastructure: bringing together research, data, technology, institutions and individuals that ordinarily operate in separate systems.

That same philosophy ultimately led Freedman into mitochondrial medicine.

A Personal Entry into Mitochondrial Disease

Freedman did not enter the mitochondrial field as a scientist seeking a new research specialty. He entered it as a person confronting mitochondrial disease and attempting to understand an extraordinarily complex scientific and medical ecosystem.

After developing a mitochondrial disorder, Freedman began the process familiar to many people affected by rare mitochondrial disease: attempting to understand a field

fragmented across genetics, metabolism, neurology, cell biology, aging, immunology and other medical specialties.

What began as an effort to understand his own condition gradually became a much broader investigation.

Freedman encountered a striking paradox. Mitochondria are fundamental to human biology, yet the people studying different aspects of mitochondrial function frequently operate in largely separate scientific communities. Researchers investigating inherited mitochondrial disease may have relatively little interaction with researchers studying mitochondrial metabolism in cancer. Scientists investigating mitochondrial dynamics, signaling, transplantation, immune function, aging or neurodegeneration may attend different conferences, publish in different journals and work through different institutional networks.

At the same time, discoveries in basic mitochondrial biology increasingly appeared relevant across many of these boundaries.

Freedman concluded that an important opportunity existed not to create another mitochondrial disease organization, but to create connective infrastructure for the broader mitochondrial field.

This became the foundation for [MitoWorld](#).

MitoWorld: Creating a Window into the Mitochondrial World

[MitoWorld.org](#) was established as an independent platform for communicating the rapidly evolving science of mitochondria and for introducing researchers, clinicians, patients, institutions and the interested public to the people and ideas shaping the field.

Its mission extends beyond conventional patient education.

MitoWorld treats mitochondria as a major scientific domain whose relevance now extends across inherited disease, metabolism, cancer, aging, neurodegeneration, immunity, exercise physiology, transplantation, mitochondrial transfer and emerging therapeutic technologies.

Through interviews, scientific discussions, profiles, explanatory material, conference coverage and [MitoBlog](#), MitoWorld attempts to make important mitochondrial work visible outside the specialized communities in which it originates.

A central element of this approach is direct engagement with scientists.

Rather than simply summarizing published research, MitoWorld seeks conversations with investigators about what they believe is changing, where the unresolved questions lie, and what discoveries in one mitochondrial discipline may mean for another.

[MitoBlog](#) complements this work by providing a continuing forum for following new research papers, profiling researchers and clinicians, examining laboratories and institutions, covering scientific meetings and placing individual discoveries within a larger mitochondrial context.

MitoWorld also organizes resources for the research and clinical communities, including information on [investigators, institutes, clinics and core facilities](#), and provides a bridge between the scientific community and people affected by mitochondrial disease.

The objective is not to compete with scientific journals, professional societies or disease organizations. It is to help connect them.

MitoWorld therefore occupies an unusual position between scientific communication, community building and research development.

MITOS.Global: From Communication to Collaboration

As MitoWorld developed, a second need became increasingly apparent.

Communication alone is insufficient when potentially important discoveries are occurring in laboratories that may have little institutional mechanism for working together.

[MITOS.Global](#) emerged to address this problem.

MITOS is being developed as a globally networked institute devoted to understanding mitochondria across health and disease and to integrating mitochondrial biology, bioenergetics, informatics, computation and translational research.

Where MitoWorld primarily makes mitochondrial science visible and understandable, MITOS.Global is intended to help investigators and institutions identify opportunities for **collaboration, validation, integration and translation**.

Its emerging network has involved investigators and institutions working in mitochondrial genetics, metabolism, cancer biology, mitochondrial transfer and transplantation, bioenergetics, computational biology and related areas.

The underlying concept is straightforward: mitochondrial biology increasingly crosses the organizational boundaries of conventional biomedical research.

MITOS.Global seeks to operate across those boundaries.

This can involve identifying investigators working on complementary problems, helping researchers find laboratories capable of independently testing findings, bringing technologies developed in one mitochondrial discipline into another, and assembling institutions around research questions that may be too broad for any single laboratory.

Freedman's role is therefore primarily that of an **institution builder, connector and translator rather than a laboratory scientist**.

His work focuses on understanding the landscape of mitochondrial research, identifying important investigators and emerging ideas, and creating structures through which those people and ideas can interact.

The Emerging Mitochondria–Cancer Initiative

One area in which this approach has become particularly important is cancer.

Cancer research has undergone a profound reassessment of mitochondria. Once viewed primarily through the simplified concept that cancer cells abandon mitochondrial respiration in favor of glycolysis, mitochondria are now understood to participate deeply in tumor metabolism, redox biology, biosynthesis, signaling, apoptosis, immune interactions, metastasis and treatment resistance.

At the same time, discoveries involving mitochondrial DNA, mitochondrial heterogeneity, intercellular mitochondrial transfer and metabolic adaptation raise questions that cross traditional disciplinary boundaries.

Freedman, MitoWorld and MITOS.Global have consequently begun developing a broader **mitochondria-and-cancer initiative**, including the concept of a **Mito-Cancer Atlas**. MitoWorld has begun using its publishing and convening platform to advance the concept of mitochondrial oncology and the need to systematically map mitochondria across cancer.

The proposed Atlas is not simply another database of cancer mutations. Its purpose is to begin systematically organizing what happens to mitochondria across cancer types, stages, cellular environments and treatments.

Among the questions are how mitochondrial DNA and function vary within tumors; how mitochondrial metabolism changes as cancers progress; how mitochondria interact with the tumor microenvironment and immune system; how mitochondrial transfer may contribute to tumor survival or recovery; and which mitochondrial characteristics create vulnerabilities that can be therapeutically targeted.

The ambition is ultimately to connect molecular findings with researchers, laboratories, datasets, technologies and clinical questions.

MITOS.Global is exploring how a network of major research institutions and investigators could contribute complementary capabilities to such an effort rather than attempting to centralize the project within a single institution.

A Convening Role Across the Mitochondrial Community

Freedman's position in the mitochondrial field is consequently somewhat different from that of a traditional research principal investigator.

Looking Ahead

Freedman believes mitochondrial science is entering a period in which discoveries historically separated by discipline will increasingly converge.