

Finding a cure for MS, one study at a time



People living with the disease join with research experts to identify projects to be funded.

by Aviva Patz

Can damaged myelin, the tissue that insulates nerve fibers, be repaired in multiple sclerosis?

Can altering the balance of gut bacteria help stop inflammation?

Is it possible to reprogram microglia, the brain's immune cells?

Are there early warning signs of multiple sclerosis before symptoms appear?

These are just some of the questions the National Multiple Sclerosis Society hopes to answer in its selection and funding of research to stop disease activity, restore function and end MS.

"The Society is one of the biggest funders of MS research in the world, making a multimillion-dollar investment annually in new and ongoing projects," explains neuro-immunology expert Etty (Tika) Benveniste, PhD, co-director of the UAB Multiple Sclerosis Center at the University of Alabama at Birmingham and chair of the Society's Scientific Advisory Committee.

The scope of research is broad, from fundamental basic science and translational science to clinical trials and rehabilitation studies. "That's important because, on one hand, we need to understand the most fundamental aspects of MS," Benveniste says. "But on the other hand, if someone does an exercise regimen three days a week and changes their diet, does that help

with quality of life?”

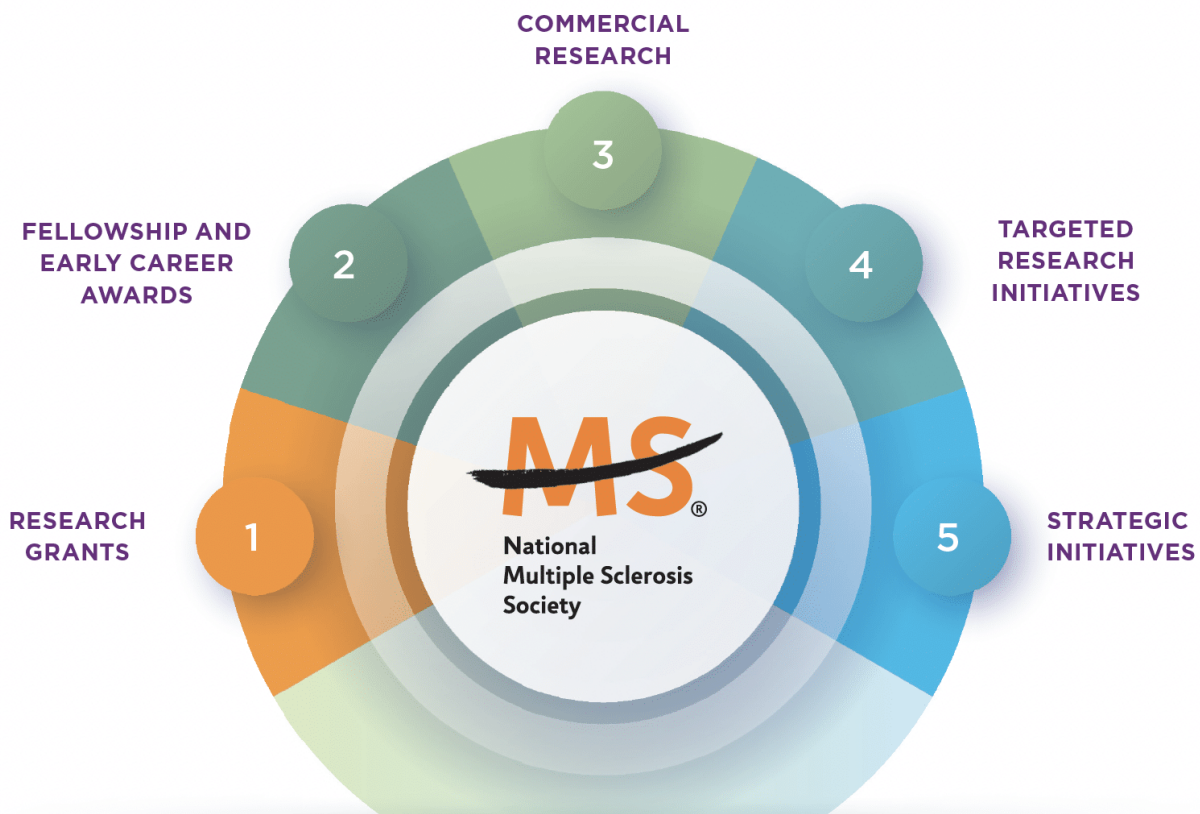
As part of the Pathways to Multiple Sclerosis Cures Initiative, the Society brings members of the MS community together with volunteer experts from around the country in diverse research disciplines — including neuroscience, radiology, immunology, cell and molecular biology, and physiatry (rehabilitation science) — to identify proposals with the greatest potential payoff.

Read on to learn more about the projects the Society funds, how they’re evaluated and selected, and the critical voices in this process.

Types of projects

In 2023, the Society added close to 70 new research initiatives, bringing the total number of active projects to about 200, or about \$70 million in multiyear investments, according to Bruce Bebo, PhD, executive vice president of Research for the Society.

FIVE TYPES OF FUNDED RESEARCH PROJECTS



“These investments are accelerating progress toward a better understanding of MS, which will lead to more treatments and eventually cures,” he says.

“They are part of a comprehensive global strategy for accelerating the Pathways to Cures research roadmap.”

Criteria for research projects

To qualify for funding, research projects must hit one of three “pathways” or goals that the Society outlines in its [Pathways to MS Cures Roadmap](#): (1) stopping MS disease activity, (2) restoring function by reversing damage and symptoms, or (3) ending MS by preventing new

cases.

To stop MS disease activity, one study is exploring factors that may predict onset of MS. A team at the Djavad Mowafaghian Centre for Brain Health at the University of British Columbia has already found that people who went on to develop MS were more likely to access the health system during the five years leading up to diagnosis, usually for sleep disorders, fatigue, anemia, pain, psychiatric disorders, prescriptions and hospitalizations. Using funding from the Society, the team will now use artificial intelligence to comb large volumes of medical records to pinpoint the early warning signs (also known as prodromal MS).

Another project designed to stop MS explored the role of the Epstein-Barr virus. In a 2022 study in *Science*, researchers used data from millions of U.S. military recruits over a 20-year period to determine whether Epstein-Barr causes MS. They found that while most people infected with Epstein-Barr don't go on to develop MS, having an Epstein-Barr infection (but not infections from similar viruses) increases the risk of developing MS 32-fold.

When it comes to restoring function, a team at the University of Connecticut Health Center is looking into why nerve-insulating myelin does not always regenerate after it's been damaged in people with MS, and how to remedy it. In studying skin cells from people with progressive MS, the scientists have found that the cells are much "older" than participants' biological age — and they've now identified a protein that may be to blame, and which could potentially be blocked, keeping cells younger and ideally enabling remyelination.

To prevent MS, there's research like that from the University of California San Francisco's Weill Institute for Neurosciences. They're searching blood samples of veterans, half of whom have MS and half of whom do not, for self-tissue-recognizing antibodies that could signal a predisposition to MS. If they can identify a biomarker for MS, they could potentially stop the disease before it starts.

How projects get selected

According to Bebo, it starts with the Society research staff team, which screens grant applications to ensure that they adhere to the Pathways to Cures Research Roadmap and that the applicants and their institutions are eligible to apply for funding through the Society.



There were about 200 active research projects in 2023.

Next, the Society recruits scientific peer reviewers, about 100 senior scientists from research institutions around the country who serve on peer review panels tasked with ranking the proposals based in scientific merit and relevance to the Pathways roadmap. Members of these panels have relevant expertise, whether it's in myelination, neuroinflammation, computational models of neural systems or other areas relevant to MS, to best evaluate the proposals.

"You read it and interrogate it, looking for strengths and weaknesses," explains John Lukens, PhD, associate professor of neuroscience at the University of Virginia and a member of Biomedical Research Committee B. "You put together a report based on the quality of the science and its potential impact on MS, scouring the literature to make sure it's novel and innovative. You look for possible flaws in the experiment design; for example, you might get data, but you wouldn't be able to interpret it because you don't have the right controls." Ultimately, the peer reviewers assign each grant application a score, and the ones that rank in the top 25% move on to community review.

In the third stage, applications that passed scientific muster get a review by the Society's Community Review of MS Research Committee, made up of people affected by MS. Their job, according to Bebo, is to prioritize the grants in order of excitement and interest by the MS community based on their lived experience, and to identify any patient concerns.

Community Review member Ryan Owings of Kansas City, who served on the initial committee, appreciates the diversity of perspectives even among the people affected by MS, which on one committee included 8 out of 10 people with MS, plus the mother of a daughter with MS and a husband of a woman with MS. "All of us have really have different viewpoints on how we think something could be beneficial," says Owings, who was diagnosed with

relapsing-remitting MS in 2012. “We have different cohorts — some of us are still working, others have cognitive deficit — and we don’t always think about the needs of other cohorts.”

Once the Community Review submits its list of priorities, Society leadership uses input from all these groups to decide which research projects to fund.

“But our work is not done once the projects are selected,” Bebo adds. “Scientific progress on all 200-plus projects in our portfolio is monitored on an ongoing basis during the lifespan of work by the research team.” The grantees and their institutions must also do regular financial reporting to ensure the Society’s investment is being used wisely.

The role of the MS community

Including the patient voice in the research process is critical because it connects science with the experience of living with MS, says Bonnie Higgins of Princeton, New Jersey, who was diagnosed with MS in 1994.

“There’s a saying: nothing about me without me,” says Higgins, who served for two years on the Community Review for MS Research Committee and is now a member of the Society’s Scientific Advisory Committee. “It’s about making sure patients have a say in what’s going on with their journey and their treatment. It’s crucial to hear that voice — to identify questions and assess possible outcomes.” Higgins notes that in reviewing grants, there are some things that “look great on paper” but seem too arduous for participants with MS. “You hate to see studies get to the point of trials with humans and patients don’t want to be involved,” she says.

For Owings, participation also means gaining deeper insight into and appreciation for the effort behind medical advances.

“It’s very easy to get frustrated that research does not move quickly enough,” Higgins says, “but here we can see all that goes into each and every study, the uncountable hours and the critical checkpoints along the way to enable patients to have a good, safe product in the end.”

“For me,” Higgins adds, “it’s the understanding that while you’re not going to get a cure tomorrow, there is progress. I come away from every session really optimistic about where we’re going and the science that the Society funds. True progress is being made.”

Aviva Patz is a writer in Montclair, New Jersey.

Learn more about the [Pathways to Multiple Sclerosis Cures Initiative](#).
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