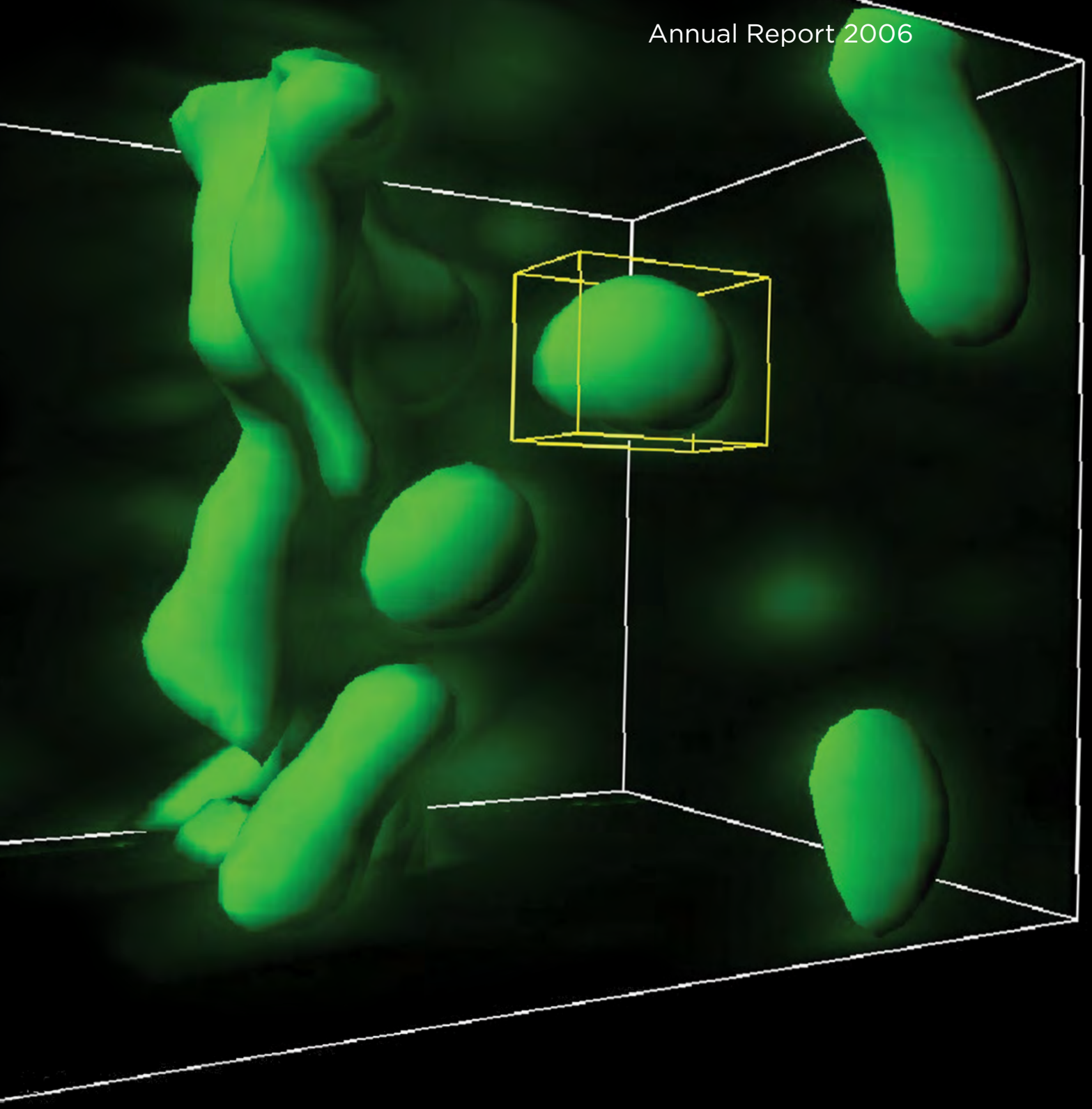


# Sustaining the Momentum

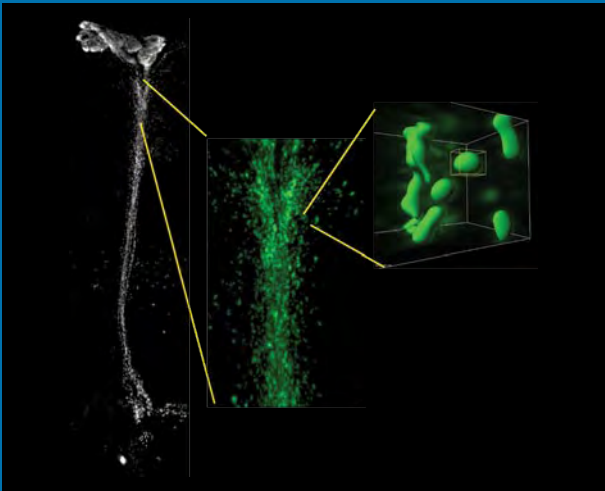
Annual Report 2006



# About the American Federation for Aging Research

The American Federation for Aging Research (AFAR) is a nonprofit organization whose mission is to support and advance healthier aging through biomedical research. We are devoted to supporting research that will lead to healthy, productive, and independent lives.

AFAR believes that a critical strategy for learning how to prevent and treat the diseases and disabilities of aging is to focus on understanding the aging process itself. At the same time, AFAR supports a wide range of basic, clinical, and health-services research, necessary to increase our chance of living healthier, longer.



Since 1981, AFAR has awarded nearly \$93 million to more than 2,200 talented researchers as part of our broad-based series of grant programs. Our work has led to significant advances in the understanding of the aging process, age-related diseases, and healthy aging practices. AFAR communicates news of these innovations to the public through our consumer newsletter *Lifelong*, organizational web site [www.afar.org](http://www.afar.org), and two educational web sites, Infoaging ([www.infoaging.org](http://www.infoaging.org)) and Health Compass ([www.healthcompass.org](http://www.healthcompass.org)).

"Insulin-producing cells in the brain of an adult fruit fly secrete insulin-like substances we can study [Left]. Exploring how these substances control aging in animal models may reveal the universal way such hormones modulate lifespan in mammals and how we might manipulate them to improve our own health during normal aging."

**Marc Tatar, Ph.D.**  
Professor  
Division of Biology and Medicine  
Brown University  
1996 AFAR Research Grant Recipient

Photo by **John Cumbers**

*"The aging of the American population, with its associated health policy and economic implications, is one of the nation's primary challenges in the 21st Century. This fact alone underscores the importance of AFAR's mission, the scientific advancement of healthier aging..."*

**Diana Jacobs Kalman**  
Chair of the Board



## Dedication



**Vincent Cristofalo, Ph.D., and Hinda Rosenthal**

This annual report is dedicated to the late Vincent Cristofalo, Ph.D., and Hinda Rosenthal, who both were long-time supporters of AFAR and our mission.

Dr. Cristofalo, a founding board member and past president of AFAR, was an internationally known leader in aging research and a pioneer in the field, who was instrumental in AFAR's

growth and development. He served as president of the Lankenau Institute for Medical Research and was the founding director of the Institute of Aging at the University of Pennsylvania. He also was the founding director of the Institute of Aging at the Medical College of Pennsylvania. At the time of his death, he was a senior investigator at Lankenau and a professor of pathology, anatomy, and cell biology at Jefferson Medical College.

As president of the Richard and Hinda Rosenthal Foundation, Hinda Rosenthal was committed to the ideal that those who secure unusual benefits from society

have the obligation to give a significant portion back. The Foundation's Awards in Medicine have made notable contributions to improved clinical treatment in cancer, cardiovascular disease, internal medicine, and in the delivery of patient treatment. The Foundation's uninterrupted support of AFAR began in 1995.

We extend our deepest gratitude to Dr. Cristofalo and Mrs. Rosenthal for their contributions and work on behalf of AFAR. Their lives and actions represented the very best of the scientific and lay funding communities—the twin pillars of the field of aging research.

# Great Promise...Worth Keeping

To paraphrase Charles Dickens, it is the best of times, and in some ways, the worst of times for aging research. It is a moment of great promise as each day researchers supported by the American Federation for Aging Research (AFAR) and others advance our understanding of age-related illnesses such as Alzheimer’s disease, Parkinson’s disease, heart disease, cancer, and diabetes—as well as our basic knowledge of the aging process. But it is also a time of great unease.

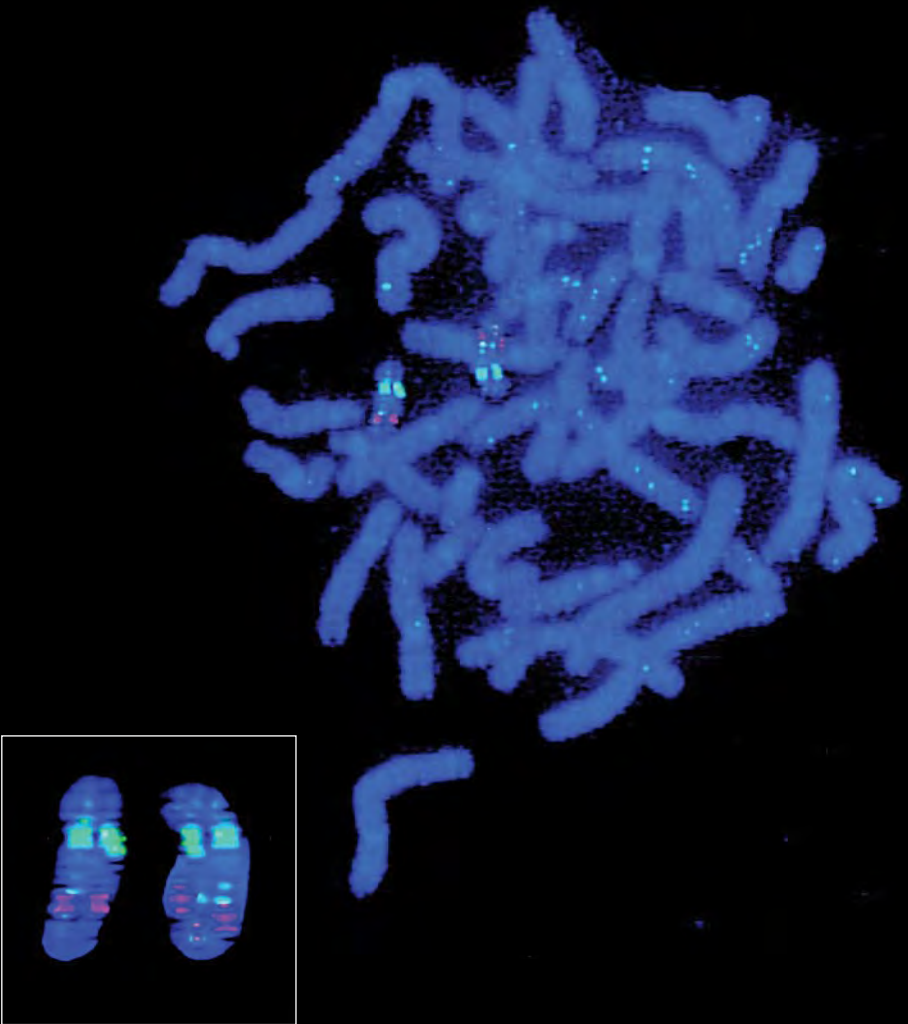
Between 2000 and 2005, Congress approved a dramatic doubling of the budgets of the National Institutes of Health (NIH), which includes the National Institute on Aging (NIA). Lawmakers were at once seeking a strategy to address the health needs of an aging population and energized by the new insights biomedical research was producing. In response, academic medical centers expanded, investing in new technologies and supporting more scientists and science. This was good news for us at the American Federation for

Aging Research because our main programs provide seed funding for talented, emerging scientists, more than 90% of whom go on to receive federal funding. Then in fiscal years 2006 and 2007, the increase in federal investments in research stalled, failing to grow as fast as inflation, and more importantly, failing to keep up with the accelerating pace of scientific advancement.

This has had important implications for research and researchers, notably those in the aging field. Since 1997, even before the dramatic growth in the NIH’s budget, research grant applications submitted to NIA had a one-in-three chance of getting funding. Today, a grant applicant’s chances are just 18 percent, less than one in five. This means good science, promising science, is going unfunded, and an increasing number of researchers are forced to leave productive careers in academia. At the same time, NIH is compelled to use scarce resources to shepherd more conservative experiments through large institutions rather than support

smaller, riskier projects that might produce the breakthroughs we all desire.

Although Congress approved legislation in the most recent budget that authorizes somewhat higher allocations for NIH and NIA, future appropriations are still uncertain. In the meantime, faced with the current funding limitations, researchers are increasingly turning to private organizations like AFAR for support. In fact, some of the best research in the field has been done with private funding, which can be directed more easily toward either basic or translational research as needed. In this turbulent period, AFAR continues to press forward, supporting the careers of promising scientists dedicated to unlocking the mysteries of aging and improving the healthcare of older Americans.



The light blue dye highlights the *LASS1* gene, the homologue of the yeast longevity gene *LAG1*, on chromosome 19, which is marked by the red stain. “We are making headway in understanding how both genetics and the environment interact to influence the way we age. Eventually, we hope to develop the ability to intervene positively in that interaction. Our mission is for everyone to die young at an old age.”

**S. Michal Jazwinski, Ph.D.**  
Professor of Biochemistry and Molecular Biology  
Co-Director, Center on Aging  
Louisiana State University Health Sciences Center-  
New Orleans  
1989 AFAR Research Grant Recipient

Photo Credit: JC Jiang et al. (1998)  
*Genome Res.* 8: 1259.



## Making the Most of Exciting Times

Approximately 78 million Americans were born from 1946 to 1964. This group, the so-called Baby Boom Generation, represents more than a quarter of our nation's population. As they reach older adulthood, Boomers will continue to have enormous impact on every aspect of our culture, government, and economy. The healthcare system, in particular, will likely confront challenges on a scale never seen before, as the incidence of age-associated diseases swells to staggering numbers.

We can wait and try to meet these problems as they occur—which may prove an overwhelming and impossible task—or we can face them squarely now. We can advance our scientific understanding of the aging process and

the ills that often come with it. We can search for interventions that delay or even prevent disease or decline as we grow older. This is the work of AFAR—to extend the health span of individuals, improve their quality of life, and reduce the public and private costs of an aging society. We have already made phenomenal progress toward these ends, but the prospects for the future are less certain.

The field of aging, like other biological and health sciences, is straining to move rapidly forward, while at the same time, federal funders are stepping on the brakes. As noted in our introduction, federal support for research has stalled in the last two years. Private funders—corporations, foundations,

and individuals—cannot fully fill the gap left by a flat NIH budget. But private funding is crucial if the science of aging is to continue. We all have a role to play to create the kinds of exhilarating developments we find chronicled almost daily in the press, some of which are described throughout this report.

AFAR has taken up the challenge by continuing to expand our role in fostering the careers of talented, early-career researchers and by building on the knowledge and network gained over a quarter century. Many of the scientists whom AFAR supported during our first 25 years are now leaders in the field.



"We put mice on a standard diet [Far Left], high-calorie diet [Middle Left], and high-calorie diet plus resveratrol [Near Left], a substance that seems to activate pathways that promote longevity and protect the animal from several diseases of aging. Drugs that slow the aging process may be achievable."

**David Sinclair, Ph.D.**

Associate Professor of Pathology  
Harvard Medical School  
Co-Director of the Paul F. Glenn  
Laboratories for the Biological  
Mechanisms of Aging  
2000 AFAR Research Grant Recipient

Photo by **Doug Hansen**

*"There is so much hope, so much possibility in aging research today. What we need is the support, the personal generosity, the political will to translate that hope into new knowledge, new approaches, new drugs and interventions."*

**Stephanie Lederman**  
Executive Director



To sustain this momentum, AFAR continues to seek new partners and new programs and to invest in the careers of early-career scientists. In 2006, a developing interest in the frontiers of neuroimaging and aging yielded several exciting developments. Notably, AFAR sponsored an *Imaging and the Aging Brain* conference, along with the New York Academy of Sciences (NYAS). Some of the field's most highly respected researchers presented findings from the forefront of this research. AFAR also partnered with NYAS and GE Healthcare to create the AFAR-NYAS-GE Healthcare Neuroimaging Prize for Junior Investigators, which made four awards to talented, emerging researchers.

Other new AFAR-supported programs include the Fannie E. Rippel Foundation/AFAR New Investigator Awards on Gender

Differences in Aging, and the Rosalinde and Arthur Gilbert Foundation/AFAR New Investigator Awards in Alzheimer's Disease. We welcome these new collaborators and collaborations, while noting our steadfast supporters listed in full on pages 18 and 19.

One of AFAR's greatest strengths lies in our tremendous volunteer leadership as exemplified by the members of our board of directors. Therefore, we would like to thank outgoing president Mark H. Beers, M.D., for his service to AFAR and the field. He has been an able and energetic advocate for aging research and spokesman before the scientific community. We would also like to welcome incoming president Terrie Fox Wetle, Ph.D., of Brown University, and five new board members in 2006: John M. Bonk of P.G.B. Trust; Helen K. Edelberg, M.D.,

M.P.H., of sanofi-aventis; Roger McCarter, Ph.D., of Penn State University; John B. Rhodes, of Booz-Allen Hamilton (retired); and Joyce Yaeger of M. Booth & Associates. We look forward to their contributions to AFAR's important work. And as of this publication date, we also welcome newly elected 2007 board members Steven Austad, Ph.D., of the University of Texas; Jay Edelberg, M.D., of GlaxoSmithKline; William Lipton, of Ernst & Young LLP (retired); and Alastair J.J. Wood of Symphony Capital.

We at AFAR remain committed to doing all we can to support and sustain researchers and their efforts in the years ahead. There remains much to do to ensure that we realize the hope that aging research labs are generating every day. We invite you to join us in making the most of the promising and exciting times ahead.

# Forward Progress: Program Highlights

## Events and Education

### AFAR Celebrates 25 Years of Advancing Great Minds in Science

On May 15th, more than 170 people turned out to celebrate AFAR's 25th anniversary. With the theme *Advancing Great Minds*, AFAR honored prominent leaders, including Nobel laureate Joshua Lederberg, Ph.D., from the corporate, scientific, and foundation communities. The event raised more than \$230,000, all going toward the support of the AFAR Research Grants program, which funds early-career scientists studying the biology of aging and age-related diseases and disorders.

### Scientific Meeting: Imaging and the Aging Brain

Also in May, Nobel laureate Eric Kandel, M.D., joined leading neuroscientists and industry experts to speak at the *Imaging and the Aging Brain* conference, sponsored by AFAR and the New York Academy of Sciences and held at New York University's Kimmel Center. Conference presentations focused on recent technological advances in brain imaging and how imaging is transforming the way researchers understand normal and pathologic aging processes.

### Why We Age Media Luncheon Series

With support from Pfizer Inc, AFAR ran a provocative educational series on a range of topics in aging research for members of the media. These included:

- *Why We Age: The Cancer/Aging Paradox*
- *Rats, Cats, and Bats: What the Natural World Can Teach Us About Improving Health and Extending Life*
- *You Must Remember This: The Aging Brain in the Boomer Years*
- *What Becomes of the Broken-Hearted? The Future: Repairing from Within*

### Infoaging Update and Expansion

Since 1999, Infoaging.org has served as an easy-to-understand, consumer web resource on the latest research about the biology of aging, age-related diseases, and healthy aging. This year, with additional support from Pfizer Inc, AFAR installed a variety of new interactive capabilities to better serve the hundreds of thousands of people who use the site each year. It is also updating the site's 35 information centers to ensure Infoaging.org continues to provide the most up-to-date, credible news possible on the field.

## New Grant Programs

### AFAR/Pfizer Research Grants

Pfizer Inc committed to supporting six AFAR Research Grants, worth \$60,000 each. These junior faculty awards (see page 10), part of AFAR's flagship research program, will fund researchers examining both the basic biology of aging and age-related aspects of disease.

### Rosalinde and Arthur Gilbert Foundation/AFAR New Investigator Awards in Alzheimer's Disease

This new program supports research into the prevention, diagnosis, and treatment of Alzheimer's disease. The program also encourages junior investigators in the United States and Israel to pursue research and academic careers in the neurosciences, and Alzheimer's in particular. Up to five one-to-two-year awards of \$60,000 each will be awarded.

### The Fannie E. Rippel Foundation/AFAR New Investigator Awards on Gender Differences in Aging

This new program provides two awards of up to \$60,000 each to junior faculty committed to pursuing careers in gender-based aging research. The program encourages scientific investigation leading to a better understanding of normal biological aging, as well as gender-related mechanisms underlying diseases and disorders associated with aging.

### The Paul Beeson Career Development Awards in Aging Research Program: Extension to the Island of Ireland

The Paul Beeson Career Development Awards in Aging Research Program continues to create a cadre of leading physician-scientists who are committed to academic careers in aging-related research, teaching, and practice. This year, with support from The Atlantic Philanthropies, the program went international, providing one award of up to approximately \$450,000 to an outstanding junior physician faculty member chosen from throughout Ireland.

### AFAR-NYAS-GE Healthcare Neuroimaging Prize for Junior Investigators

Four neuroscientists were awarded the first AFAR-NYAS-GE Healthcare Neuroimaging Prize for Junior Investigators. The \$1,500 award, sponsored by AFAR and the New York Academy of Sciences, was established by GE Healthcare as a way to support and recognize outstanding academic and scientific accomplishments in the area of neuroimaging.

### Affiliate Grants

AFAR's affiliate programs supported exciting new science in 2006. Two grants were awarded through our Southeastern affiliate at Emory University. Kreton Mavromatis, M.D., received funding to study the effects of age on endothelial progenitor cell mobilization in humans, and Zhi Qiang Qu, M.D., Ph.D., to study the mechanisms of Best Vitelliform Macular Dystrophy. AFAR's Ohio affiliate awarded a grant to Jonathan Godbout, Ph.D., at Ohio State University. He received funding to study the relationship between aging, cytokines, and depressive behavior.

## From AFAR's Labs: Grantee Highlights

Many AFAR grantees are gaining broad attention both in top scientific journals and high-profile consumer media, expanding the knowledge we all need to live well longer. Some highlights from 2006 include:



Findings by 2000 AFAR Research Grant recipient **David Sinclair, Ph.D.**, about the beneficial role of resveratrol on health and lifespan, generated worldwide media attention in the fall of 2006. In a paper published in the November 2 issue of *Nature*, Dr. Sinclair and colleagues at Harvard Medical School found that high doses of resveratrol, a substance found in red wine, can prevent early deaths in mice fed a diet so high in calories that they became obese. The study provides encouragement to scientists who are trying to develop drugs to prevent diseases like heart disease and diabetes that are associated with obesity in people.



Research by 2003 Beeson Scholar **Norman Sharpless, M.D.**, published in the September 6 issue of *Nature* and featured in *The New York Times* and several other media outlets nationwide, found that the removal of a cancer-fighting gene slows the process of aging. In an effort to prevent cancer, this gene stops our stem cells' ability to duplicate as we age. Dr. Sharpless found that in animals that lacked this gene, stem cells continued to divide and renew, preventing the tissue deterioration that occurs with normal aging.



Five AFAR-supported researchers, including **Dellara Terry, M.D.**, a 2005 Beeson Scholar at Boston University, **Thomas Johnson, Ph.D.**, a 1986 and 1987 AFAR Grantee at the University of Colorado, and **Daniel Promislow, Ph.D.**, a 1996 AFAR Grantee at the University of Georgia, were featured in the September/October 2006 special healthy aging issue of *AARP: The Magazine*. The article highlighted advances in biomedical aging research over the last two decades.



**Mary Whooley, M.D.**, a 2001 Beeson Scholar and 1998 AFAR Research Grant recipient, published a comprehensive review of studies linking depression and heart disease in the *Journal of the American Medical Association*. This work was featured in several television, internet, and print news sources. Dr. Whooley, an assistant professor of medicine at the University of California, San Francisco, and internist at the San Francisco Veterans Affairs Medical Center, found that depression is far more prevalent in heart patients than in the general population.



Beeson Scholar **Anne Louise Oaklander, M.D., Ph.D.**, was interviewed for a May 30 article in *The New York Times*. Dr. Oaklander, a leading pain expert, talked about

findings from her recent article in the 2006 issue of *Pain*. This work demonstrated that complex regional pain syndrome (CRPS-I), a mysterious pain syndrome that affects approximately one million Americans, is due to a physical abnormality in the nerves and is not psychosomatic, as previously thought. Dr. Oaklander is the director of the nerve injury unit at Massachusetts General Hospital and an associate professor of neurology and assistant professor of anesthesia at Harvard University.



**Nir Barzilai, M.D., Thomas Johnson, Ph.D., and Richard Miller, M.D., Ph.D.**, were featured in the March issue of *The Scientist*, discussing the future of aging research and its impact on an aging society. Dr. Barzilai (top left), a Beeson Scholar and AFAR Research Grant recipient, commented on a diabetes drug that may affect aging



and age-related diseases, while Drs. Miller (below left) and Johnson—also AFAR Research Grant recipients—weighed in on the future of biomarkers in aging. Dr. Miller also wrote the cover article about the impact of aging research on disease, public health, and the future.



Two-time AFAR grant recipient **Adam Gazzaley, M.D., Ph.D.**, was featured in *The Wall Street Journal's* March 3 Science Journal article on the aging brain. A recent study published

by Dr. Gazzaley, recipient of a 2005 AFAR/Pfizer Innovations in Aging Research Grant and a 2002 Glenn/AFAR Research Grant for Post-doctoral Fellows, suggests that older adults do not filter out irrelevant information as well as their younger counterparts, and this extraneous information affects their short-term memory and reasoning.



Throughout the month of March 2006, **Frank LaFerla, Ph.D.**, was featured in several online media—including SciAm.com, Forbes.com, and BBC Online—for his recent

breakthrough in a possible Alzheimer's disease treatment. Dr. LaFerla, recipient of a 2000 AFAR/Pfizer Research Grant in Age-Related Neurodegenerative Diseases, found that a drug may block the progression of Alzheimer's by preventing the buildup of protein plaques and tangles in the areas of the brain that are predominantly affected by the disease. The drug also appears to reverse Alzheimer's-related cognitive decline.



## Building Future Careers in Aging Today: Grant Programs

In 2006, the American Federation for Aging Research conducted a range of grant programs for medical and graduate students, fellows, and junior faculty. All of these efforts have been designed to attract the most talented new scientists to the field and help them launch careers in aging research.

### AFAR Research Grants

Our flagship program, the AFAR Research Grant program, provides up to \$60,000 for a one-to-two-year award to junior faculty (M.D.s and Ph.D.s) to conduct research that will serve as the basis for longer-term research efforts. AFAR-supported investigators study a broad range of biomedical and clinical topics, including the causes of cellular senescence, the role of estrogen in the development of osteoporosis, the genetic factors associated with Alzheimer's disease, the effects of nutrition and exercise on the aging process, and much more. Major supporters of AFAR Research grants include: The Marion Esser Kaufmann Foundation, the Glenn Foundation for Medical Research, David W. Gore, F. M. Kirby Foundation, the Partners of Goldman Sachs & Company, and The Starr Foundation. Collaborating donors include Diane A. Nixon, Joseph L.K. Snyder Trust, Pfizer Inc, The Richard and Hinda Rosenthal Foundation, and The Irving S. Wright Endowment.

### The Julie Martin Mid-Career Award in Aging Research

Sponsored by the Ellison Medical Foundation, this program encourages outstanding mid-career scientists who have not been engaged in aging research but whose research is relevant and could lead to novel approaches to aging. Also eligible are aging researchers whose research is high risk, and thus not attractive to NIH or other traditional sources, but has the potential for high payoff in advancing our understanding of basic aging. Two four-year awards of \$550,000 are made annually.

### Paul Beeson Career Development Awards in Aging Research Program

The National Institute on Aging, the NIH Office of Dietary Supplements, the John A. Hartford Foundation, The Atlantic Philanthropies, The Starr Foundation, and an anonymous donor are collaborating on this initiative to sustain and promote the careers of clinically trained individuals who are pursuing research in aging. The award has recently expanded to include one recipient on the Island of Ireland.

### Glenn/AFAR Breakthroughs in Gerontology (BIG) Awards

Sponsored by the Glenn Foundation for Medical Research, the Glenn/AFAR BIG program provides timely support to a small number of pilot research programs that may be of relatively high risk but offer the significant promise of yielding transforming discoveries in the fundamental biology of aging. Up to four two-year grants of up to \$200,000 are awarded annually.

*"The science of aging has entered an extraordinarily productive period. We are generating new insights every day."*

**George M. Martin, M.D.**  
Scientific Director, AFAR



### Ellison Medical Foundation/AFAR Senior Postdoctoral Fellows Research Program

This program encourages and furthers the careers of postdoctoral fellows (both M.D.s and Ph.D.s) with at least three and not more than five years of prior postdoctoral training in the fundamental mechanisms of aging. Up to three two-year fellowships of \$100,000 are awarded annually.

### Medical Student Training in Aging Research (MSTAR) Program

To encourage medical students—particularly budding researchers—to consider a career in academic geriatrics, this program awards short-term scholarships. AFAR has partnered with the NIA and several foundations to continue to strengthen the original Hartford/AFAR Medical Student Geriatric Scholars Program. Participating foundations include the John A. Hartford Foundation, the Cleveland Foundation, the Cardinal Health Foundation, the Lillian R. Gleitsman Foundation, Community Health Foundation of Western & Central New York, the New York Community Trust, and an anonymous donor.

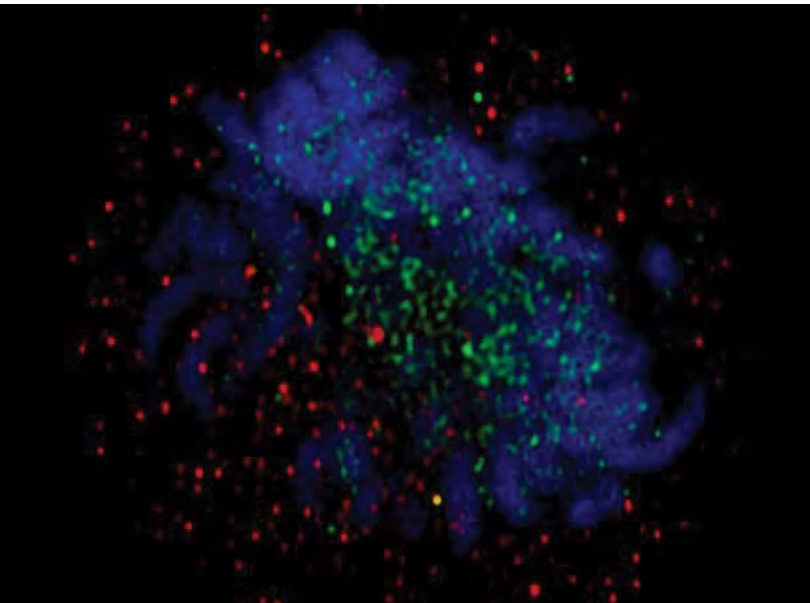
### AFAR/Pfizer Innovations in Aging Research Award

Since 2004, AFAR has partnered with Pfizer Inc to make 12, \$200,000, two-year awards to promising junior faculty wanting to start highly innovative projects focused on the basic biology of aging and its relationship to human disease.

### Centers of Excellence Network Resource Center

Since 2005, with support from the John A. Hartford Foundation, AFAR has served as the Network Resource Center for the Foundation's 24 Centers of Excellence (CoEs), recognized for their considerable capacity to recruit and develop physician leaders in geriatrics. The role of the Network Resource Center is to facilitate communications among the CoEs and to identify and disseminate tested approaches in geriatrics recruitment and career development. Three major products on these topics are planned between now and 2008.

# Finding the Best and Brightest: The AFAR Review Process



Sirt1 enzyme/protein, which helps control the pace of aging, is in green, the nucleus is in red, and the DNA is in blue [Left]. “Now that we have small molecules that extend lifespan, drugs to treat diseases and extend healthy lifespan may be just around the corner.”

**David Sinclair, Ph.D.**  
Associate Professor of Pathology  
Harvard Medical School  
Co-Director of the Paul F. Glenn  
Laboratories for the Biological  
Mechanisms of Aging  
2000 AFAR Research Grant  
Recipient

Each year, AFAR receives five to seven times as many qualified research proposals as can be funded. We use a rigorous review process and ultimately fund a small percentage of these high-quality proposals. The AFAR National Scientific Advisory Council (NSAC), consisting of more than 200 of the nation’s leading researchers in aging and aging-related fields, carefully considers each proposal’s scientific merit. The size and expertise of the NSAC is critical as AFAR welcomes proposals within the entire spectrum of the biology of aging. Volunteer members of this diverse panel

screen, read, and score the applications before referring them to AFAR’s Research Committee. After another two-day deliberation, the Committee then recommends finalists. Since 2002, Richard A. Miller, M.D., Ph.D., has chaired this committee. Beginning in 2007, Roger McCarter, Ph.D., will serve as chair.

In the case of AFAR’s grant programs, scientists with an expertise applicable to the particular grant program evaluate the applications in a similarly rigorous fashion. To benefit from these high-quality administrative skills and review processes, many

foundations, individuals, and corporations turn to AFAR to manage their research grant programs. AFAR’s excellent reputation is due in large part to the committed work of the senior researchers in our network, who are listed here.

## 2006 AFAR Research Committee

Richard A. Miller, M.D., Ph.D.,  
Chair  
Judd Aiken, Ph.D.  
Adam Antebi, Ph.D.  
Andrzej Bartke, Ph.D.  
Jay M. Edelberg, M.D., Ph.D.  
David Fink, M.D.  
Suzanne Guenette, Ph.D.  
Patrick R. Hof, M.D.  
Peter Hornsby, Ph.D.  
Fernando Macian, M.D., Ph.D.  
Roger Mccarter, Ph.D.  
James Nelson, Ph.D.  
Lina Obeid, M.D.

## 2006 National Scientific Advisory Council

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Julie K. Andersen, Ph.D.  
Katrin Andreasson, M.D.  
Abraham Aviv, M.D.

**B**  
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Nir Barzilai, M.D.  
John Baum, M.D.  
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Mary Kay Francis, Ph.D.  
Sally Frenkel, Ph.D.  
Karyn M. Frick, Ph.D.  
Matthew P. Frosch, M.D. Ph.D.

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Debra A. Gearhart, Ph.D.  
Bill Gehring, Ph.D.  
Godfrey S. Getz, M.D., Ph.D.  
Thomas M. Gill, M.D.



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Todd Golde, M.D., Ph.D.  
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Gunnar K. Gouras, M.D.  
Lotta Granholm-Bentley, Ph.D., D.D.S.  
Claudia Gravekamp, Ph.D.

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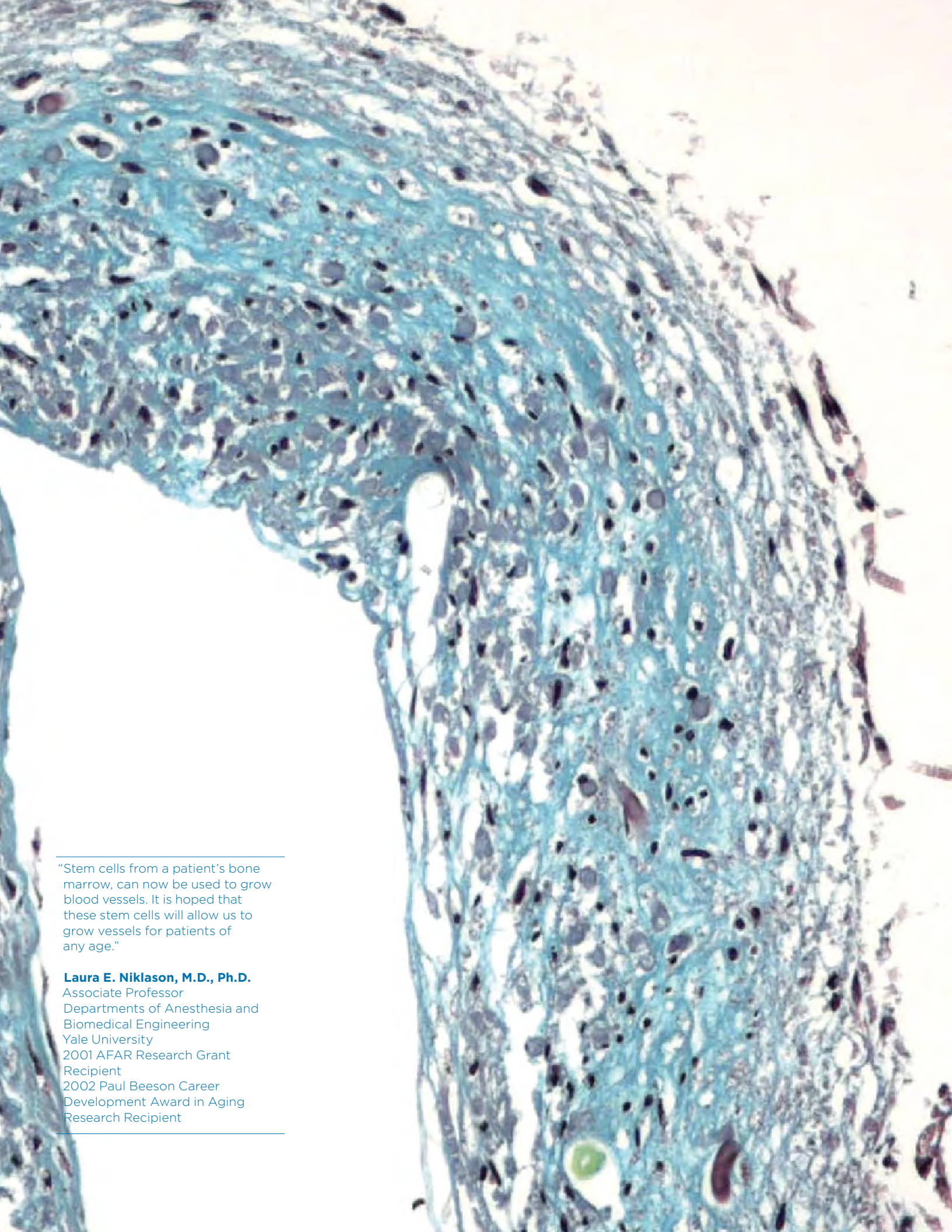
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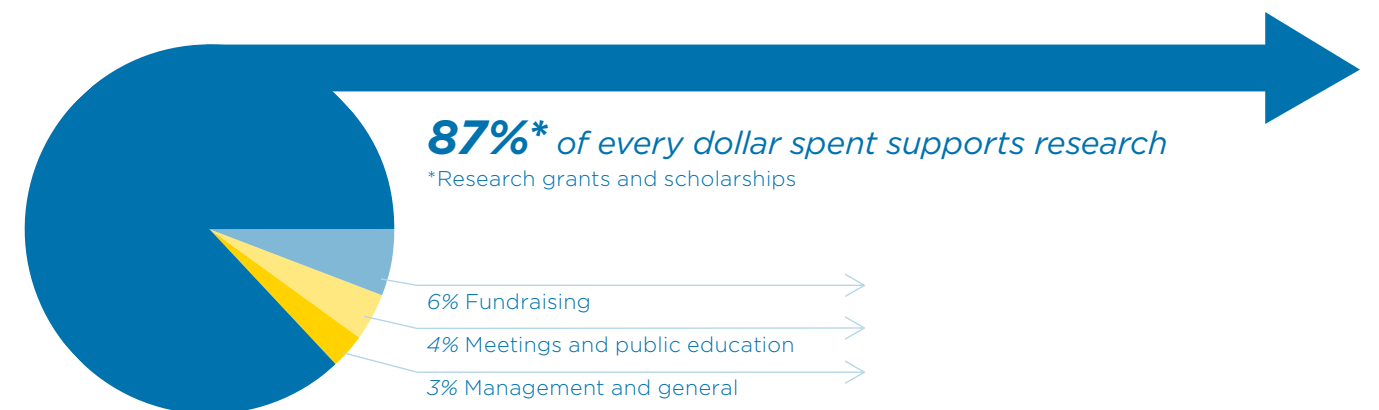




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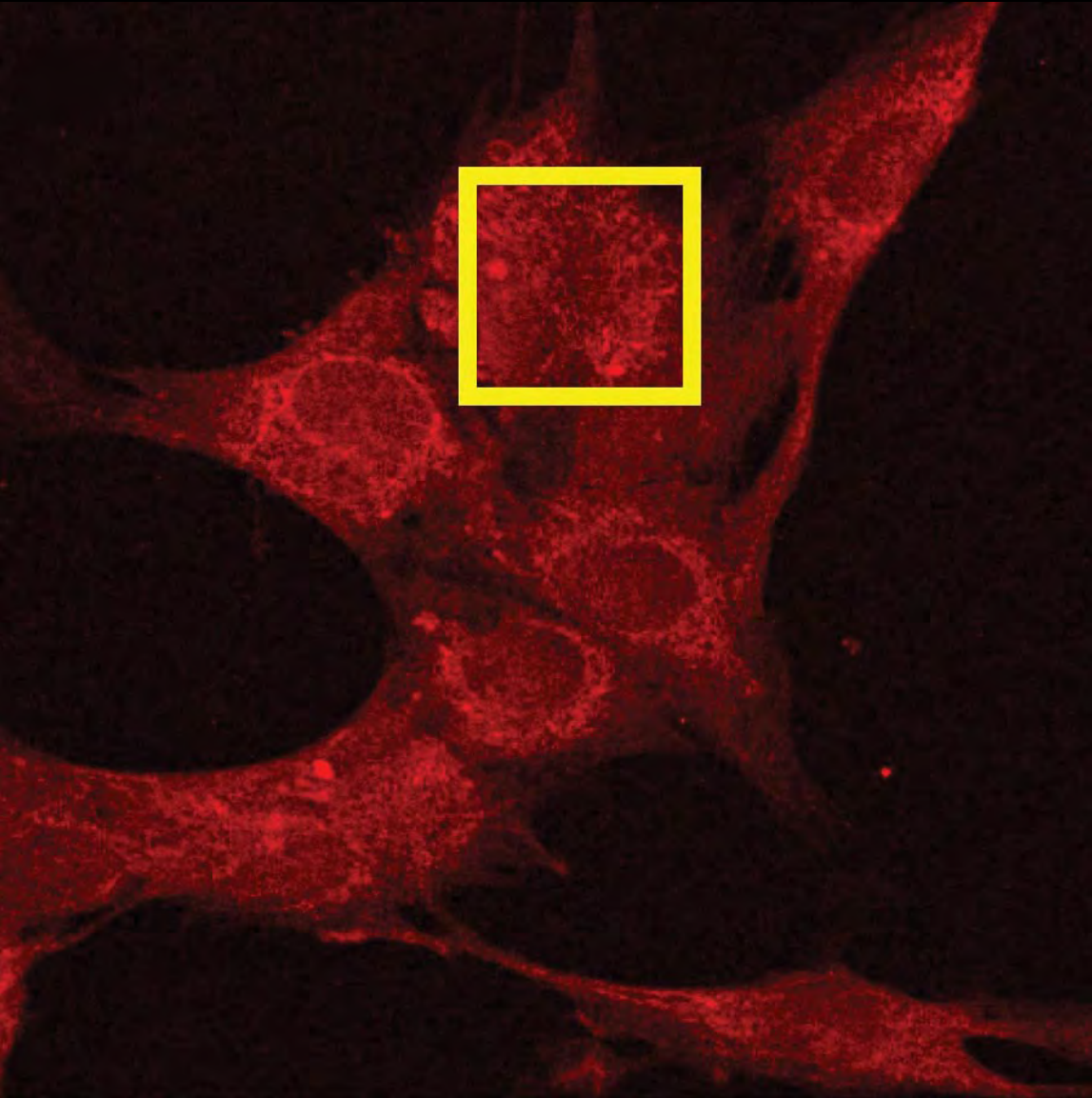
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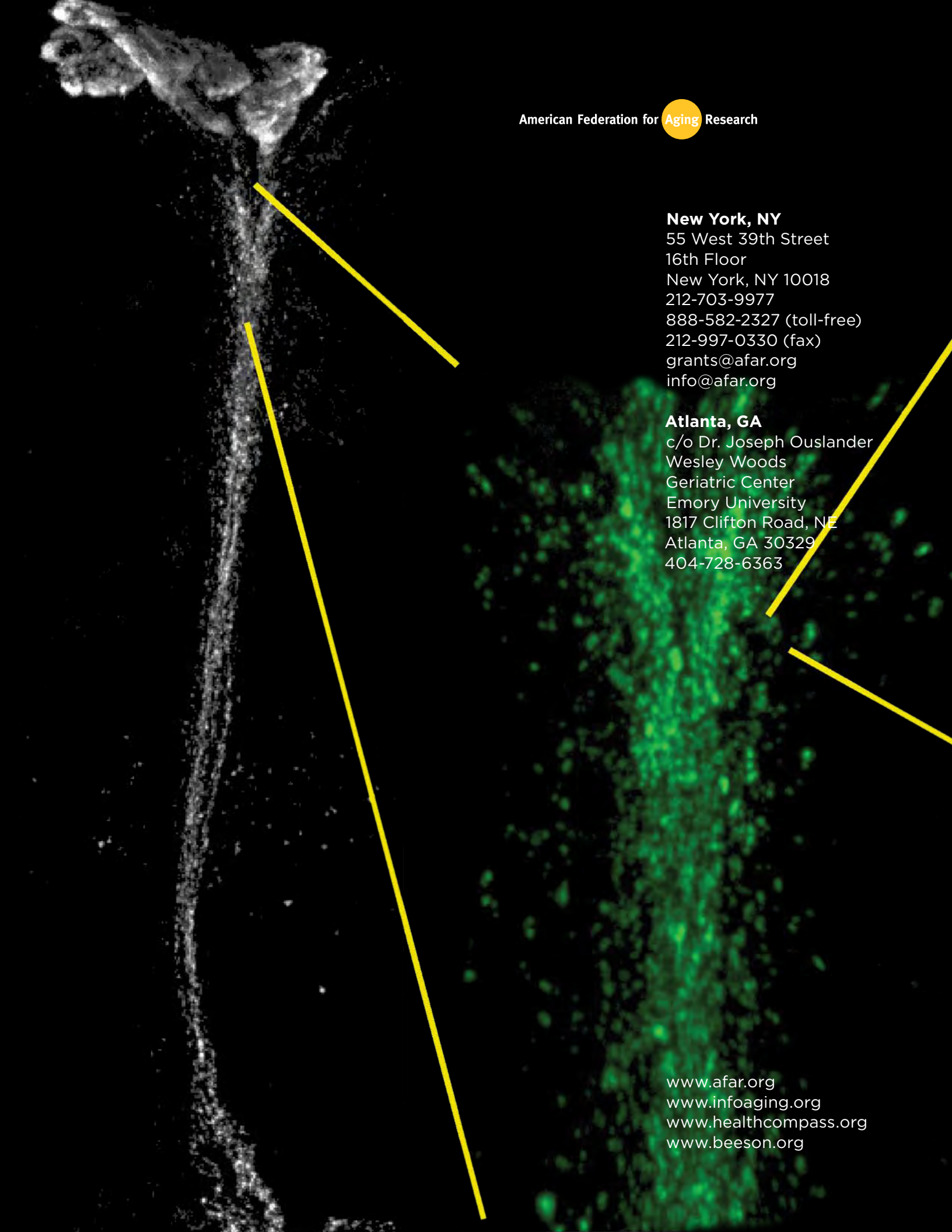
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