

FUNDING SOURCES for Strategic Initiative #2
Promoting well-being, Finding cures

Alfred P. Sloan Foundation <http://www.sloan.org/apply>

The Foundation is unique in its focus on science, technology, and economic institutions. It believes the scholars and practitioners who work in these fields are chief drivers of the nation's health and prosperity.

Alternatives Research and Development Foundation (ARDF) <http://www.ardf-online.org/>

The mission of the Alternatives Research and Development Foundation is to fund and promote the development, validation and adoption of non-animal methods in biomedical research, product testing and education.

Alzheimer's Association http://www.alz.org/professionals_and_researchers_research_programs.asp

The Alzheimer's Association International Research Grant Program funds investigations that advance our understanding of Alzheimer's disease, help identify new treatment strategies, provide information to improve care for people with dementia, and further our knowledge of brain health and disease prevention. Our awards support investigators at every professional stage and always include categories specifically designed to help talented young scientists establish careers in Alzheimer's research.

American Lung Association <http://www.lungusa.org/finding-cures/grant-opportunities/grant-offerings.html>

Today, the American Lung Association Research Program is comprised of 3 distinct programs – the Awards and Grants Program; the Asthma Clinical Research Centers Network (ACRC) and the Epidemiology and Statistics Program.

American Health Assistance Foundation (AHAF) <http://www.ahaf.org/research/>

Alzheimer's Disease Research
Macular Degeneration Research
National Glaucoma Research

American Association for Cancer Research (AACR)

<http://www.aacr.org/home/scientists/aacr-research-funding.aspx>

A hallmark of the AACR is the promotion and support of the highest quality cancer research.

[Funding Opportunities for Postdoctoral or Clinical Research Fellows](#)
[Funding Opportunities for Junior Faculty](#)
[Funding Opportunities for Independent Investigators](#)

American Asthma Foundation Research Program

<http://www.americanasthmafoundation.org/research-program/overview>

Over the past eleven years, the American Asthma Foundation has awarded nearly \$80 million to 145 outstanding researchers. These scientists have been drawn from a wide range of fields including biology, epidemiology, medicine, pathology, and pharmacology. American Asthma Foundation grants have generated nearly \$50 million in new funds from other sources for further asthma research.

American Society of Nephrology (ASN) http://asn-online.org/grants_and_funding/Scherbenske-Grant.aspx

The American Society of Nephrology (ASN) leads the fight against kidney disease by educating health professionals, sharing new knowledge, advancing research, and advocating the highest quality care for patients.

American Heart Association

http://my.americanheart.org/professional/Research/FundingOpportunities/Funding-Opportunities_UCM_316909_SubHomePage.jsp#

The American Heart/Stroke Association funds investigator-initiated career development and knowledge discovery projects through its research programs such as the [AHA Pharmaceutical Roundtable Program](#). We're also committed to identifying and supporting specific science areas deemed critical to achieving our mission and strategic objectives

American Foundation for Aging Research (AFAR) <http://www.afar.org/CART.html>

Identifying and funding a broad range of cutting-edge research most likely to increase knowledge about healthy aging.

Arthritis Foundation <http://www.arthritis.org/research-new-investigators.php>

The Arthritis Foundation Research Program seeks to maximize the impact of its research investment by focusing in three principal disease areas – Osteoarthritis, Rheumatoid Arthritis and Juvenile Arthritis. The Foundation supports high-quality, peer-reviewed research in these targeted areas in several ways.

Autism Speaks <http://www.autismspeaks.org/science/grants-program/open-grants-how-apply>

In 2011, Autism Speaks research funding will be restricted to projects that address one of the following priorities:

- Discovery and *characterization of risk factors for autism*, especially environmental risk factors and mechanisms for gene-environment interactions.
- Development of *methods for very early detection* of ASD risk.
- Understanding *factors that influence quality of life for adults with autism*, emphasizing effective supports, interventions, and treatments, functional outcomes, medical co-morbidities, and mortality.
- Identification of the *molecular pathophysiology of ASD that can inform translational research* for drug discovery or development of diagnostic methods.
- Development and evaluation of *novel treatments* that can address the core symptoms and associated medical conditions throughout the lifespan .
- *Dissemination* of empirically-validated screening, diagnostic and treatment approaches to community settings

Bayer, Inc <http://www.bayer-hemophilia-awards.com/en/essential-information/index.php>

Currently, the Program's Research Priorities are focused on hemophilia. The program's research priorities for the 2010/2011 cycle are as follows:

- Research into the impact of advancing age on hemophilia patients, including the effect of co-morbidities previously unseen in the hemophilia patient population.
- Projects evaluating how to prevent inhibitor development.
- Clinical studies focusing on treatment modalities for hemophilia.

- Research focused on understanding the therapeutic mechanism of action of FVIIa
- Innovations that would lead to improved safety, efficacy or duration of action of rFVIIa for the treatment of hemophilia
- Development of experimental in vitro and in vivo models to evaluate therapeutics for the treatment of bleeding disorders
- Discovery or development of new recombinant molecules with potential therapeutic value in bleeding disorders
- New delivery options for these molecules, including gene therapy
- Research to define a molecular basis for inhibitor development in hemophilia
- Health outcomes and quality-of-life research related to hemophilia
- Studies designed to increase the diagnosis, recognition and treatment of hemophilia

Bill & Melinda Gates Foundation

<http://www.gatesfoundation.org/grantseeker/Pages/foundation-grant-making-priorities.aspx>

To invest resources most responsibly, the foundation begins by asking:

- What affects the most people?
- What has been neglected?
- Where can we make the greatest change?
- How can we harness innovative solutions and technologies?
- How can we work in partnership with experts, governments, and businesses?

Next, we look for projects that:

- Produce measurable results
- Use preventive approaches
- Promise significant and long-lasting change
- Leverage support from other sources
- Accelerate work the foundation already supports

Burroughs Wellcome Fund www.bwfund.org

The Burroughs Wellcome Fund's grantmaking strategies are to support biomedical scientists at the beginning of their careers and to make grants in areas of science that are poised for significant advancement but currently undervalued and underfunded. Within this overall strategy, BWF makes grants within six focus areas:

[Biomedical Sciences](#)

[Infectious Disease](#)

[Interfaces in Science](#)

[Population and Laboratory Based Sciences](#)

[Reproductive Sciences](#)

[Science Education](#)

Cerebral Palsy International Research Foundation (CPIRF) <http://www.cpirf.org/research/grant-applications>

The Foundation provides funding for pilot studies on research important to the prevention and treatment of cerebral palsy, including improvement in the quality of life of persons with disabilities due to cerebral palsy and closely related developmental brain disorders. This broad research agenda includes basic, clinical and applied research in the biomedical and bioengineering sciences

Center for Disease Control and Prevention www.grants.gov

CHDI Foundation, Inc

http://www.highqfoundation.org/index.php?option=com_content&view=article&id=65&Itemid=2

CHDI is a private, not-for-profit research organization. We work with an international network of scientists to discover drugs that slow the progression of Huntington's disease (HD). CHDI supports investigator-initiated research through two mechanisms: the Early Discovery Initiative and Research Submissions. Applications are welcome from scientists working in academic and industrial laboratories.

Department of Defense Congressionally Directed Medical Research Programs

[Lung Cancer](#)

[Amyotrophic Lateral Sclerosis](#)

[Autism](#)

[Bone Marrow Failure](#)

[Breast Cancer](#)

[Defense Medical Research and Development Program](#)

[Gulf War Illness](#)

[Lung Cancer](#)

[Multiple Sclerosis](#)

[Neurofibromatosis](#)

[Ovarian Cancer](#)

[Peer Reviewed Cancer](#)

[Peer Reviewed Orthopaedic](#)

[Prostate Cancer](#)

[Psychological Health/Traumatic Brain Injury](#)

[Spinal Cord Injury](#)

Epilepsy Foundation <http://old.epilepsyfoundation.org/research/grants.cfm>

The Epilepsy Foundation supports a series of grants to advance the understanding of epilepsy that will lead to better treatment, more effective prevention, and ultimately to a cure. Our grants fund a wide range of researchers including students, junior level and senior level investigators

Fahs-Beck Fund for research and Experimentation http://www.fahsbeckfund.org/grant_programs.html

Grants of up to \$20,000 are available to help support the research of faculty members or post-doctoral researchers affiliated with non-profit human service organizations in the United States and Canada. Areas of interest to the Fund are: studies to develop, refine, evaluate, or disseminate innovative interventions designed to prevent or ameliorate major social, psychological, behavioral or public health problems affecting children, adults, couples, families, or communities, or studies that have the potential for adding significantly to knowledge about such problems.

Human Frontier Science Program <http://www.hfsp.org/funding/research-grants>

The strategic aims of HFSP are to:

- Support innovative, cutting edge research at the frontiers of the life sciences;
- Encourage high risk research;
- Promote international collaboration in the spirit of science without borders;
- Enable financial and intellectual independence for early career researchers;
- Raise the profile of HFSP and its work through an intelligent communication strategy;
- Foster inclusiveness by increasing participation by female scientists; and
- Sustain the means of achieving its distinctive mission in the face of the rising cost of research

Institute for Advancing Medical Innovation <http://www2.kumc.edu/iami/>

The Institute is designed to create an unprecedented collaboration of resources and processes to support the following key objectives:

1. Translate innovative research into medical innovations, and through proof-of-concept awards to translational researchers, advance these innovations through a series of commercially-focused go/no go decision points;
2. Advance novel new drugs, drug products, and drug delivery platform technologies to patients through effective partnerships with other academic institutions (including other CTSA's), industry, government and disease philanthropy organizations;
3. Develop drug discovery, drug delivery, and bioengineering innovators who have the skill sets, sense of urgency and access to resources necessary to drive medical innovation discoveries from the university to the clinic through an Innovation Fellow Training Program;
4. Operate an Office of Project and Portfolio Management that will identify projects, create project teams and timelines, and work with the KU Center for Technology Commercialization to create and enhance value proposition.

John Templeton Foundation <http://www.templeton.org/what-we-fund/funding-priorities>

The John Templeton Foundation serves as a philanthropic catalyst for discoveries relating to the Big Questions of human purpose and ultimate reality. We support research on subjects ranging from complexity, evolution, and infinity to creativity, forgiveness, love, and free will

J.R. and Inez Jay Fund –HBC <http://www.hbc.ku.edu/internalservices/programs/jayfund/jayfund.html>

Purpose of the fund is to stimulate interdisciplinary, biomedical research activities that lead to large-scale research activities such as multi-investigator R01 awards, program projects, and center grants administered through the Higuchi Biosciences Center for Biomedical Research.

Juvenile Diabetes Research Foundation http://www.jdrf.org/index.cfm?page_id=114027

As the leading charitable funder of diabetes research worldwide, JDRF offers a wide variety of grants and fellowships to qualified researchers. JDRF is committed to spending approximately \$125 million in FY2012 to support research relevant to our mission of finding a cure for diabetes and its complications

Kansas City Area Life Sciences Institute <http://www.kclifesciences.org/programs/research-grant-program/>

KCALSI's approach for achieving this goal is to support research development grants capable of generating

critical preliminary data needed to develop competitive proposals for submission to external agencies. Awards are limited to \$25,000 – \$50,000 for one year and are intended to exploit investigator and facility strengths leading to highly competitive proposals directed toward future external funding.

Kansas Health Foundation <http://www.kansashealth.org/grantmaking>

The Kansas Health Foundation is driven by a mission to improve the health of all Kansans. To accomplish its mission, the Kansas Health Foundation's Board of Directors approved the following focus areas:

- Promoting the healthy behaviors of Kansans
- Strengthening the public health system
- Improving access to health care for Kansas children
- Providing health data and information to policymakers
- Building civic leadership
- Growing community philanthropy

Keck Foundation, W.M. <http://www.wmkeck.org/grant-programs/science-engineering.html>

The Keck foundation goal's is to generate far-reaching benefits for humanity. Following the ideals of our founder, the Foundation supports outstanding science, engineering and medical research.

Klingenstein Fellowship Awards in the Neurosciences <http://www.klingfund.org/finances.php>

The purpose of these awards is to support, in the early stages of their careers, young investigators engaged in basic or clinical research that may lead to a better understanding of neurological and psychiatric disorders.

The Klingenstein Fund recognizes that to accomplish this goal it is necessary to encourage a variety of new approaches. Several areas within the neurosciences are of particular interest to the Fund:

Cellular and molecular neuroscience—Studies of the mechanisms of neuronal excitability and development, and of the genetic basis of behavior.

Neural systems—Studies of the integrative function of the nervous system.

Clinical research—Studies designed to improve the prevention, diagnosis, treatment and our understanding of the causes of neurological and psychiatric disorders.

Leukemia and Lymphoma Society <http://www.lls.org/#/researchershealthcareprofessionals/academicgrants/>

The Leukemia & Lymphoma Society's (LLS's) academic grants support and encourage basic and translational leukemia, lymphoma and myeloma research.

LLS awards research grants through a number of traditional academic programs:

- [Career Development Program](#)
- [Translational Research Program](#)
- [Specialized Center of Research \(SCOR\) Program](#)
- [Quality of Life Research Initiative](#)
- [Other grants](#)

Melanoma Research Foundation (MRF) <http://www.melanoma.org/research/grant-announcements>

Our mission is to fund RESEARCH to find more effective treatments and a cure for melanoma, to EDUCATE clinicians, related healthcare providers, patients and families about melanoma prevention and treatments, and to ADVOCATE on behalf of the melanoma patient and scientific community.

Career Development Awards
Established Investigator Awards

Midwest Diabetes Coalition <http://diabetes.kumc.edu/Pilot%20Grants.html>

The KU Diabetes Institute administers a Pilot Grants in Diabetes Program (PGD) through its lead role in the Midwest Diabetes Institute. The purpose of the PGD program is to fund research in diabetes to ensure that promising ideas for curing and managing the disease are supported.

NATIONAL SCIENCE FOUNDATION

<http://www.nsf.gov/funding/>

Office of Integrative Activities <http://www.nsf.gov/dir/index.jsp?org=OIA>

NATIONAL INSTITUTES OF HEALTH

National Cancer Institute <http://www.cancer.gov/>

National Eye Institute <http://www.nei.nih.gov/>

National Heart, Lung, and Blood Institute (NIH) <http://www.nhlbi.nih.gov/>

National Human Genome Research Institute (NIH) <http://www.genome.gov/>

National Institute on Aging (NIH) <http://www.nia.nih.gov/>

National Institute on Alcohol Abuse and Alcoholism (NIH) <http://www.niaaa.nih.gov/Pages/default.aspx>

National Institute of Allergy and Infectious Diseases (NIH) <http://www.niaid.nih.gov/Pages/default.aspx>

National Institute of Arthritis and Musculoskeletal and Skin Diseases <http://www.niams.nih.gov/>

***Eunice Kennedy Shriver* National Institute of Child Health and Human Development** <http://www.nichd.nih.gov/>

National Institute on Deafness and Other Communication Disorders <http://www.nidcd.nih.gov/>

National Institute of Dental and Craniofacial Research <http://www.nidcr.nih.gov/>

National Institute of Diabetes and Digestive and Kidney Diseases <http://www2.niddk.nih.gov/>

National Institute on Drug Abuse <http://www.nida.nih.gov/nidahome.html>

National Institute of Environmental Health Sciences <http://www.niehs.nih.gov/>

National Institute of Mental Health <http://www.nimh.nih.gov/index.shtml>

National Institute on Minority Health and Health Disparities <http://www.nimhd.nih.gov/>

National Institute of Neurological Disorders and Stroke <http://www.ninds.nih.gov/>

National Institute of Nursing Research <http://www.ninr.nih.gov/>

National Library of Medicine <http://www.nlm.nih.gov/>

Ovarian Cancer Research Fund

OCRF is the largest independent organization in the United States dedicated exclusively to funding ovarian cancer research-- and to finding a cure.

http://www.ocrf.org/index.php?option=com_content&view=category&layout=blog&id=39&Itemid=244

Parkinson's Disease Foundation

The Parkinson's Disease Foundation (PDF) has a four-pronged research program dedicated to finding the cause(s) of and a cure for Parkinson's disease. In the fiscal year 2012, which began July 1, 2011, PDF is providing support to 40 scientific projects for a total of \$5.5 million.

PDF's research program includes:

- [Center Grants Program](#)

- [International Research Grants Program](#)
- [Fellowship and Career Development Program](#)
- Collaborative Endeavors (including the [Advancing Parkinson's Treatments Innovations Grant](#))

http://www.pdf.org/en/grant_funding

Pew Charitable Trusts http://www.pewtrusts.org/our_work_detail.aspx?id=648

The Pew Scholars Program in the Biomedical Sciences provides funding to young investigators of outstanding promise in science relevant to the advancement of human health. [The program](#) makes grants to selected academic institutions to support the independent research of outstanding individuals who are in their first few years of their appointment at the assistant professor level.

Peter F. McManus Charitable Trust Grants

<http://www.drugfree.org/join-together/funding/peter-f-mcmanus-charitable>

The Peter F. McManus Charitable Trust will make grants of up to \$50,000 for research into the causes of alcohol and other drug addiction.

A total of \$150,000 to \$200,000 in grants will be awarded this year to support basic, clinical, and social-environmental research. Only nonprofits may apply, and no more than 10 percent of the grant amount may be used for indirect costs.

PhRMA Foundation <http://www.phrmafoundation.org/>

For more than 45 years the PhRMA Foundation has supported the training, research, and careers of young pharmaceutical scientists by awarding competitive grants and fellowships. Our programs have helped facilitate the careers of thousands of scientific investigators, faculty members, and physicians.

Prevent Cancer Foundation <http://preventcancer.org/what-we-do/research/grants-fellowships/>

The Prevent Cancer Foundation (formerly the Cancer Research and Prevention Foundation) is a national, nonprofit organization whose mission is cancer prevention and early detection through research, education and community outreach to all populations, including children and the underserved.

Robert Wood Johnson foundation <http://www.rwjf.org/grants/>

Through our investments in our grantees, we seek to improve the health and health care of all Americans.

Upcoming calls for proposals:

- Robert Wood Johnson Foundation Health Policy Fellows
- Robert Wood Johnson Foundation Executive Nurse Fellows
- Robert Wood Johnson Foundation Clinical Scholars Program
- Robert Wood Johnson Foundation Community Health Leaders
- Evaluating Innovations in Nursing Education

Sarcoma Foundation of America http://www.curesarcoma.org/index.php/research_grants/

The SFA raises funds to support basic research focused on discovering and developing new and effective therapies to treat and eradicate Sarcoma. In addition to SFA sponsored grants, the organization has recently partnered with the American Society for Clinical Oncology (ASCO) and the Capon Family to award a \$450,000 research grant to a Sarcoma researcher.

Simons Foundation <https://simonsfoundation.org/grants>

The application of quantitative methods to biology has been progressively more productive over the past several decades. The use of statistical methods and largescale data analyses, for example, is in the process of revolutionizing modern genetics. The applications of both math and physics have been critical to neurobiology. Bringing together mathematicians and biologists, the Simons Foundation supports a Biology Colloquium at the Mathematical Sciences Research Institute (MSRI), a systems biology program at the Institute for Advanced Study (IAS), and a newly established biology program at the Institut des Hautes Études Scientifiques (IHÉS). Through these interdisciplinary programs, the foundation hopes to stimulate collaborations that will further advance research in the life sciences.

Scoliosis Research Society <http://www.srs.org/research/>

The Research Grant Committee feels the following topics are important areas for research. This list is not all-inclusive and should not deter other areas of spinal pathology research.

1. Evidence Based Medicine
2. Idiopathic scoliosis
3. Etiology
4. Non-op and operative treatment
5. 3D deformity of the spine and thorax
6. Adult deformity
7. Treatment and outcomes
8. Osteoporosis
 - a. Osteoporotic spine fractures
 - b. how it impacts scoliosis kyphosis management
 - c. how it relates to spinal deformity and instrumentation
9. Early onset scoliosis treatment
10. Sagittal imbalance
11. Congenital scoliosis
12. Neuromuscular spinal deformity
13. Deformity and reconstruction arising from spine and sacral tumor treatment
14. Thoracic insufficiency children associated with spinal deformity
15. Pulmonary outcome sequelae following common natural history of spine deformity and treatment history.

Sunflower Foundation http://www.sunflowerfoundation.org/areas_of_interest-capacity_building.php

Our vision is to direct resources toward helping people and communities achieve and maintain optimal health by improving access to health care and information, eliminating barriers, emphasizing prevention and promoting healthy environments that enable and support personal responsibility for health.

The Anthony Marchionne Foundation – Small Grants Program

http://public.wsu.edu/~socpsych/anthony_marchionne_foundation.htm

Since 2003 the Anthony Marchionne Foundation has supported research on issues of well-being. The Foundation currently emphasizes two specific research areas:

- 1.) **Aspects of life-singlehood.** The Foundation continues to support researchers who pursue original work on the dynamics of the never-married. We provide support to investigators in a variety of disciplines.
- 2.) **Health, medicine, and behavior.** The Foundation is interested in supporting small-scale studies on the interface between health, medicine, and behavior. The intent is to fund pilot work that the investigator can use as the basis of a large-scale, major grant application.

The Center for Health Design

<http://www.healthdesign.org/chd/research-reports-projects/request-research-proposals>

CHD's mission is to transform healthcare environments for a healthier, safer world through design research, education, and advocacy. Since 2008, our Research Coalition has been supporting cutting-edge research in the field of evidence-based design for healthcare through requests for proposals.

Thrasher Research Fund <http://www.thrasherresearch.org/>

Ideal Thrasher Awards address significant health problems that affect children in large numbers and offer the potential for practical solutions to these problems. Such solutions should be innovative and have the potential for rapid and broad applicability with low financial and/or technical barriers to implementation. Hypothesis-driven research is given priority over exploratory, hypothesis-generating research.

The Charles A. and Anne Morrow Lindbergh Foundation

<http://www.lindberghfoundation.org/docs/index.php/our-grants/funded-grant-projects>

Lindbergh grants are made in the following categories:

- Agriculture
- Aviation/ Aerospace
- Conservation of Natural Resources - Including Animals, Plants, Water, and General Conservation (Land, Air, Energy, Etc.)
- Education - Including Humanities/ Education, The Arts, and Intercultural Communication
- Exploration
- Health - Including Biomedical Research, Health and Population Sciences, and Adaptive Technology
- Waste Minimization and Management
- A Jonathan Lindbergh Brown Grant may be given to a project to support adaptive technology or biomedical research which seeks to redress imbalance between an individual and his or her human environment.

The Commonwealth Fund <http://www.commonwealthfund.org/Grants-and-Programs.aspx>

The Fund supports independent research on health and social issues and makes grants to improve health care practice and policy. We are dedicated to helping people become more informed about their health care and improving care for vulnerable populations such as children, the elderly, low-income families, minorities, and the uninsured.

Programs:

[Delivery System Innovation and Improvement](#)

[Health Reform Policy](#)

[Health System Performance Assessment and Tracking](#)

[International Program in Health Policy and Innovation](#)

Fellowship in Minority Health Policy

The Rockefeller Foundation <http://www.rockefellerfoundation.org/grants/what-we-fund>

The focus of the Rockefeller Foundation resources and energies are on five interconnected issue areas:

Basic Survival Safeguards - Secure food, water, housing and infrastructure

Climate & Environment - Sustainable growth and resilience to climate change

Urbanization - Solutions for fast-growing cities

Social & Economic Security - Stronger safety nets, reinvigorated citizenship, re-imagined policy frameworks

United States - Israel Binational Science Foundation (BSF)

<http://www.bsf.org.il/BSFPublic/DefaultPage1.aspx?PageId=223&innerTextID=223>

Regular research grants

Open to all scientists from Israel and the USA. Please verify your [eligibility](#) before submitting.

Start-up research grants

Open to American and Israeli scientists who are in the initial stages of their independent careers. Find more details [here](#).

Workshop grants

Open to all American and Israeli scientists, and addressing specific topics that will change from one year to the next and will be announced in the annual Call for Proposals. You can see the current call [here](#).

Prof. Rahamimoff Travel grants

Open to American and Israeli PhD students and post-doctoral researchers for research related trips to the other country. Find more details [here](#).

BSF Energy Research grants

Supported by funds from the Israeli Ministry of National Infrastructures, and the U.S. Department of Energy. It will support joint research programs in alternative and renewable energy, and in energy efficiency. You can read more about the program [here](#). **Please note that the submission to this program is irregular and is dependant on the availability of funds.

Transformative Science Research grants

A new program in 'Transformative Science' was launched in 2010. This is a small program of up to 2 awards annually that will receive larger grants than in our regular program. To be awarded a grant, the program must be 'transformative'. The BSF has adopted the NSF definition for 'Transformative Science', which is: **Research driven by ideas that have the potential to radically change our understanding of an important scientific concept, or lead to the creation of a new paradigm, or a new field of science. Such research is characterized by its challenge to current understanding or by its pathways to new frontiers.**