Organizations Propose Revisions to New Open Access Proposal

On October 17, fifty-seven scientific and medical organizations submitted a letter proposing revisions to the National Institutes of Health (NIH) open access policy that was sent to Dr. Elias Zerhouni. The letter asks that NIH provide public access to final articles through the existing system of NIH links from the abstracts that are indexed in the *MEDLINE*/*PubMed* database rather than hosting author manuscripts on the *PubMed Central* (*PMC*) Web site.

By linking to journal Web sites rather than hosting different manuscripts, NIH can provide access to more than a million articles that are available without cost to the government or to the reader. In detail, the proposal includes a public-private partnership with NIH that would take advantage of the fact that most not-for-profit publishers already make all of their research articles—not just NIH-supported ones—available for free to the public 12 months or less after publication. Instead of NIH/*PMC* undertaking a new publishing venture that involves formatting and publishing unfinished manuscripts of NIH-funded authors, the letter argues that NIH should use existing links from NIH's highly respected *PubMed* to the existing journals' Web sites. Using these links, readers can access the final, published articles already residing on journals' Web sites.

Since the May 2 launch of its enhanced access policy, NIH has reported that only about 3% of the eligible articles have been voluntarily submitted to NIH to be placed in the *PMC* database for public review. This latest proposal is an attempt to make the open access policy a success for both NIH and the publishing community. The letter asks that NIH meet with the signatories in order to create steps to implement this new proposal.

Office for Human Research Protections Requests Public Comment

The Office for Human Research Protections (OHRP) is soliciting public comment on a draft guidance document for Institutional Review Boards (IRBs), investigators, research institutions, Department of Health and Human Services (HHS) agencies that conduct or sponsor human subjects research, and other interested parties, entitled "Guidance on Reporting and Reviewing Adverse Events and Unanticipated Problems Involving Risks to Subjects or Others."

For many years, IRBs and research communities have requested that federal regulatory agencies provide harmonized guidelines and requirements for reporting adverse events in the context of research involving human subjects. Most recently, the Secretary's Advisory Committee on Human Research Protections (SACHRP) at its March 2004 meeting approved a resolution recommending to HHS that OHRP and the US Food and Drug Administration (FDA) promptly issue clear and consistent joint guidance on IRB review of both internal and external adverse event reports that will best serve to protect human subjects and effectively reduce regulatory burden.

As an initial step in responding to the SACHRP recommendation, OHRP has developed draft guidance regarding the reporting and handling of adverse events and unanticipated problems involving risks to subjects and others. In preparing this draft guidance, OHRP received comments from members of the Federal Adverse Events Task Force (FAETF), which includes representatives from the National Institutes of Health, the Agency for Healthcare Research and Quality, the Centers for Disease Control and Prevention, the FDA, OHRP, the Department of Defense, and the Department of Veterans Affairs.

OHRP expects that its guidance on this topic will be the first of many initiatives in a cooperative effort by the major federal agencies that regulate, conduct, or sponsor human subjects research to develop a comprehensive and harmonized approach to the reporting and handling of adverse events and unanticipated problems. The ultimate goal of these efforts is to ensure that the reporting and analysis of adverse events and unanticipated problems occur in a timely, meaningful way so that human subjects can be protected from avoidable harms. OHRP anticipates that its guidance may evolve in conjunction with future initiatives of FAETF and its member agencies. In particular, OHRP will continue to work with FDA to ensure that FDA and OHRP guidance regarding the reporting and handling of adverse events and unanticipated problems are harmonized to the maximum extent possible.

Fogarty International Center Funds 16 Framework Programs

The Fogarty International Center (FIC), in partnership with the National Institute on Deafness and Other Communication Disorders and the National Institute of Dental and Craniofacial Research, all part of the National Institutes of Health (NIH), has announced 16 awards for its new funding initiative, "Framework Programs in Global Health."

The awards support the development of innovative, multidisciplinary global health programs on campuses in the United States and in low- and middle-income nations. The program is designed to build global health research capacity in the United States and abroad. Institutions will create administrative frameworks to tie multiple schools together on the topic of global health and to develop multidisciplinary global health curricula for undergraduates, graduates, and professional school students. Schools of business, law, journalism, engineering, social science, and others have teamed up with schools of public health and medicine under the program. Each program will build on currently funded global health projects at the institution supported by NIH and other sponsors and encourage new training opportunities, collaborations, and research.

Some universities formed partnerships with other institutions, both in the United States and overseas, to submit joint applications. For instance, the University of Alabama at Birmingham (UAB) will partner with Gallaudet University to focus on issues of deafness and disabilities in the developing world and with the Southern Institute of Appropriate Technology in Lineville, Alabama, and the University of Alabama at Tuscaloosa Environmental Institute to develop courses to address mitigation of environmental and health impacts of development projects. Nine UAB schools and international collaborating institutions in four countries will also participate in the program.

Massachusetts General Hospital, through the Harvard Program in Refugee Trauma, will partner with the University of Rome, La Sapienza, and the Istituto Superiore di Sanita (the Italian National Institute of Health) to develop a master's degree program for policy makers, scientists, and clinicians caring for traumatized populations affected by human conflicts and natural disasters. They will work with 35 ministries of health from conflict- and disaster-affected countries in the design and implementation of the program.

The Universidad Peruana Cayetano Heredia (UPCH) in Lima, Peru, will enhance its framework program through well-established collaborative relationships with a network of partners in Peru, the United States, and England. The schools of Medicine, Sciences and Philosophy, Veterinary Medicine and Zoology, Education, and Public Health will work together to establish a global health framework at UPCH.

In addition to the development of curricula and new interdisciplinary degree programs, the awards will support a range of activities, including travel support for short-term experiences overseas, interdisciplinary symposia and workshops, the creation of international virtual learning communities, and faculty exchanges with international partners to encourage collaborative teaching and research.

Sixteen institutions received awards: Baylor College of Medicine, Johns Hopkins Bloomberg School of Public Health, Massachusetts General Hospital, Tufts University, UPCH, UAB, University of California, Los Angeles, University of Maryland at Baltimore, University of Michigan, University of North Carolina, Chapel Hill, University of Virginia, Charlottesville, and the University of Washington. In addition, four institutions received the planning grants for institutions in low- and middle-income countries to develop full framework applications: the Federal University of Rio de Janeiro, Brazil; Fudan University School of Public Health in China; Muhimbili University College of Health Sciences in Tanzania; and the University of Zimbabwe.

FIC reissued this solicitation with minor changes on November 10, 2005 (PAR-06-067). A more complete description of each of these programs is at <http://www.fic.nih.gov/programs/framework.html>.

NIH Awards a National Stem Cell Bank and New Centers of Excellence in Translational Human Stem Cell Research

The National Institutes of Health (NIH) has awarded $16.1 million over 4 years to fund a national stem cell bank and $9.6 million to fund two new Centers of Excellence in translational human stem cell research for 4 years.

The National Stem Cell Bank was awarded to the WiCell Research Institute in Wisconsin and will consolidate many of the federally funded eligible human embryonic stem cell lines in one location, reduce the costs that researchers have to pay for the cells, and maintain quality control over the cells. The two Centers of Excellence, awarded to the University of California, Davis and Northwestern University, will bring together stem cell experts, disease experts, and other scientists to explore ways in which human stem cells may be used in the future to treat a wide range of diseases, such as blood cancers and blood disorders, kidney disease, and neurologic disorders.

The purpose of the National Stem Cell Bank is to enable researchers to fully analyze, characterize, and control the quality of approved cell lines to optimize and standardize the techniques used for comparing the properties of stem cells. This is a critical step for both basic and translational research toward the eventual development of potential therapies.

The stem cell bank will provide scientists with affordable and timely access to federally approved human embryonic stem cells and other technical support, which will make it easier for scientists to obtain the cell lines currently listed on the NIH Human Embryonic Stem Cell Registry at <http://stemcells.nih.gov/research/registry/>. The stem cell expert team at the WiCell Research Institute, led by Derek Hei and James Thomson, will also ensure consistent quality of the lines by analyzing and comparing existing cell lines, documenting the growth characteristics of cell lines, assessing the cells' genetic stability, and determining the molecular background and basic characteristics of the different cell lines.

Researchers at the two stem cell Centers of Excellence will develop new technologies to advance the ability to use stem cells to approach a particular

disease. The centers are designed to encourage formation of new groups of investigators and collaboration with clinicians to conduct stem cell research for disease-specific applications and increase the pool of professional scientists with disease-specific expertise who work in stem cell biology.

At Northwestern University, John A. Kessler, MD, will receive as principal investigator $3.6 million over 4 years to study factors that influence the differentiation of human embryonic stem cells and to look at combining unique biomaterials and human embryonic stem cells as a possible means to repair the damaged spinal cord.

At the University of California, Davis, Alice F. Tarantal, PhD, will receive as principal investigator $6 million over 4 years to conduct multidisciplinary stem and progenitor cell research in preclinical primate models. The Center will study stem and progenitor cell coculture methods for increasing the number of umbilical cord blood stem cells available for cell transplants, methods to isolate and expand renal progenitor cells as a potential cell therapy for urinary tract obstruction in children with kidney disease, and improved cell imaging methods that could be used for tracking small numbers of transplanted stem cells in clinical studies.

Additional information is available at <http://www.nih.gov/icd/od/>.

NIH Funds Nine Science Education Partnership Awards

Students across the country are being encouraged to immerse themselves in science as part of a National Institutes of Health (NIH) program to increase science literacy and encourage research careers. The NIH announced that it will award $9.4 million to fund nine Science Education Partnership Awards (SEPAs). Administered by the National Center for Research Resources (NCRR), a component of the NIH, SEPA grants provide from 2 to 5 years of support.

Recipients of the SEPAs are Exploratorium in San Francisco, California; Great Lakes Science Center in Cleveland, Ohio; Harvard University Medical School in Cambridge, Massachusetts; Jackson State University in Jackson, Mississippi; Oregon Health and Science University in Portland, Oregon; University of Medicine and Dentistry of New Jersey in Newark; University of Texas-Pan American in Edinburg; University of Wisconsin-Milwaukee; and Yale University in New Haven, Connecticut.

SEPA programs serve kindergarten to grade 12 students and teachers, as well as science centers and museums across the country. Many of the programs target underserved and/or minority populations that are less likely to pursue science careers. In addition, SEPA partnerships develop projects that educate the general public about health and disease, with the aim of helping people make better lifestyle choices as new medical advances emerge.

In the initial 3-year phase, SEPA programs form partnerships among biomedical and clinical researchers, educators, community groups, and other interested organizations to create programs that provide a better understanding of scientific research. In the second 2-year phase of the program, these SEPA-generated curricula are more broadly disseminated.

For more information about SEPA, visit <http://www.ncrrsepa.org>.

National Cancer Institute Announces $35 Million in Awards to Nanotechnology Partnerships

The National Cancer Institute (NCI), component of the National Institutes of Health (NIH), has announced funding for a major component of its $144.3 million, 5-year initiative for nanotechnology in cancer research. Awards totaling $35 million over 5 years, with $7 million total in the first year, will establish 12 Cancer Nanotechnology Platform Partnerships. The goal is to confront cancer at its molecular level using nanodevices, which will enable researchers to probe genetic defects inside cells, detect the earliest aberrations of cellular function that lead to cancer, and correct those errant processes long before they give rise to cancers large enough to be diagnosed by today's methods.

Nanotechnology has already demonstrated promising results in cancer research and treatment. In September 2004, the NCI launched the NCI Alliance for Nanotechnology in Cancer as a comprehensive, integrated initiative to develop and translate cancer-related nanotechnology research into clinical practice.

The NCI Alliance for Nanotechnology in Cancer encompasses four major program components, including the Cancer Nanotechnology Platform Partnerships. These partnerships, modeled after the NIH Bioengineering Research Partnerships, are designed to develop technologies for new products in six key program areas: molecular imaging and early detection, in vivo imaging, reporters of efficacy, multifunctional therapeutics, prevention and control, and research enablers.

The awards reflect a cross-section of technologies, disciplines, cancer types, geographies, and risk/reward profiles and will link universities to NCI-designated cancer centers. The awards include the following:

- Nanotherapeutic Strategy for Multidrug-Resistant Tumors, Northeastern University, Boston, Massachusetts; principal investigator: Mansoor Amiji, PhD
- DNA-Linked Dendrimer Nanoparticle Systems for Cancer Diagnosis and Treatment, University

of Michigan, Ann Arbor, Michigan; principal investigator: James Baker Jr, MD
- Metallofullerene Nanoplatform for Imaging and Treating Infiltrative Tumor, Virginia Commonwealth University, Richmond; principal investigator: Panos Fatouros, PhD
- Detecting Cancer Early with Targeted Nano-Probes for Vascular Signatures, University of California, San Francisco; principal investigator: Douglas Hanahan, PhD
- Photodestruction of Ovarian Cancer: ErbB3 Targeted Aptamer-Nanoparticle Conjugate, Massachusetts General Hospital, Boston; principal investigator: Tayyaba Hasan, PhD
- Hybrid Nanoparticles in Imaging and Therapy of Prostate Cancer, University of Missouri, Columbia; principal investigator: Kattesh Katti, PhD
- Near-Infrared Fluorescence Nanoparticles for Targeted Optical Imaging, The University of Texas M.D. Anderson Cancer Center, Houston; principal investigator: Chun Li, PhD
- Integrated System for Cancer Biomarker Detection, Massachusetts Institute of Technology, Cambridge; principal investigator: Scott Manalis, PhD
- Novel Cancer Nanotechnology Platforms for Photodynamic Therapy and Imaging, Roswell Park Cancer Institute, Buffalo, New York; principal investigator: Allan Oseroff, MD, PhD
- Multifunctional Nanoparticles in Diagnosis and Therapy of Pancreatic Cancer, State University of New York, Buffalo; principal investigator: Paras Prasad, PhD
- Nanotechnology Platform for Targeting Solid Tumors, The Sidney Kimmel Cancer Center, San Diego, California; principal investigator: Jan Schnitzer, MD
- Nanotechnology Platform for Pediatric Brain Cancer Imaging and Therapy, University of Washington, Seattle; principal investigator: Raymond Sze, MD

The other three components of the NCI Alliance for Nanotechnology in Cancer, all of which are now funded and operational, include

- Centers of Cancer Nanotechnology Excellence, which are multi-institutional hubs that will integrate nanotechnology across the cancer research continuum and provide new solutions for the diagnosis and treatment of cancer. Seven centers were funded in October 2005, with first-year funding totaling $26.3 million (<http://www.cancer.gov/newscenter/pressreleases/CentersofCancerNanotechExcellence>).
- The Nanotechnology Characterization Laboratory (NCL), which was established at NCI's Frederick, Maryland, facility in 2004. This laboratory performs analytic tests to guide the research community, supports regulatory decisions, and helps identify and monitor the environmental, health, and safety ramifications of nanotechnology applications. The NCL recently completed its first year of operation and is actively characterizing nanoparticles for academic and commercial researchers through a rigorous set of analytic protocols. The NCL works with the National Institute of Standards and Technology and the US Food and Drug Administration.
- Multidisciplinary research training and team development. The application of nanotechnology to cancer requires cross-disciplinary training in biologic and physical sciences. The Alliance will support training and career development initiatives to establish integrated teams of cancer researchers through mechanisms such as the NIH National Research Service Awards for Senior Fellows and NIH National Research Service Awards for Postdoctoral Fellows. Applications are now being accepted for training awards (<http://grants.nih.gov/grants/guide/rfa-files/RFA-CA-06–010.html>).

In addition, through NCI's collaboration with the National Science Foundation, a total of $12.8 million in grants were awarded in September 2005 to four institutions for research over the next 5 years. These grants allow US science and engineering doctoral students to focus on interdisciplinary nanoscience and technology research with applications to cancer (<http://www.cancer.gov/newscenter/pressreleases/NCINSFIGERT>).

For more information on the NCI Alliance for Nanotechnology in Cancer, please visit <http://nano.cancer.gov>.

NCCAM Expands Research Centers Program

The National Center for Complementary and Alternative Medicine (NCCAM) announced in October the funding of three centers of excellence and two international centers for the study of complementary and alternative medicine (CAM). With these new awards, NCCAM, a component of the National Institutes of Health (NIH), continues to enhance CAM research capacity by funding centers at leading US institutions and by establishing new global partnerships.

Three of the five new centers will explore therapies used in traditional Chinese medicine (TCM), including acupuncture and Chinese herbal mixtures. The other two centers will study a type of energy medicine (millimeter wave therapy) and botanical therapies used by traditional healers in Africa.

The three new Centers of Excellence provide 5 years of support for experienced researchers at some of the nation's leading universities. These researchers apply cutting-edge technologies to identify the potential benefits and underlying mechanisms of CAM practices.

The Center for Arthritis and Traditional Chinese Medicine at the Univer-

sity of Maryland in Baltimore will study the TCM approaches of acupuncture and herbs for the treatment of arthritis. Researchers will access the effects of acupuncture on inflammatory pain in an animal model and will conduct a clinical trial of an 11-herb Chinese formula (referred to as HLXL) for osteoarthritis of the knee, assess acupuncture's effect on inflammatory pain in an animal model, and study the efficacy of HLXL in an animal model of autoimmune arthritis.

The Center for Chinese Herbal Therapy at the Mount Sinai School of Medicine in New York will investigate a three-herb Chinese formula as a therapy for allergic asthma. Studies of the herbal formula will look at the mechanism of action in an animal model, characterize the herbs' active components, and investigate the formula's use in asthma patients.

The Center for Mechanisms Underlying Millimeter Wave Therapy at Temple University School of Medicine in Philadelphia will study the mechanisms of action of millimeter wave therapy (use of low-intensity millimeter wavelength electromagnetic waves) for a variety of diseases and conditions, as well as look at the therapy's use in animal models of chronic neuropathic pain and pruritis.

The International Centers for Research on CAM are the outgrowth of planning grants awarded by NCCAM to 11 international teams in 2003. These teams had 2 years to develop a research collaboration and infrastructure that could compete for 4-year grants. The recipients of these international centers grants will now carry out research on CAM and traditional medicine practices in countries where the practices are indigenous. These partnerships between researchers in US and foreign institutions will address whether the traditional practices can aid in health care locally and globally and build CAM research capacity internationally. Cofunders for these centers include NIH's Office of Dietary Supplements, the Office of AIDS Research, and Fogarty International Center. In addition, the National Cancer Institute will fund a third international center.

The first such center is the Functional Bowel Disorders in Chinese Medicine. The University of Maryland, the Chinese University of Hong Kong, the University of Illinois, Chicago, and the University of Western Sydney, Australia, will conduct multidisciplinary research on the TCM practices using acupuncture and herbs for the treatment of irritable bowel syndrome (IBS). Researchers will study the effects of acupuncture and a TCM herbal preparation in an animal model of IBS and conduct a preliminary study of the herbal preparation with IBS patients.

The International Center for Indigenous Phytotherapy Studies: HIV/AIDS, Secondary Infections and Immune Modulation involves the University of Missouri in Columbia, along with several institutions in the Republic of South Africa: the University of the Western Cape, the University of KwaZulu-Natal, the University of Cape Town, and the South African Medical Research Council. This center will study the safety and efficacy of traditional African plant-based therapies already in widespread use for human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and some of its secondary infections. Researchers will conduct a small clinical trial using sutherlandia (*Lessertia frutescens*) in adults with HIV and conduct preclinical and clinical research with African wormwood (*Artemisia afra*), which is used by traditional healers for treatment of many conditions seen in people with HIV/AIDS.

The National Cancer Institute will fund the International Center of Traditional Chinese Medicine for Cancer at The University of Texas M.D. Anderson Cancer Center in Houston, partnered with the Fudan University Cancer Hospital in Shanghai, China. This center will conduct preclinical and clinical studies of TCM approaches—herbs, acupuncture, and qi gong—for treating cancer and its symptoms, as well as treatment-related side effects.

The NCCAM's mission is to explore CAM medical practices in the context of rigorous science, train CAM researchers, and disseminate authoritative information to the public and professionals.

NCI Announces New Initiative on Energetics and Cancer

The National Cancer Institute (NCI), part of the National Institutes of Health, announced in October the funding of a new initiative that will expand its efforts to understand the relationship between obesity and cancer. The Transdisciplinary Research on Energetics and Cancer (TREC) initiative will support a diverse team of scientists from across the United States to integrate the study of diet, weight, and physical activity and their effects on cancer. It funds research centers that focus on energy balance and energetics (the study of the flow and transformation of energy through living systems) and will also provide training opportunities for new and established scientists to conduct research on energy balance and cancer.

Funded through cooperative agreements, the four research centers and one coordinating center will encompass projects ranging from the biology and genetics of energy balance to the behavioral, sociocultural, and environmental influences on nutrition, physical activity, weight, and energy balance. The coordinating center will facilitate interactions across the research centers and between NCI and the centers.

Case Western Reserve University in Cleveland, Ohio, will concentrate on cellular mechanisms using laboratory models and clinical research that focuses on obesity, metabolic dysfunction, and colorectal cancer risk. The Fred Hutchinson Cancer Research Center in Seattle, Washington, will focus on prevention of breast and colorectal cancers, with particular emphasis on diet and physical activity. The

project includes an integrated research program examining energy balance and its consequences in cells, animal models, and human subjects. The University of Minnesota in Minneapolis will focus on population studies that examine the causes of and effective prevention strategies for obesity in youth and families. The University of Southern California, Los Angeles will explore the physiologic, metabolic, genetic, behavioral, and environmental influences on obesity and cancer risk in minority children. The Fred Hutchinson Cancer Research Center also will serve as the coordination center for the TREC initiative. This center will support communication, dissemination, data sharing, and collaboration among the TREC centers and with NCI.

This initiative is one of many programs funded by the National Institutes of Health to understand and reduce the increasing prevalence of being overweight and of obesity in the United States. For more information about NCI's Transdisciplinary Research on Energetics and Cancer (TREC) initiative, visit <http://www.cancercontrol.cancer.gov/TREC>.

NIAID Launches Trial of "Global" HIV/AIDS Vaccine

A novel vaccine targeted to multiple human immunodeficiency virus (HIV) subtypes found worldwide has moved into the second phase of clinical testing, the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), announced in October. The study investigators plan to enrol 480 participants at sites in Africa, North America, South America, and the Caribbean to test the safety and immune response to the vaccine.

The experimental vaccine was developed by scientists at the NIAID Dale and Betty Bumpers Vaccine Research Center (VRC) and is being studied in the HIV Vaccine Trials Network (HVTN), a clinical research collaboration funded by NIAID's Division of AIDS. The unique vaccine combines synthetically modified elements of four HIV genes found in subtypes A, B, and C of the virus, the subtypes commonly found in Africa, the Americas, Europe, and parts of Asia. These subtypes represent about 85% of the HIV infections worldwide.

The trial, known as HVTN 204, is being coordinated with two other planned clinical studies—an unprecedented collaboration among researchers in three clinical trial networks and NIAID. The International AIDS Vaccine Initiative plans to conduct a phase I study of the VRC vaccine at sites in Kenya and Rwanda, and the US Military HIV Research Program plans phase I and II studies at sites in Uganda, Kenya, and Tanzania; the studies are contingent on the appropriate regulatory and ethical approvals being granted in these countries.

The three harmonized trials will be testing a "prime-boost" strategy composed of two vaccine components given at different times. Both contain synthetic versions of four HIV genes referred to as *GAG*, *POL*, *NEF*, and *ENV*. The *GAG*, *POL*, and *NEF* genes come from HIV subtype B, the primary virus found in Europe and North America. *ENV*, the fourth gene, codes for an HIV coat protein that allows the virus to recognize and attach to human cells. The vaccine incorporates modified *ENV* genes from subtypes A and C, most common in Africa and parts of Asia, as well as subtype B.

The two vaccine components differ in how the genes are packaged. One contains only the naked gene fragments, which cannot reconstitute into an infectious virus. The other uses a weakened type of respiratory virus known as adenovirus as a vector to shuttle the noninfectious gene fragments into the body.

Adenoviruses cause upper respiratory tract illness, such as the common cold. However, because the vaccine contains only HIV gene fragments housed in an adenovirus that cannot replicate, study participants cannot become infected with HIV or acquire a respiratory infection from the vaccine. It is hoped that this prime-boost approach incorporating adenovirus vector will generate the type and quantity of immune responses necessary to impact an infection such as HIV.

Heat-Related Illnesses in Heart Failure Patients

The first study to investigate how heat affects people with heart failure shows that one of two ways the body can cool itself is not as effective in those with congestive heart failure relative to healthy individuals. The results, published in the journal *Circulation*, emphasize the need for people with heart failure to take special care when the weather is hot. The researchers discovered no difference in sweating responses among study participants with heart failure or healthy subjects. However, the skin blood flow response in those with heart failure was significantly impaired, by as much as 50%, when compared with that of the control group.

Increased blood flow to skin serves as an efficient mechanism to dissipate body heat. A healthy person may pump three times as much blood as normal if the outside temperature is hot.

While physicians have long known anecdotally that people with heart failure are more susceptible to heat-related illnesses, the present study is the first to identify the mechanism for this difference.