

CLINICAL AND TRANSLATIONAL SCIENCE AWARDS

Advancing Scientific Discoveries Nationwide to
Improve Health

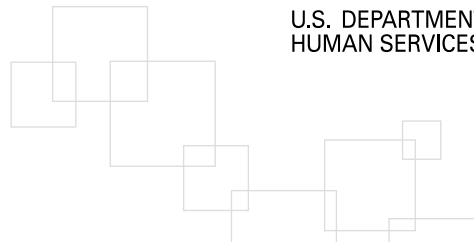


Progress Report
2006–2008



**National Center for
Research Resources**

**NATIONAL INSTITUTES OF HEALTH
U.S. DEPARTMENT OF HEALTH AND
HUMAN SERVICES**



Acknowledgments

The staff of the National Center for Research Resources extends gratitude and appreciation to the members of the Clinical and Translational Science Award consortium for providing insight, content and images for this publication.

Due to space constraints, we were unable to include all CTSA accomplishments. We will continue to capture these ongoing and transformative efforts in future NCRR publications and Web entries.

To stay current on CTSA achievements and events, visit www.CTSAweb.org.

On the Cover

The cover image illustrates the Clinical and Translational Science Award philosophy, which is to break down institutional barriers and foster team science, partnerships, collaboration and connectivity. Led by the National Center for Research Resources, part of the National Institutes of Health, the CTSA program aims to improve health by increasing the efficiency and quality of clinical and translational research nationwide. For more information, visit www.CTSAweb.org.

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National Center for Research Resources Director's Message



The Clinical and Translational Science Award (CTSA) program has formed a national consortium of research institutions that work together to transform the discipline of clinical and translational science. Now in its fourth year, the momentum behind the CTSA consortium continues to build as new connections are emerging within, across and beyond the consortium. From 2006 to 2008, 38 institutions became part of the consortium, spanning 23 states and a broad range of scientific expertise. East, West and Midwest regional consortia have formed, creating opportunities for nearby institutions to focus on shared goals with

greater efficiency. CTSA institutions are engaging their business schools as well to create more effective and transparent processes for leveraging resources into results.

The consortium — which gained eight new institutions in 2009 — also is working steadily to achieve its national priorities. During the past year, the consortium made substantial progress in improving the management of clinical research, in developing core competencies in clinical and translational science, and in accelerating the dissemination of research findings into clinical practice.

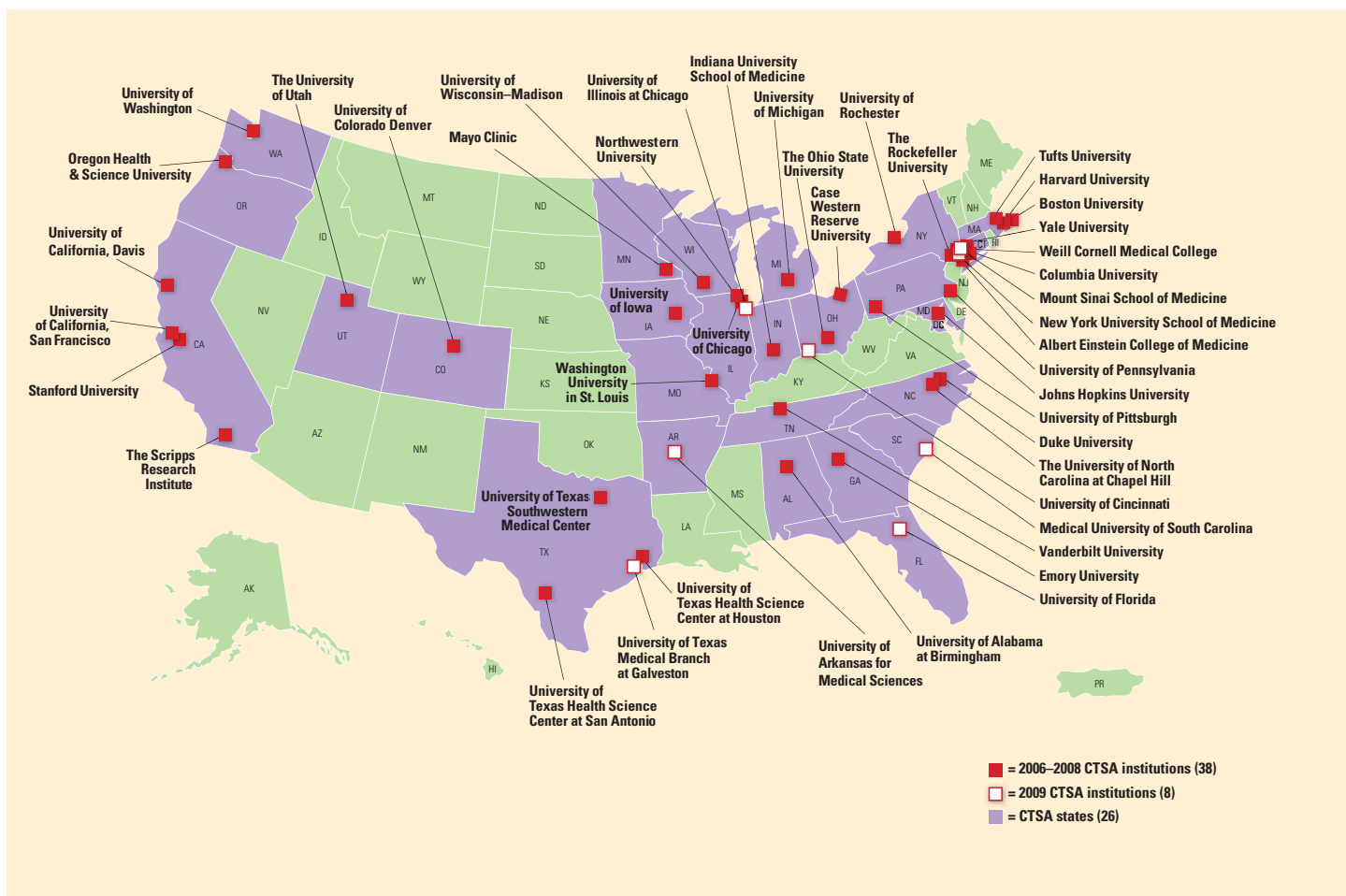
This progress — at local, regional and national levels — is in direct response to the need identified by many researchers, deans and members of scientific professional societies who, in 2005, advocated that the system of clinical research take a new direction. With its long-standing investments in basic, translational and clinical research, NCRR became the leader of an NIH effort to reengineer the clinical research enterprise. As the consortium matures, NCRR will continue to encourage and facilitate partnerships among grantees from all NCRR-supported programs to form a synergistic matrix of research resources and expertise.

Featured throughout this report are examples of the innovative partnerships and collaborations that already have formed as a direct result of the CTSA program. These partnerships are enabling researchers to work in unprecedented ways to advance medical research across many disease areas and conditions, including cancer, neurological diseases, cardiovascular disease, diabetes and obesity.

I hope you will share our excitement as you learn more about the progress that is emerging from the CTSA consortium. I encourage you to visit CTSAweb.org for continual updates.

Barbara Alving, M.D.

Barbara M. Alving, M.D., M.A.C.P.
Director, NCRR



Clinical and Translational Science Award Recipients

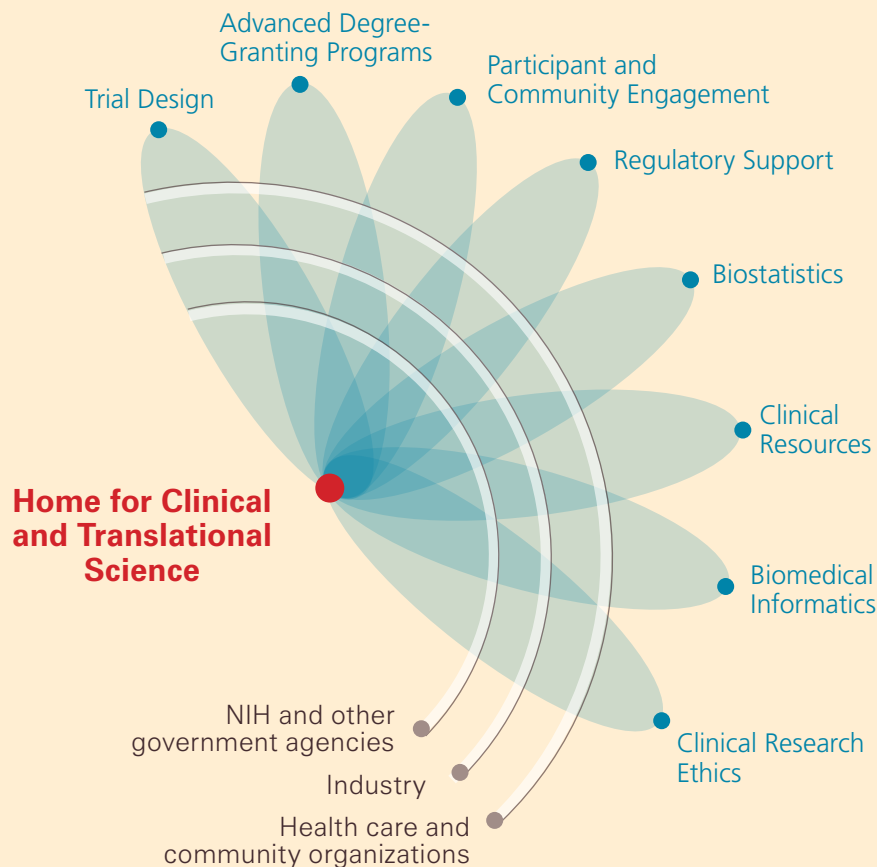
CTSA institutions speed clinical and translational research across the nation. The first 38 awards include representation from each geographic region of the country. Eight new CTSA institutions were added to the consortium in 2009.

The national CTSA consortium shares a common vision to:

- Improve the conduct of biomedical research across the country.
- Reduce the time it takes for laboratory discoveries to become treatments for patients.
- Engage communities in clinical research.
- Train a new generation of clinical and translational researchers.

1 Overview: Transforming Clinical and Translational Research

Launched in 2006 and led by the National Center for Research Resources (NCRR), the CTSA program is working at institutional, regional and national levels to create a discipline of clinical and translational science. Its primary mission is to more efficiently translate the rapidly evolving knowledge developed in basic biomedical research into treatments to improve human health. From 2006 to 2008, 38 academic health centers and research institutions in 23 states became part of the consortium. When fully implemented, approximately 60 institutions will be linked in a way that will energize the discipline of clinical and translational science with \$500 million per year of NIH funds. Diversity in the size, scope and geographic location of participating institutions strengthens the CTSA consortium and enhances its impact.



The Discipline of Clinical and Translational Science

Each CTSA institution has created a home for clinical and translational science. Components of the CTSA homes support specialized areas of research expertise, such as biostatistics, clinical trial design and community engagement. Input from NIH and other federal agencies, industry, and private and community organizations helps inform the work of each CTSA institution.

Local Institutional Transformation

Institutions that have received CTSA grants are bringing together disparate researchers and resources to create a central home for clinical and translational science within their organizations. This transformation provides opportunities to share resources and knowledge and breaks down silos to allow robust development of integrated research environments.

These research homes for clinical and translational science support almost 11,000 investigators with a broad range of expertise. The grantees embody the diverse, interdisciplinary approach necessary for clinical and translational research. The

Interdisciplinary Representation of CTSA Investigators

Advanced Degree	Number of Investigators
MD	3,456
PhD	2,578
Dual degrees	1,507
<i>MD-PhD</i>	988
<i>MD-MPH</i>	395
<i>PhD-MPH</i>	124
Other (public health, veterinary, nursing, dental)	172
No advanced degree or not reported	3,164

Specialty	Number of Investigators
Clinical disciplines (37 subcategories)	6,339
Pediatric disciplines	873
Public health	555
Genetics	270
Statistics, research methods, informatics	264
Bioengineering	248
Immunology	245
Neuroscience	243
Allied health	213
Psychology (nonclinical)	184
Nursing	172
Microbiology and infectious diseases	165
Physiology	153
Pharmacology	129
Biochemistry	128
Other	696
TOTAL	10,877

Based on data from individual annual progress reports from the first 38 CTSA institutions.

chart on page 5 illustrates the range of advanced degrees and specialties for investigators using CTSA resources. Equally significant, 692 trainees and scholars have been selected to pursue training in a range of disciplines.

CTSAs have launched interdisciplinary pilot projects that equip research teams to solve complex problems in medical research. Other institutional efforts are focused on supplying cost-effective, centralized biostatistical and informatics support. Each institution uses CTSA resources to provide improved regulatory oversight and assistance in patient recruitment. Efficiency in research management is a focus across the consortium.

CTSAs also seek ways to build diversity in leadership and enhance public trust by cultivating new partnerships to ensure that research results improve community practice. These institutions are reaching out to engage members of racial and



Findings on Fetal Immunity Could Improve Understanding of HIV

CTSA promotes collaboration for high-impact research

A multidisciplinary team of investigators based at the University of California, San Francisco, Clinical and Translational Science Institute has gained a new understanding of how the human fetal immune system develops. The team found that developing humans have special cells, known as regulatory T cells, that create tolerance between the fetus and the mother. The team determined that the fetal cells are generated by cells from the mother that cross the placenta into the fetus during pregnancy.

This new information may help researchers better understand how a fetus can adapt to and tolerate chronic infectious agents carried by a mother. For example, even if the mother is untreated, only 5 to 10 percent of infants whose mothers are HIV-positive are born with HIV. If maternal cells can induce tolerance in the fetus during pregnancy, the fetus also may develop some form of protective immunity to HIV infection during pregnancy. Such findings open up new avenues of research into HIV vaccines.

Funding partners with this CTSA included the National Institute of Allergy and Infectious Diseases; the National Heart, Lung, and Blood Institute; the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development; the NIH Office of the Director; and a host of nonprofit organizations and medical associations.

Sources and references listed on page 36.

ethnic minority groups as well as those living in rural or inner-city areas, many of whom suffer higher rates of disease, premature death and disability than do other populations.

Formal partnerships between three CTSA institutions and NCRR-supported Research Centers in Minority Institutions (RCMIs) illustrate this outreach to diverse populations. In Atlanta, Emory University partners with the Morehouse School of Medicine RCMI; in Nashville, Tenn., Vanderbilt University partners with the Meharry Medical College RCMI; and in New York City, Weill Cornell Medical College collaborates with the RCMI at Hunter College in CTSA efforts. Informal RCMI-CTSA partnerships also are forming across the nation as illustrated below in the collaboration between Rockefeller University (New York City) and the University of Texas at El Paso. Additionally, the University of Washington, a CTSA grantee, is engaged with academic institutions in Institutional Development Award (IDeA) states to create opportunities to reach rural populations.

Rockefeller University Boosts Research Potential in El Paso

CTSA and minority research program collaborate to improve child health

The effect of low but significant lead exposure on children's cognitive and motor function is the focus of an innovative partnership between researchers at Rockefeller University (New York City) and the University of Texas at El Paso. The partnership demonstrates the combined strength of NCRR's Research Centers in Minority Institutions (RCMI) and CTSA programs to improve health in minority communities.

RCMIs enhance research capacity and infrastructure at minority colleges and universities that offer doctorates in health sciences. The program serves the dual purpose of bringing more minority scientists into mainstream research and enhancing studies of minority health. At the University of Texas at El Paso, the RCMI-supported Border Biomedical Research Center initiated pilot studies of blood lead levels below the current threshold for toxicity in the El Paso border region, where 90 percent of the population is Hispanic/Mexican American.

The team's initial findings suggested that 25 percent of El Paso children had detectable lead levels below the current toxicity threshold but that these levels were associated with significant differences on measures of attention and motor behavior. This finding sparked a collaboration with researchers at Rockefeller University's Center for Clinical and Translational Science, which provided pilot funding to identify neurocellular changes using advanced staining techniques. With renewed CTSA funding, the team will continue developing an animal model to explore preliminary findings. Ultimately, this research could benefit the development and academic potential of minority and underserved children by identifying and preventing chronic exposure to low-level lead.

Sources and references listed on page 36.



CTSA institutions also are pursuing innovative and efficient ways to manage science by partnering with their local business schools. These partnerships are helping the CTSA's develop business plans, prepare cost analyses, protect CTSA-developed patents and form programs to partner with industry. For example, Harvard University's Linkages program combines the skills and resources available within Harvard's schools of law, business, engineering and applied sciences, and government along with the graduate schools of education and design to support innovation in clinical and translational research.

Similarly, Duke University has an active collaboration with the Health Sector Management program at its Fuqua School of Business, which addresses both health care and entrepreneurship. The University of California, Davis, has developed several programs to educate faculty regarding entrepreneurship, intellectual property and business development, with an emphasis on biotechnology. As institutions break down the walls between their research and business communities, they pave the way for more effective translational science.



Seattle Children's Hospital, an University of Washington Institute of Translational Health Sciences partner, is leading the way in applying continuous performance improvement methods to improve the basic building blocks of health care. Here, staff at Seattle Children's Hospital are learning about day-to-day operations from a clinician's perspective so they can work together to find better ways to deliver the highest quality service and value to patients while removing wasteful practices. *Photo courtesy of Seattle Children's Hospital*

University of Washington Applies Business Approach to Scientific Research

CTSA adapts the principles of Lean production to the clinic

Investigators at the Institute of Translational Health Sciences at the University of Washington in Seattle understand how business processes can improve research settings. The institute has embraced the principles of Lean production — distilling a process to its basic level and identifying redundant or wasteful steps.

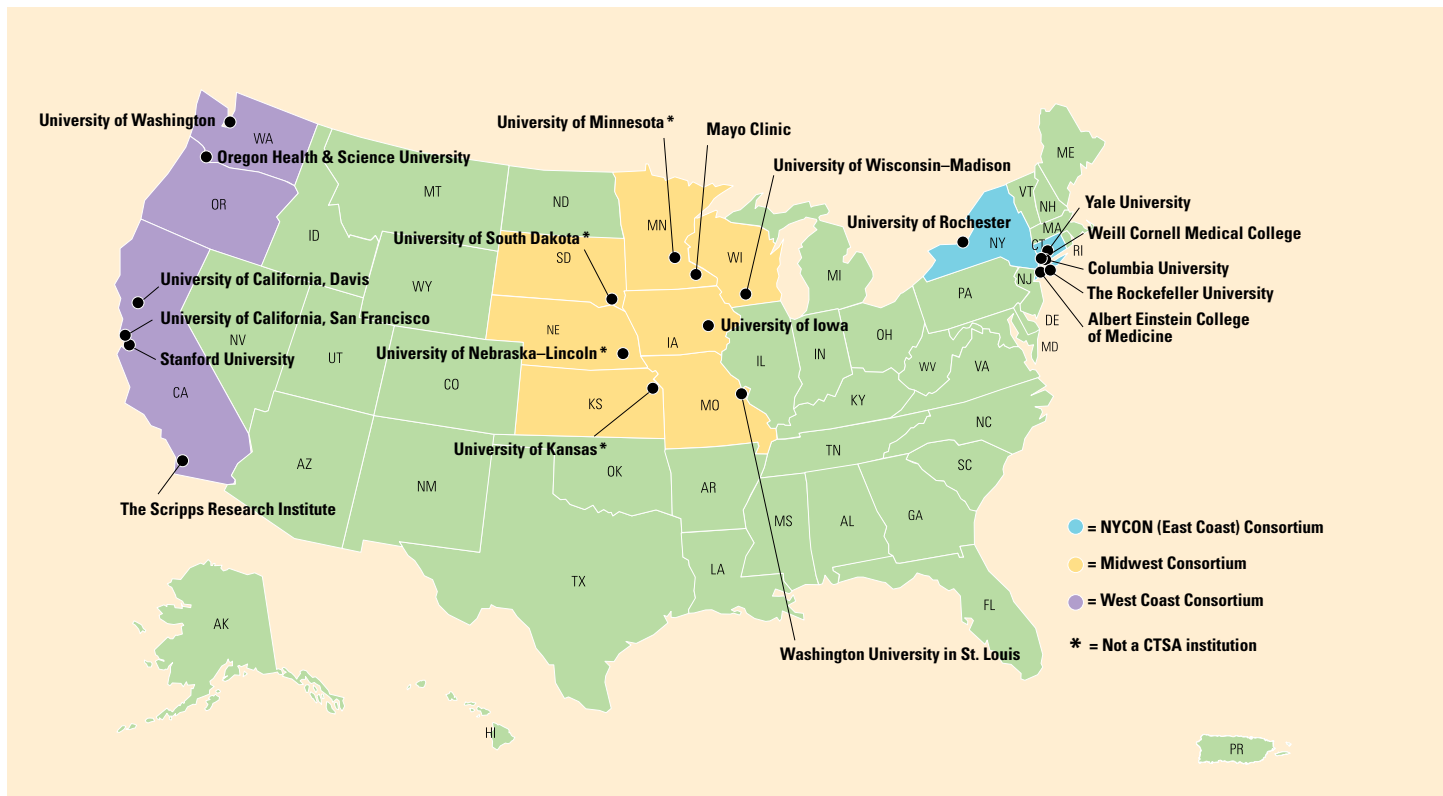
At Seattle Children's Hospital, where many University of Washington investigators conduct research, completion of the institutional review board (IRB) process included many time-consuming administrative steps. The application of Lean principles to IRB review slashed approval time nearly in half and dramatically reduced the number of necessary steps. Similarly, the institute simplified and streamlined the process of scheduling visits for research subjects through standardized methods, software and other tools. As a result, the number of no-shows decreased, staff efficiency improved and costs dropped.

The institute also facilitates collaborations to help investigators navigate the business world. Recently, researchers at the DNA Sequencing and Gene Analysis Center tapped expertise in the department of bioengineering, the school of business and the school of law to market successfully a novel device that enables administration of drugs directly to the brain. The university licensed the technology to its creators, who started a company to further develop the product.

Sources and references listed on page 36.

Regional Transformation

Several CTSA institutions in the East, West and Midwest have joined to form consortia to address regional challenges. For example, the West Coast consortium, comprised of six partners, is working to streamline clinical research management, ensure cost-effectiveness and improve the use of core resources. In November 2008, the NYCON CTSA consortium, comprised of representatives from Columbia University, Weill Cornell Medical College, Albert Einstein College of Medicine, University of Rochester, Rockefeller University and Yale University, met to discuss joint ventures and collaborations among their institutions and how to translate those results to the larger New York and Connecticut communities.



CTSA Regional Consortia

Regional alliances increase efficiencies and decrease costs by sharing core facilities and resources. Face-to-face meetings help foster cross-institutional relationships and opportunities to “learn about the best from the best” and to share best practices and lessons learned.

National Transformation

The distinguishing feature of the CTSA program is its charge to work together as a national consortium — bringing together research institutions with NCRR and other NIH Institutes and Centers (ICs) to advance priorities in clinical and translational science. Through close collaboration, the CTSA consortium is beginning to propose, disseminate and implement “best practices” and new policies, procedures, standards and systems to reduce roadblocks and accelerate the pace of research activities. The consortium has been designed to provide synergistic opportunities to advance research in clinical and translational science that otherwise may not have been available.



CTSA Web Site and Wiki Build Connections and Collaboration

CTSAweb.org was developed to ensure access to CTSA resources, enhance communication and encourage sharing. The site continues to evolve with the CTSA consortium in promoting the new discipline of clinical and translational science.

One feature, called *Building Connections*, helps CTSA researchers interact with each other; work with NIH; and strengthen existing relationships with businesses, the community and the public. *Building Connections* stimulates clinical and translational research alliances by identifying opportunities for collaboration among CTSA and private-sector organizations. It also highlights ways that CTSA are forming partnerships with their business schools to further enhance clinical and translational research.

Building Connections features:

- CTSA Principal Investigator Profiles
- Liaisons with the NIH ICs
- Public-Private Partnerships
- CTSA Interactions with Business Schools
- Regional CTSA Consortia Activities

Other features link visitors to CTSA Web sites throughout the consortium, scientific journal and news articles related to consortium activities, and the monthly CTSA newsletter. In addition, the *Resources for Researchers* feature includes a wealth of tools and resources from the consortium, NIH ICs, and other government agencies and private organizations.

To collaborate and share information beyond CTSAweb.org, consortium members use the CTSA wiki. Through an open, community-oriented Web environment, the wiki allows users to actively contribute and modify content in real time. It allows consortium members to collaborate on projects, services, news, program vision, emerging technology, documentation and more. The CTSA consortium initiated the wiki as an experimental framework for collaboration to provide value above and beyond conventional collaborative tools.

Sources and references listed on page 36.

The consortium is working to design new and improved tools for research in clinical informatics, forge new partnerships with private and public health care organizations, expand outreach to minority and medically underserved communities, develop better designs for clinical trials, and train a new generation of clinical and translational researchers.

Strategic Goals for the Consortium

To establish a national research agenda for the CTSA consortium, leaders of the CTSA consortium engaged in a strategic planning and implementation process to identify achievable goals that will drive consortium-wide activities. For each of the five overarching strategic goals, consortium leaders identified a single priority and deliverables to be met within the next 12–18 months.

Goal 1: Enhance national clinical and translational research capability

Improve the study process by reducing the time taken to approve, initiate and execute a clinical study. Steps to develop a data-driven process improvement include pilot studies to validate metrics at eight CTSA sites, national workshops, a cross-consortium study and standardized metrics. In two to three years, all sites are expected to develop data on the application of standard clinical study process metrics and changes in study initiation times.

Goal 2: Enhance training and career development of clinical and translational investigators

Open access to training resources across the CTSA consortium. Core competencies and curricula will be mapped and posted to a portal that will also include access to educational materials for portable media devices created by CTSA sites and their partners at the NIH Clinical Center, Centers for Disease Control and Prevention and others. The consortium will track the use of these materials through its Web site.

Goal 3: Enhance consortium-wide collaborations

Create a research networking capability that focuses on people. This capability will help basic and clinical junior researchers identify sources of knowledge and advice in local and distant research communities. The process will require the dissemination of informatics tools that already exist or are in development.

Goal 4: Enhance the health of our communities and the nation

- a) *Community engagement.* Link and facilitate collaboration among community-based research networks to implement research best practices aimed at improving the public's health and reducing health disparities.
- b) *Comparative effectiveness research.* Develop capacity and methods for translation of research results into practice across the health care system. Conduct a capacity and needs assessment of comparative effectiveness research and related resources throughout the CTSA sites to help articulate how the consortium can act as a portal to facilitate such research.

Goal 5: Develop and enhance strategies and resources for the efficient movement of T1 translational discoveries and knowledge into initial clinical testing

Assess the opportunities and barriers to T1 translation. The consortium will focus on three components for this goal: 1) education and training requirements for T1 investigators, with input from stakeholders (e.g., academia, industry and regulatory agencies); 2) collaborative demonstration projects to develop and implement the infrastructure to conduct proof-of-concept studies in humans across the different CTSA sites; and 3) innovative and novel models of technology transfer to advance translational projects.

2 Maximizing Return on Investments through Partnerships and Collaborations

In addition to providing homes for clinical and translational science, CTSA institutions contribute to the research process through innovative partnerships and collaborations. With a focus on expertise and resources, CTSA institutions benefit the research community by:

- Providing specialized infrastructure support to investigator-initiated project grants funded by NIH Institutes and Centers (ICs).
- Forming partnerships with research facilities that develop animal models to advance translational research.
- Bringing together multidisciplinary teams to create new fields of study or new uses for technologies.
- Engaging community partners to ensure research moves successfully into clinical practice.
- Creating public and private partnerships to speed innovation.

Examples of these unique contributions are provided below.

Benefits to the NIH-Funded Research Community

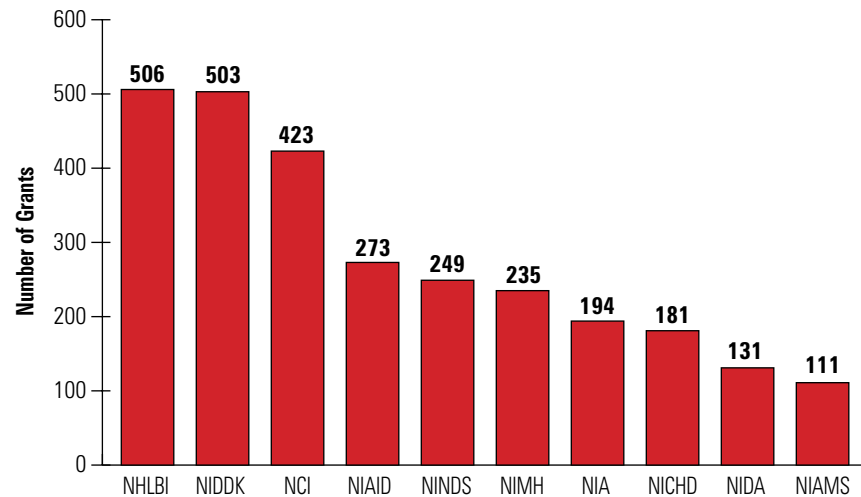
In support of a myriad of diseases and health issues, CTSA institutions are facilitating investigator-initiated research project grants (R01s) that are funded by other NIH ICs. By providing the research capacity investigators require to successfully conduct clinical and translational research, more than almost 11,000 researchers are benefiting from CTSA. Based on data from the CTSA institutions, more than 3,300 grants from 24 NIH ICs and the Office of the Director have utilized CTSA resources. Efficiencies are achieved through maximizing investments in core and other resources to support a wide range of researchers and projects.

In addition, from 2006 to 2008, 14 funding opportunity announcements issued by seven NIH ICs have encouraged the use of CTSA infrastructure and resources. The seven ICs include NCRR; National Center for Complementary and Alternative Medicine; National Heart, Lung, and Blood Institute; National Institute of Nursing Research; National Institute on Drug Abuse; National Institute of Diabetes and Digestive and Kidney Diseases; and National Institute of Mental Health.



Mayo Clinic CTSA KL2 scholar Kaye Reid Lombardo, M.D. (left), a pancreatic cancer researcher, with one of her mentors, cancer epidemiologist Gloria Petersen, Ph.D. *Photo courtesy of Mayo Clinic CTSA*

Top 10 NIH Institutes and Centers Using CTSA Resources



Based on data from individual annual progress reports from the first 38 CTSA institutions.



Collaborative Sleep Research Network First of Its Kind in U.S.

CTSA consortium enables multi-institutional, multidisciplinary research teams

The University of Pittsburgh’s Sleep Medicine Institute is the first center of excellence established by the university’s Clinical and Translational Science Institute. Within the CTSA consortium, the institute has organized the Sleep Research Network to bring together sleep medicine researchers from nearly two dozen CTSA institutions representing a variety of disciplines, including psychiatry, neurology, neuroscience, pulmonary medicine, cardiology, physiology, pediatrics, pharmacology, otolaryngology, dentistry, nursing, epidemiology and genetics.

At the network’s first meeting, researchers discussed childhood obstructive sleep apnea, a relatively frequent and potentially harmful condition that has few established evidence-based treatment options. Large, randomized, multicenter studies are needed to answer such questions as when to treat childhood obstructive sleep apnea and to identify phenotypes of the condition that could lead the way to personalized treatment.

The Sleep Research Network is the first of its kind in the United States and will help researchers pool resources, centralize databases, improve study recruitment and establish a framework for large studies. Working together, researchers can also leverage industry research dollars to advance the field of sleep medicine. The National Heart, Lung, and Blood Institute also supports research at Pittsburgh’s Sleep Medicine Institute through training grants.

Sources and references listed on page 36.

Building Partnerships with Translational Researchers

The potential to accelerate research discoveries from animal models into human trials is one of the many benefits of the expanding collaborations between NCRR-funded animal and clinical resources. Researchers with expertise in animal models (including mouse, rat and nonhuman primate models) are working with CTSA investigators on several pilot projects to help advance research on cardiovascular disease, ovarian cancer and other diseases. Through these collaborations, researchers leverage expertise and solve shared problems.

For example, the Rat Resource and Research Center (RRRC) at the University of Missouri, funded by NCRR's Division of Comparative Medicine, has forged a relationship with CTSA at Washington University in St. Louis, Duke University, Columbia University and Yale University to further drug discovery and development. The RRRC recently expanded its work with CTSA to use existing or to create new

Washington University Brings Advanced Technologies to Patient Studies

CTSA collaborates with technology center to identify a marker for cervical cancer

Personalized medicine promises to deliver more effective and efficient medical care by elucidating the molecular makeup of individual patients and their diseases. In particular, advanced technologies, such as those used for genomics and proteomics, can reveal the complex gene and protein patterns produced by a particular cell or tissue and identify “biomarkers” of disease.

Research conducted at Washington University in St. Louis demonstrates that interaction and collaboration among researchers who understand both the clinical and technical aspects of a complex medical problem is essential for these types of studies. Investigators at the Institute of Clinical and Translational Sciences partnered with the university's Resource for Biomedical and Bio-Organic Mass Spectrometry — an NCRR-supported Biomedical Technology Research Center — to identify biomarkers for cervical cancer, which kills about 500,000 women worldwide each year. By combining their expertise, the researchers found a way to unite the power of both genomic and proteomic approaches in a single study.

After extracting protein from normal and cancerous cervical tissue, the research team used mass spectrometry — a technology capable of sorting through thousands of proteins at once — to identify differences in the amounts of various proteins in the two cell types. The team compared these proteomic results to those of a genomics experiment, which measured the activity of thousands of genes in each sample. By assessing the overlap between the results, the researchers identified one gene that was produced in higher amounts in cancer cells. This gene, after further studies, may someday help researchers detect cervical cancer in women.

Sources and references listed on page 36.



animal models for preclinical trials of newly developed drugs. This collaboration will increase the speed of drug screening, allowing faster identification of drugs likely to fail in human clinical trials.

Currently, the RRRC-CTSA drug discovery/drug development program focuses on newly established models of genetically engineered rats with one or more genes “turned off” (known as knockout rat models). The collaboration also will provide CTSA researchers with animal models from the Mutant Mouse Regional Resource Center and the National Swine Resource and Research Center, both located at the University of Missouri. The program will speed the translation of drug research to clinical uses.

Sources and references listed on page 36.

Breaking Down Barriers to Cross-Institutional Collaboration

The CTSA approach provides a way for investigators from disparate disciplines and institutions to find each other and form teams, to gain open access to tools and technologies, and to obtain seed funding to embark upon new areas of investigation.



University of Rochester Pioneers Lipidomics

Through state-wide partnerships, CTSA establishes new field of research

Researchers at the University of Rochester (New York) are investigating the role of lipids — another word for fats, such as cholesterol — in a number of disease processes, pioneering the field of “lipidomics.” Recent research uncovered a previously unexpected role for complex lipids in resolving inflammation and regulating immune responses. As a result, researchers are developing tests to measure newly identified lipid mediators and discovering new insights into and biomarkers of different diseases.

A pilot grant through the University of Rochester’s Clinical and Translational Science Institute helped investigators reach outside the School of Medicine and Dentistry to other departments across the university, then around the state, including Cornell University and the Albany College of Pharmacy. The complexity of lipids and their relation to a variety of disease processes called for a multidisciplinary collaboration among experts in community and preventive medicine, proteomics, nutrition, and pharmaceutical research.

This spring, the team presented findings at meetings of the Arteriosclerosis, Thrombosis and Vascular Biology Council and the American Thoracic Society. Ongoing projects are evaluating the production of potent lipid mediators — lipids that mediate biological processes in the body — in healthy adults and their relationship with chest pain. The researchers also are expanding high-throughput laboratory technologies to help investigators throughout the larger biomedical community.

Sources and references listed on page 36.

Success in clinical and translational research requires not just expertise and technologies, but also a systematic effort to remove barriers to cross-institutional collaboration. Because speeding the reduction of human illness is the goal of the CTSA consortium, Harvard University and its partners called their CTSA the Harvard Catalyst. A catalyst lowers the barriers to reaction, thus accelerating a process that would normally occur at a much slower rate.

Along with its innovative Web site, Harvard Catalyst features Research Navigators — scientists who facilitate research by connecting investigators to one another and to needed resources. Harvard Catalyst uses these assets to bring together faculty, postdoctoral fellows, clinical trainees and graduate students from 10 schools and 18 academic health centers, stimulating new relationships in medicine, public health, law and government.

The Harvard Catalyst Web site connects users to a wealth of valuable information, such as ongoing clinical trials at Harvard, pilot funding opportunities, and multidisciplinary resources available through the university and its affiliates. The site also offers access to new tools, such as the Pathology Specimen Locator, a database of millions of specimens available for research, and Profiles, an investigator-focused social networking application. Harvard Catalyst leverages the university's long-established partnerships and assets, combining them with the broad capacity of the Internet to foster collaboration.

Sources and references listed on page 36.

Engaging the Community

CTSA institutions have leveraged NIH funding to attract support from within their institutions and from outside sources, including state governments, other federal agencies and private foundations. From 2006 to 2008, the 38 CTSA institutions established more than 350 academic, public and private partnerships. (See Chapter 4 for a full list of participating external partners.)

To achieve its purpose, translational research must engage members of racial and ethnic minority groups and people in rural and inner-city areas who face much higher rates of disease, premature death and disability than other populations. The key to this engagement, regardless of the type of program or population served, is two-way communication that establishes partnerships among researchers, health practitioners and community members.

By developing partnerships with federally qualified community health centers in four Iowa cities, the University of Iowa's Institute for Clinical and Translational Science is leveraging resources and expertise to increase this essential two-way communication. The centers deliver primary care to diverse populations, underrepresented minorities, and people who are under- or uninsured. Because community health center governance structures include community members,



collaborating with these centers provides an opportunity to improve the health of disadvantaged populations while engaging minority patients in clinical research.

The institute began by establishing a relationship with the Iowa/Nebraska Primary Care Association, which provides administrative support to community health centers. A group of association leaders, officers from each center and other personnel developed a formal framework for collaboration and identified high-priority clinical topics on which to focus. With CTSA funding, each center recruited a community coordinator to act as both a liaison and a health educator. The institute trains these coordinators in community-based participatory research, an approach that focuses on a topic important to the community and combines knowledge with action to achieve social change. Coordinators also learn methods of implementation science, which promotes the translation of research findings into routine health care.

In addition, community engagement leaders are working with the University of Iowa's institutional review board — which considers ethical, policy and regulatory issues regarding patient research — to develop procedures for university sponsorship of research conducted at community health centers.

Sources and references listed on page 36.



In Houston, Stephanie Martinez and her Briscoe Elementary School classmates are learning how to eat right, exercise and make healthy lifestyle choices with the help of a CTSA-supported program called CAN DO Houston. Launched in 2008, the program was created to combat the childhood obesity epidemic and is based on proven evidence-based principles. It is operated by the Center for Clinical and Translational Sciences at the University of Texas Health Science Center at Houston, which is part of the CTSA consortium. *Photo courtesy of UT Houston Health Science Center*

CAN DO Houston Translates Collaborative Science into Community Health

Through community engagement, CTSA improves health and well-being

Childhood obesity is a growing problem across the nation, but Texas bears a significantly high burden. Whereas 17 percent of elementary school students nationwide are obese, the number in the Lone Star State is closer to 25 percent.

The Center for Clinical and Translational Sciences at the University of Texas Health Science Center at Houston is working with civic leaders to shrink student waistlines. The center's Community Advisory Board identified obesity as one of two health concerns for targeted research. The other — type 2 diabetes — often results from obesity.

In 2008, the center partnered with the Mayor's Wellness Council and the Houston Wellness Association to launch a pilot project to fight obesity in two inner-city neighborhoods. The program — Children and Neighbors Defeat Obesity (CAN DO Houston) — applies the principles of the evidence-based Coordinated Approach to Child Health (CATCH) program to improve the health of children and their families. (The University of Texas School of Public Health developed the CATCH program with funding from the National Heart, Lung, and Blood Institute.)

CAN DO Houston provides after-school programs promoting physical activity and healthy snacks, cooking classes for parents and students, grocery store tours, and nutrition education. By encouraging children to adopt healthy lifestyles, the program aims to make a lasting impact on wellness for Houston's next generation.

Sources and references listed on page 36.

Because different communities have different needs, CTSA's must customize their approaches to collaborative, community-engaged research. At the Duke Center for Community Research, part of the Duke Translational Medicine Institute in Durham, N.C., researchers are collaborating to improve stroke prevention among Latino immigrants through partnerships with a local health care access program run by the university's Division of Community Health. A research team surveyed Latino immigrants' awareness of stroke, and the findings raised alarm: most could not identify one risk factor or symptom of stroke, and only half knew what to do if someone was having a stroke. Many respondents thought making a doctor's appointment was the only action needed.

The findings spurred the team to partner with El Centro Hispano, a nonprofit community-based organization, to develop a stroke awareness intervention program for Latino immigrants. El Centro Hispano has extensive knowledge of the Latino immigrant community and offers a broad range of health and education programs to Spanish speakers throughout Durham County. By combining CTSA and community resources and expertise, the effort will improve stroke prevention among this underserved patient population.

Sources and references listed on page 36.

Connecting Public and Private Partners

The CTSA program's overall mission is to speed the translation of scientific discoveries to improve human health. With this in mind, CTSA's have established partnerships with industry and patient advocacy groups to ensure that public and private organizations work together toward an integrated, efficient process for the development and translation of knowledge from laboratory bench to clinic bedside. These partnerships often break new ground and foster new technologies that speed innovation.

To make more treatments, diagnostics and devices available to patients and providers, the Oregon Clinical and Translational Research Institute has partnered with the Oregon Health & Science University Office of Commercialization to build robust industry partnerships. From 2007 to 2008, the number of industry-sponsored research agreements at the university rose by more than 50 percent, and the institute is a key contributor to the Office of Commercialization's outreach efforts to potential private-sector partners.

For example, the institute has established a joint pilot project program with Intel to support the development of new multi-sensing devices with health applications. The current project focuses on patients at high risk for stroke and on those with diabetes who may experience high- or low-blood glucose emergencies. The device couples state-of-the-art wireless and mobile technology



with various sensors to enable earlier detection and treatment of these common and life-threatening events.

The institute also has invested in the future of public-private partnerships by supporting training for future leaders. The university recently initiated a master's degree program in science management geared toward the bioscience industry. Current researchers can participate in workshops and seminars that introduce the fundamentals of translating research into commercial ventures and tap into a network of entrepreneurs and industry contacts.

Sources and references listed on page 36.

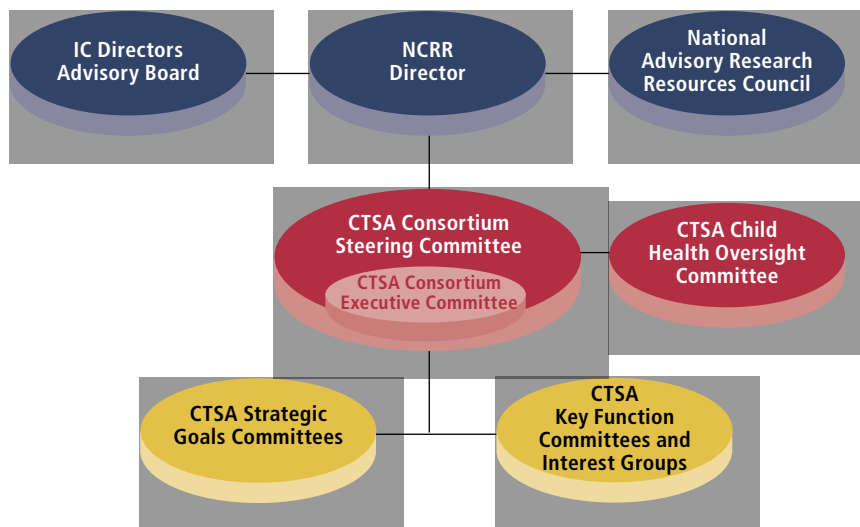
Bringing It All Together

Ground-breaking research occurs when varied stakeholders with a common mission are given the resources to work together. When translational investigators at Brigham and Women's Hospital need to locate clinical researchers and resources focused on Parkinson's disease, they can rely on Harvard's CTSA Research Navigators to help them make these critical connections. Through the CTSA consortium, the researchers find each other and can forge relationships that advance patient care. When Oregon researchers want to monitor patients more effectively and Intel seeks to expand its technology's reach, the CTSA program becomes a matchmaker.

From Spanish-speaking Latinos in Durham to the community health centers of Iowa, CTSA's provide platforms and resources to bring researchers and communities together. These examples forecast the impact the CTSA consortium will have on the clinical and translational research enterprise as it expands to link communities and clinicians to emerging research opportunities.

3 NIH CTSA Organization and Oversight

The oversight of a multifaceted program such as the CTSA consortium requires a dynamic governance structure. Oversight of the CTSA consortium comprises three distinct groups: advisory, steering and operational.



CTSA Consortium Strategic Goals

Goal 1: Enhance national clinical and translational research capability

Goal 2: Enhance training and career development of clinical and translational investigators

Goal 3: Enhance consortium-wide collaborations

Goal 4: Enhance the health of our communities and the nation

Goal 5: Develop and enhance strategies and resources for the efficient movement of T1 translational discoveries and knowledge into initial clinical testing

Steering and Oversight Committees

The CTSA Consortium Steering Committee (CCSC) is the core governing and decision-making body of the CTSA consortium. The steering committee comprises the principal investigators of each CTSA site and trans-NIH representatives. Each CTSA institution must agree to work toward adopting and implementing the policies and best practices that are approved by a two-thirds majority of the steering committee. The CTSA Consortium Executive Committee is made up of rotating members from the CCSC and provides leadership and guidance to the NCRR Director and the steering committee.

The CTSA Child Health Oversight Committee provides a unique national forum for CTSA investigators and NIH scientists to identify collaborative opportunities to facilitate pediatric clinical and translational research through the CTSA program. This oversight committee identifies barriers, sets priorities for developing collaborative solutions and standard approaches to the unique challenges in pediatric research, and recommends strategies to the CCSC that can be implemented across the CTSA program. The oversight committee also coordinates consortium-wide approaches to pediatric research needs.



Representatives from the CTSA and NIH serve on committees that focus on research areas or functions critical to the CTSA mission and enable informational exchange across the local institutions. Above (right to left), Ronald A. Thisted, Ph.D., Gerald Beck, Ph.D., and Mark J. Pletcher, M.D., M.P.H., participate in the Biostatistics / Epidemiology / Research Design Workgroup.

Strategic Goal and Operational Committees

The CTSA Strategic Goal Committees are responsible for achieving the strategic goals identified by the consortium. These committees comprise principal investigators from the steering committee and representatives from CTSA institutions and the NIH. Their task is to identify and prioritize the consortium-wide efforts undertaken so that the objectives and milestones of each strategic goal committee are achieved.

Working closely with the strategic goal committees are the CTSA Key Function Committees and Interest Groups, which focus on research areas or functions critical to the CTSA mission and enable informational exchange across local institutions. The composition and number of these committees and groups is dynamic, so they can respond to the needs of the CTSA community. They include representatives from the CTSA and the NIH.

Examples of Key Function Committees include:

- Clinical Research Management
- Community Engagement
- Education and Career Development
- Evaluation
- Informatics
- Public-Private Partnerships
- Translational Research

CTSA Interest Groups focus on topics that benefit the CTSA as well as the broader NIH community. Examples of topics of interest to these groups include comparative effectiveness research, emergency medicine, sleep research, critical care, neurology and neuroimaging.

Advisory Bodies

To provide additional oversight, the NCCR Director receives input and guidance from two advisory bodies, the Institute and Center Directors Advisory Board and the National Advisory Research Resources Council.

In addition to the advisory bodies, NIH staff from other ICs dedicate considerable time and energy to the CTSA effort. They participate on committees, organize workshops and meetings, and provide expertise in research areas specific to their ICs. Additionally, they inform the CTSA community of work being supported by the other NIH components, provide insight into lessons learned by other research centers and help reduce the potential for redundant efforts.

Program Evaluation

NIH recognizes the importance of accountability and the need to evaluate and demonstrate progress toward meeting the ambitious goals of the CTSA program. For this reason, each CTSA grantee is required to conduct an institutional evaluation and to submit an annual status report to NCRR. Institutional evaluators also participate in the CTSA consortium's Evaluation Key Function Committee, which provides an interactive forum to share and disseminate best practices and approaches to evaluating CTSA grantee programs.

Additionally, NCRR has hired external evaluators from Westat, a leading government services organization, to independently evaluate implementation of the CTSA program, to consider stakeholders' needs and perceptions, and to identify barriers to and facilitators of progress. As data are collected and as the program continues to mature, evaluation efforts will capture long-term outcomes and the impact the CTSA program has had on transforming the discipline of clinical and translational research.

4 Participating External Partners

In addition to working together as a consortium, CTSAAs bring together disparate organizations, institutions and community groups within their specific regions to foster highly engaged collaborative partnerships. The unique relationships among academic institutions, health community organizations and industry partners enhance clinical and translational research and are vital for the discovery and dissemination of innovation. The impact of the CTSAAs extends far beyond the host institutions as illustrated by the following list of participating external partners.

Alabama

University of Alabama at Birmingham

UAB Center for Clinical and Translational Science
www.ccts.uab.edu

Principal Investigator

Lisa M. Guay-Woodford, M.D.

Participating External Partners:

- Children's Health System
- Southern Research Institute
- HudsonAlpha Institute for Biotechnology
- Alabama's historically black colleges and universities

- VA Palo Alto Health Care System
- Northern California Cancer Center
- Santa Clara Valley Medical Center
- Gardner Family Health Network
- Community Health Partnership of Santa Clara County
- YMCA of the USA Activate America Program
- Mountain View-Los Altos Challenge Team
- Adolescent Pregnancy Prevention Network

The Scripps Research Institute

Scripps Translational Science Institute
www.stsiweb.org

Principal Investigator

Eric J. Topol, M.D.

Participating External Partners:

- The Neurosciences Institute
- J. Craig Venter Institute
- San Diego Supercomputer Center
- Genomics Institute of the Novartis Research Foundation
- Salk Institute
- Center for Applied Genomics at Children's Hospital of Philadelphia
- San Diego State University
- Burnham Institute for Medical Research
- Whittier Institute for Diabetes
- County of San Diego free clinics
- Community Health Improvement Partners

California

Stanford University

Spectrum: The Stanford Center for Clinical and Translational Education and Research
http://sccter.stanford.edu

Principal Investigator

Harry B. Greenberg, M.D.

Participating External Partners:

- Kaiser Permanente Division of Research
- Palo Alto Medical Foundation for Health Care, Research and Education

- San Diego Border Area Health Education Center
- Chula Vista Family Health Center
- Southeast San Diego elementary schools
- Retinal Consulting Services
- Indian Health Council, Inc.
- 15 community health centers
- 25 San Diego area life science companies

University of California, Davis

UC Davis Clinical and Translational Science Center

www.ucdmc.ucdavis.edu/ctsc

Principal Investigator

Lars Berglund, M.D., Ph.D.

Participating External Partner:

- Sacramento VA Medical Center

University of California, San Francisco

UCSF Clinical and Translational Science Institute
<http://ctsi.ucsf.edu>

Principal Investigator

S. Clay Johnston, M.D., Ph.D.

Participating External Partners:

- Children's Hospital and Research Center Oakland
- Kaiser Foundation Research Institute
- San Francisco VA Medical Center
- J. David Gladstone Institutes
- Blood Systems Research Institute, Blood Centers of the Pacific
- Jewish Home for the Aged

Scripps Pioneers Wireless Health Care Research

CTSA partners with industry to provide training opportunities in emerging field

Wireless health care is emerging as an innovative new field of medical research, and the Scripps Translational Science Institute near San Diego is ready to capitalize on its potential for improving health worldwide. The institute partnered with wireless telecommunications company Qualcomm to launch the world's first physician-scholar training program on wireless health care research in summer 2009.

Enrolled physicians will spend two years at Scripps studying wireless health care technology and applications, including work with Qualcomm engineers to develop sensors or conduct clinical trials to test and validate wireless health technologies. For example, they could study whether continuous monitoring of blood pressure or glucose levels improves patients' clinical outcomes.

The CTSA program served as the catalyst that connected Scripps to Qualcomm and other technology firms. San Diego is home to countless wireless technology resources, and Scripps sought to create an institute that would draw on those resources to pioneer wireless health care applications. Within the CTSA consortium, the institute is positioned to become an invaluable resource for this emerging, high-impact field of research.

Sources and references listed on page 36.



Colorado

University of Colorado at Denver

Colorado Clinical and Translational
Sciences Institute
<http://ctsa1.uchsc.edu>

Principal Investigator
Ronald J. Sokol, M.D.

Participating External Partners:

- The Children's Hospital
- Denver Health
- National Jewish Medical and Research Center
- Kaiser Permanente of Colorado
- Denver VA Medical Center
- Colorado Foundation for Public Health and the Environment
- Colorado Pharmacy Practice Education and Research Network
- Rocky Mountain Altitude Network
- CaReNet—The Colorado Research Network
- National Surgical Quality Improvement Program
- Nurse-Family Partnership
- Colorado Cardiovascular Outcomes Research
- Catholic churches
- Population-based Palliative Care Research Network
- LUCAR (Latinos Using Cardio Health Actions to Reduce Risk)
- Denver Metro Emergency Network
- Stapleton 2040
- American Academy of Family Physicians National Research Network
- Colorado Children's Healthcare Access Program
- Building Investigative Practices for Better Health Outcomes Research Network
- High Plains Research Network

Connecticut

Yale University

Yale Center for Clinical Investigation
www.ycci.yale.edu

Principal Investigator
Robert S. Sherwin, M.D.

Participating External Partners:

- Rat Resource and Research Center, University of Missouri
- Rockefeller University
- Mayo Clinic
- Pfizer, Inc.
- Advanced Practice Registered Nurse Research Network
- Fair Haven Community Health Center
- New Haven public schools
- Community Mediation, Inc.
- Hispanos Unidos, Inc.
- Hospital of St. Raphael

Georgia

Emory University

Atlanta Clinical and Translational
Science Institute
www.actsi.org

Principal Investigator
David S. Stephens, M.D.

Participating External Partners:

- Morehouse School of Medicine
- Georgia Institute of Technology
- Children's Healthcare of Atlanta
- Georgia Research Alliance
- Kaiser Permanente
- Georgia Bio (formerly Georgia Biomedical Partnership)
- Atlanta VA Medical Center
- Centers for Disease Control and Prevention
- Grady Memorial Hospital
- University of Georgia

Illinois

Northwestern University

Northwestern University Clinical and Translational Sciences Institute
www.nucats.northwestern.edu

Principal Investigator
Philip Greenland, M.D.

Participating External Partners:

- Children’s Memorial Hospital
- Rehabilitation Institute of Chicago
- Infant Welfare Society of Chicago
- Consortium to Lower Obesity in Chicago Children
- Chicago Metropolitan Agency for Planning
- Center for Cultural Understanding and Change at the Field Museum

University of Chicago

University of Chicago Institute for Translational Medicine
http://itm.uchicago.edu

Principal Investigator
Julian Solway, M.D.

Participating External Partners:

- Argonne National Laboratory
- Illinois Institute of Technology
- Access Community Health Network
- Advocate Health Care
- Advocate Medical Group
- Family Physicians Inquiries Network
- Federation of Practice Based Research Networks
- Advocate Christ Medical Center
- University Health System Consortium
- Chicago Family Health Center
- Advocate Lutheran General Hospital
- Advocate Hope Children’s Hospital
- National Black Nurses Association, Chicago Chapter

New Research Helps Doctors Predict Response to Vaccine

CTSA provides bioinformatics expertise to speed research discovery

A multi-institutional team led by the NCCR-supported Yerkes National Primate Research Center, a part of Emory University in Atlanta, recently published a method to predict the success of a vaccine in creating immunity without exposing individuals to infection. Researchers studied the highly effective vaccine for yellow fever, which has been given to nearly half a billion people over the past 70 years.

The team analyzed T-cell and antibody responses in the blood of healthy individuals who received the vaccine, then determined the common gene “signatures” that contribute to developing immunity in response. To sort through the complex and mixed data, they employed a bioinformatics technique developed by an expert from the Georgia Institute of Technology, an Atlanta Clinical and Translational Science Institute partner. Using this technique, researchers identified distinct gene signatures that correlated with the vaccine responses with up to 90 percent accuracy. The ability to predict who would respond to a vaccine and to determine quickly its efficacy will be a tremendous help to researchers developing new vaccines.

The National Institute of Allergy and Infectious Diseases, National Institute of Diabetes and Digestive and Kidney Diseases, Sanofi Pasteur, and the Bill and Melinda Gates Foundation also contributed funding for this research.

Sources and references listed on page 36.



Indiana

Indiana University School of Medicine

Indiana Clinical and Translational Science Institute
www.indianactsi.org

Principal Investigator
Anantha Shekhar, M.D., Ph.D.

Participating External Partners:

- Purdue University
- BioCrossroads
- Clarian Health Partners
- Cook Group Incorporated
- Eli Lilly and Company
- Richard M. Fairbanks Foundation
- Fairbanks Institute for Healthy Communities
- Indiana state government
- Indiana Health Information Exchange
- Indiana Network for Patient Care
- Regenstrief Foundation
- Regenstrief Institute
- Roudebush VA Medical Center
- WellPoint, Inc.
- Wishard Health Services

Iowa

University of Iowa

University of Iowa Institute for Clinical and Translational Science
<http://icts.uiowa.edu>

Principal Investigator
Gary W. Hunninghake, M.D.

Participating External Partners:

- Iowa/Nebraska Primary Care Association
- Primary Health Care, Inc.
- Community Health Care
- Peoples Community Health Clinic, Inc.
- Siouxland Community Health Center

Maryland

Johns Hopkins University

Johns Hopkins Institute for Clinical and Translational Research
<http://ictr.johnshopkins.edu>

Principal Investigator
Daniel E. Ford, M.D., M.P.H.

Participating External Partners:

- Kennedy Krieger Institute
- Massachusetts Institute of Technology

Massachusetts

Boston University

Boston University Clinical and Translational Science Institute
www.bu.edu/ctsi

Principal Investigator
David M. Center, M.D.

Participating External Partners:

- Boston Medical Center
- VA Boston Healthcare System
- Framingham Heart Study
- Boston HealthNet
- National Emerging Infectious Diseases Laboratories
- Center for Research to Evaluate and Eliminate Dental Disparities
- Partners in Health and Housing Prevention Research Center

Harvard University

Harvard Catalyst: The Harvard Clinical and Translational Science Center
<http://catalyst.harvard.edu>

Principal Investigator
Lee Marshall Nadler, M.D.

Participating External Partners:

- Beth Israel Deaconess Medical Center
- Brigham and Women's Hospital
- Children's Hospital Boston
- Dana-Farber Cancer Institute

- Forsyth Institute
- Joslin Diabetes Center
- Massachusetts Eye and Ear Infirmary
- Massachusetts General Hospital
- McLean Hospital
- Mount Auburn Hospital
- Schepens Eye Research Institute
- Spaulding Rehabilitation Hospital
- VA Boston Healthcare System
- Massachusetts Institute of Technology
- Broad Institute
- Cambridge Health Alliance

Tufts University

Tufts Clinical and Translational
Science Institute
www.tuftsctsi.org

Principal Investigator

Harry Selker, M.D., M.S.P.H.

Participating External Partners:

- New England Quality Care Alliance
- Jean Mayer USDA Human Nutrition Research Center on Aging
- Brandeis University's Heller School and Schneider Institutes for Health Policy
- Framingham Heart Study
- Northeastern University's Bouvé College of Health Sciences
- University of Massachusetts School of Nursing
- National Kidney Foundation
- Asian American Center for Cancer Education and Research
- Boston Chinatown Neighborhood Center
- Museum of Science, Boston
- City of Boston Department of Neighborhood Development
- Boston Public Health Commission
- Center for Community Health Education, Research and Service
- Codman Square Health Center/ Dorchester House Multi-Service Center of the Dorchester Health Initiative
- La Alianza Hispana

- Massachusetts Department of Public Health
- Partners for a Healthy Community
- Somerville Community Health Agenda, Institute for Community Health
- Blue Cross Blue Shield of Massachusetts
- Advanced Magnetics, Inc.
- Biogen Idec
- Millennium Pharmaceuticals, Inc.
- NeuroLogica Corporation
- Pfizer, Inc.

Michigan

University of Michigan

Michigan Institute for Clinical and Health Research
www.michr.umich.edu

Principal Investigator

Kenneth J. Pienta, M.D.

Participating External Partner:

- Michigan State University

Minnesota

Mayo Clinic College of Medicine

Mayo Clinic Center for Translational Science Activities
<http://ctsa.mayo.edu>

Principal Investigator

Robert A. Rizza, M.D.

Participating External Partners:

- University of Puerto Rico School of Medicine
- University of Puerto Rico Allied Health Studies
- University of Mississippi Medical Center
- Center for Minority Health, University of Pittsburgh Graduate School of Public Health
- Arizona State University
- Vanderbilt University

- University of Minnesota
- Winona State University
- Hawthorne Education Center
- Olmsted County Community Healthcare Access Collaborative
- Olmsted County Public Health Department
- Olmsted Medical Center
- Plainview Migrant Council
- Fond du Lac Band of Lake Superior Chippewa
- Prairie Island—Mdewakanton Dakota Community
- New Sudan American Hope Group
- Centro Campesino
- Alianza Chicana Hispana Latino Americana
- African Descendants Support Network
- Hispanic Diversity Interest Group
- Intercultural Mutual Assistance Association
- Rochester Area Foundation
- The Center Clinic
- Office of Minority and Multicultural Health, Minnesota Department of Health
- Deborah E. Powell Center for Women's Health, University of Minnesota
- Migrant Head Start

Missouri

Washington University in St. Louis

Washington University Institute of Clinical and Translational Sciences
<http://icts.wustl.edu>

Principal Investigator

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Participating External Partners:

- St. Louis Children's Hospital
- Barnes-Jewish Hospital
- Saint Louis University
- St. Louis College of Pharmacy
- Southern Illinois University Edwardsville School of Nursing
- University of Missouri—St. Louis College of Nursing

Participating External Partners

New York

Albert Einstein College of Medicine of Yeshiva University

Einstein-Montefiore Institute for Clinical and Translational Research
www.aecom.yu.edu/ictr

Principal Investigator

Harry Shamoon, M.D.

Participating External Partners:

- Montefiore Medical Center
- Children's Hospital at Montefiore
- The Bronx Health Link
- Clinical Directors Network
- College of New Rochelle School of Nursing
- Lehman College, City University of New York
- New York City Department of Health and Mental Hygiene
- Beth Israel Medical Center
- North Bronx Healthcare Network/Jacobi Medical Center

Columbia University

Irving Institute for Clinical and Translational Research
<http://irvinginstitute.columbia.edu>

Principal Investigator

Henry Ginsberg, M.D.

Participating External Partners:

- St. Luke's-Roosevelt Hospital Center Institute for Health Sciences
- Research Foundation for Mental Health Hygiene, Inc.

The Rockefeller University

Rockefeller University Center for Clinical and Translational Science
www.rockefeller.edu/ccts

Principal Investigator

Barry Collier, M.D.

Participating External Partners:

- Aaron Diamond AIDS Research Center
- Rogosin Institute
- American Skin Association

University of Rochester

University of Rochester Clinical
and Translational Science Institute
<http://www.urmc.rochester.edu/ctsi>

Principal Investigator

David S. Guzick, M.D., Ph.D.

Participating External Partners:

- Albany College of Pharmacy
- Albany Medical College
- Bassett Healthcare
- Binghamton University
- Cornell University
- Guthrie Health
- Ordway Research Institute
- Rensselaer Polytechnic Institute
- Roswell Park Cancer Institute
- School of Public Health, University at Albany, State University of New York
- University at Buffalo, State University of New York
- SUNY Upstate Medical University

Weill Cornell Medical College

Clinical and Translational Science Center
www.med.cornell.edu/ctsc

Principal Investigator

Julianne L. Imperato-McGinley, M.D.

Participating External Partners:

- Hospital for Special Surgery
- Hunter College, City University of New York
- Memorial Sloan-Kettering Cancer Center
- NewYork-Presbyterian Hospital, Weill Cornell Medical Center Campus

North Carolina**Duke University**

Duke Translational Medicine Institute
www.dtmi.duke.edu

Principal Investigator

Robert Califf, M.D.

Participating External Partners:

- Alliance of AIDS Services-Carolina
- Alternative Care Treatment Systems, Inc.
- BAART Community Health Care
- Community Health Coalition
- Covenant Presbyterian Church in Durham
- Duke Legal AIDS Project
- Durham CAN: Congregations, Associations, and Neighborhoods
- Durham Chamber of Commerce
- Durham County Department of Social Services
- Durham County Health Department
- Durham Parks and Recreation
- Durham Police Department
- Durham public schools
- Durham YMCA
- Durham's Partnership for Children
- Easter Seals UCP North Carolina
- El Centro Hispano
- El Pueblo, Inc.
- Generation Fit
- Healing with CAARE Inc., Jeanne Lucas Education and Wellness Center
- Housing and Community Development Department
- Inter-Faith Food Shuttle
- Lincoln Community Health Center
- Metropolitan Durham Medical Group
- M-POWERHOUSE of the Triangle
- National Kidney Foundation of North Carolina
- Nehemiah Christian Center Church
- North Carolina Central University
- Northside Baptist Church
- Old West Durham Neighborhood Association
- Partnership Effort for Advancement of Children's Health/Clear Corps
- Piedmont HIV Health Care Consortium
- Planned Parenthood of Central North Carolina
- Project Access of Durham County
- Senior PharmAssist
- Seniors Staying Put, Inc.
- Sister Network, Durham/Triangle Chapter
- Southern Anti-Racism Network
- St. James Family Life Center

- St. John’s Missionary Baptist Church
- Strong Parental Involvement in Community Education
- Susan G. Komen for the Cure, North Carolina Triangle Affiliate
- The Durham Center
- Triangle J Area Agency on Aging
- Turning Corners Alliance
- University of North Carolina at Chapel Hill
- Union Baptist Church

University of North Carolina at Chapel Hill

North Carolina Translational and Clinical Sciences Institute
<http://tracs.unc.edu>

Principal Investigator
Etta Pisano, M.D.

Participating External Partners:

- RTI International
- Area L Health Education Center

- Coastal Area Health Education Center
- Carolinas Medical Center
- North Carolina State University
- North Carolina Central University
- Eastern Carolina University
- North Carolina Agricultural and Technical State University

Ohio

Case Western Reserve University

Clinical and Translational Science Collaborative
<http://casemed.case.edu/ctsc>

Principal Investigator
Pamela B. Davis, M.D., Ph.D.

Participating External Partners:

- Cleveland Clinic Foundation
- University Hospitals Case Medical Center
- MetroHealth Medical Center



Oregon Institutions Partner to Enhance Science Education Opportunities

CTSA collaborates with NCRR grantee to promote family health and wellness

Interactions between NCRR’s Science Education Partnership Awards (SEPA) and CTSA institutions are taking place across the country. These collaborations help researchers and educators reach out to communities, bringing health messages to a wider audience while building awareness of the value of clinical research.

To encourage families to pursue healthy nutrition and physical activity together, the Oregon Museum of Science and Industry in Portland relied on SEPA funding to create touring exhibitions in collaboration with the Small Museum Research Collaborative. The exhibitions — Every Body Eats and Let’s Get Active! — tour small museums nationwide and present current research and its impact on personal and family wellness in English and Spanish.

To improve the visitor experience at the exhibitions, the museum and the collaborative also produced educational materials and programs, including a Web site, teachers’ guides, family take-home guides and interactive presentations. Local scientists at Oregon Health & Science University and the CTSA-funded Oregon Clinical and Translational Research Institute helped develop the exhibitions and supporting materials. The exhibitions target families and K–5 school group visitors to small science and children’s museums in rural and small urban communities. The museum estimates that more than 2 million people will visit the exhibitions during their national tours, which will continue for at least eight years.

Sources and references listed on page 36.

Ohio State University

Center for Clinical and Translational Science
<http://ccts.osu.edu>

Principal Investigator
 Rebecca Jackson, M.D.

Participating External Partners:

- Nationwide Children's Hospital
- Battelle Memorial Institute
- Appalachia Community Cancer Network
- State of Ohio Comprehensive Program for the Prevention, Detection and Treatment of Lung Cancer
- Kroger Company
- Faith Mission
- Ohio public schools
- Metro Early College High School
- Primary Care Research Network
- Columbus Osteopathic Association

Oregon**Oregon Health & Science University**

Oregon Clinical and Translational Research Institute
www.octri.org

Principal Investigator
 Eric Orwoll, M.D.

Participating External Partners:

- Kaiser Foundation Research Institute
- Intel Corporation
- Portland VA Medical Center
- Portland State University

Pennsylvania**University of Pennsylvania**

Institute for Translational Medicine and Therapeutics
www.itmat.upenn.edu

Principal Investigator
 Garret A. FitzGerald, M.D.

Participating External Partners:

- Children's Hospital of Philadelphia
- University of the Sciences in Philadelphia
- Monell Chemical Senses Center
- Wistar Institute

University of Pittsburgh

Clinical and Translational Science Institute
www.ctsi.pitt.edu

Principal Investigator
 Steven E. Reis, M.D.

Participating External Partners:

- Carnegie Mellon University
- Children's Hospital of Pittsburgh
- Urban League of Greater Pittsburgh, Inc.
- Highmark Blue Cross Blue Shield
- RAND Corporation

Tennessee**Vanderbilt University**

Vanderbilt Institute for Clinical and Translational Research
www.mc.vanderbilt.edu/victr/pub

Principal Investigator
 Gordon R. Bernard, M.D.

Participating External Partners:

- Children's Hospital Boston
- Cincinnati Children's Hospital Medical Center
- Cornell University
- Emory University
- Food Security Partners of Middle Tennessee
- Harbor-UCLA Medical Center
- Mayo Clinic
- Medical College of Wisconsin
- Medical University of South Carolina
- Case Western Reserve University
- Meharry Medical College
- Nashville Metro Health Department
- Nashville CARES
- Nashville Community Coalition for Youth Safety

- Nashville Community Health and Wellness Team
- Nashville Health Disparities Coalition
- Nashville Latino Health Coalition/ Progreso Community Center
- Neighborhoods Resource Center
- Northwestern University
- Oregon Health & Science University
- Street Works
- Tennessee Department of Health
- Tennessee Institute of Public Health
- Tennessee Tribune
- Rockefeller University
- Tokai University
- University of California
- University of Medicine and Dentistry of New Jersey
- University of New Mexico
- University of North Carolina at Chapel Hill
- University of Pittsburgh Medical Center
- University of Puerto Rico
- Yale University

Texas

University of Texas Health Science Center at San Antonio

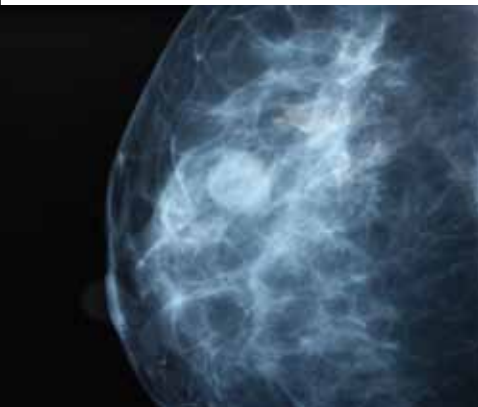
Institute for Integration of Medicine and Science
<http://iims.uthscsa.edu>

Principal Investigator

Robert A. Clark, M.D.

Participating External Partners:

- CHRISTUS Santa Rosa Children's Hospital
- San Antonio Metropolitan Health District
- San Antonio Military Medical Center
- South Texas Veterans Health Care System
- Southwest Foundation for Biomedical Research
- University Health System



Diamond in the Data: Software Enhances Breast Cancer Diagnosis

Through collaboration, CTSA creates new technologies for disease detection

Through the Novel Clinical and Translational Methodologies Core at the University of Pittsburgh's Clinical and Translational Science Institute, a multidisciplinary collaboration has harnessed innovative computer software to improve the diagnosis of breast cancer. A team of researchers from Intel and Carnegie Mellon University (both CTSA collaborators) developed Diamond, an open-source software that rapidly scans large repositories of loosely structured data — such as digital photographs and medical images — to create a platform that allows researchers to mine these data.

By working with clinicians and clinical scientists at the University of Pittsburgh, the research team found a new approach to detecting breast cancer. Researchers applied Diamond's interactive search capacity to a large reference collection of breast lesions identified on mammography and pathology. They assembled a reference database of thousands of annotated cases of benign and malignant lesions, confirmed by traditional computer-assisted diagnosis. Now radiologists can compare a given lesion with annotated reference cases, improving the accuracy of breast cancer diagnosis. The institute plans to translate this first known medical application of Diamond into clinical practice.

Sources and references listed on page 36.

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- Wisconsin Network for Health Research
- Meriter Hospital



Translational research involves multidisciplinary research teams. No one knows that better than Joel Perlmutter (center), director of the Brain, Behavior and Performance Unit (BBPU) at the Washington University in St. Louis Institute of Clinical and Translational Sciences — a CTSA consortium member. The BBPU plays a critical role in the translation of basic research findings to treatment for patients by providing collaboration, consultation and training for clinical research studies of the nervous system. Here, Perlmutter is shown collaborating with scientists at another CTSA-funded resource, the Human Imaging Unit. Photo by Scott Ferguson, FK Photo

Conclusion

Although still in the early stages of developing a national consortium, CTSA institutions are demonstrating transformative effects in clinical and translational research at the local, regional and national levels. Through continued close collaboration and dynamic partnerships, the CTSA consortium will leverage its knowledge and resources to realize a clinical and translational research enterprise that benefits from policies, procedures, standards and systems to accelerate the pace of scientific discovery and improve human health.

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NCRR Glossary

Biomedical Technology Research Center (BTRC): This program creates critical, often unique, technology and methods for application to a broad range of basic, translational and clinical research and fosters synergistic interactions of technical and biomedical expertise, both within the resources and through intensive collaborations with other leading laboratories, to provide other biomedical researchers with training and access to new tools and methodologies.

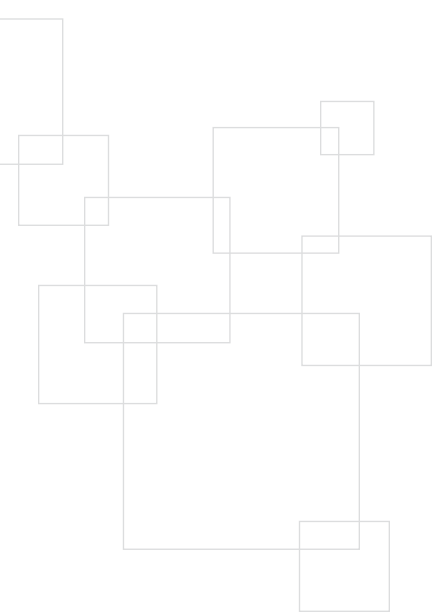
Clinical and Translational Science Award (CTSA): Through a national consortium, CTSA's are improving how biomedical research is conducted across the nation. The consortium's goals are to reduce the time it takes for laboratory discoveries to become treatments for patients and to train the next generation of clinical researchers.

Institutional Development Award (IDeA): This program fosters health-related research and increases the competitiveness of investigators at institutions in 23 states and Puerto Rico with historically low aggregate success rates for grant awards from NIH. The two major initiatives of the IDeA program are IDeA Networks of Biomedical Research Excellence (INBRE) and Centers of Biomedical Research Excellence (COBRE).

National Primate Research Center (NPRC): The major goal of the NPRC program is to facilitate the use of nonhuman primates (NHPs) as models of human health and disease for basic, translational and clinical biomedical research. It provides animals, facilities and expertise in all aspects of NHP biology and husbandry through funding to eight institutions.

Research Centers in Minority Institutions (RCMI): The goal of the RCMI program is to develop and enhance the research infrastructure of minority institutions to expand their capacity for conducting basic, translational and clinical research. It provides grants to institutions that award doctoral degrees in health-related fields and have student populations that are 50 percent or greater African American, Hispanic, American Indian, Alaska Native or Pacific Islander.

Science Education Partnership Award (SEPA): The two major goals of this program are 1) to increase the pipeline of future scientists and clinicians, especially from minority, underserved and rural kindergarten to grade 12 students, and 2) to engage and educate the general public on the health-related advances made possible by NIH-funded research.



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