

National Center for Research Resources

Clinical and Translational Science Awards: Accelerating Bench-to-Bedside Research to Improve Health

“You need to take your kid to a pediatric neurologist.” Few words are more terrifying to a parent, yet thousands must face, every day, diagnoses ranging from life-threatening brain tumors to the life-altering Tourette syndrome (TS).

Changing heart-stopping terror to heart-lifting hope for people of all ages facing health issues lies at the core of the Clinical and Translational Science Award (CTSA) program. Administered by the National Center for Research Resources (NCRR), part of the National Institutes of Health (NIH), the CTSA program is designed to transform how biomedical research is conducted and currently supports a national consortium of 55 medical research institutions.

“Our aim is to transform laboratory discov-

eries into better preventions, treatments and cures as quickly as possible,” says Barbara Alving, M.D., NCRR director.

CTSAs Support Leading-Edge Research and Collaborations

For families coping with TS — a chronic neurological disorder characterized by motor and vocal tics — there is now new hope thanks to the work of CTSA-funded researchers at the Yale Schools of Nursing and Medicine. In a study also funded in part by the NIH’s National Institute of Mental Health, researchers have developed a behavioral intervention approach to reduce chronic tics in children and adolescents with TS.

The study results, published in the May 19 issue of the *Journal of the American Medical Association*, found that 52.5

percent of the children receiving a behavioral intervention developed at Yale showed improvement. Further, the degree of improvement with the behavior intervention — which taught the kids how to recognize emotional triggers — was similar to that found in recent anti-tic medication studies.

Until now, the only treatment available for TS, which is found in six children per 1,000 according to the Yale researchers, is antipsychotic medications, which often have side effects that limit usefulness in children.

Just as important, the study investigators said, is that this treatment expands the range of clinicians who can treat TS because medication is no longer the only option.

“Our study is just one example of how the CTSAs are helping to advance research in many disease areas and conditions,” says Larry Scahill, Ph.D., CTSA principal investigator. “By encouraging collaboration across disciplines, CTSAs help spark innovative approaches to tackle research challenges.”

CTSAs Enhance Infrastructure and Science Advances

At the Northwestern University in Chicago, a 2008 CTSA recipient, faculty



The foot of the common mussel (*Mytilus edulis*) produces sticky proteins that allow the organism to glue itself onto rocks, keeping it from being tossed around by waves. Researchers at Northwestern University in Chicago are developing synthetic materials with properties similar to these mussel proteins for a variety of medical applications.

and staff are using the CTSA support to improve collaboration in a variety of ways. One of the most successful programs, says Phillip Greenland, Ph.D., director of the Northwestern University Clinical and Translational Sciences Institute (NUCATS), is the university's recent investment in biomedical informatics. As part of this infrastructure, an Enterprise Data Warehouse (EDW) enables researchers to mine all the data that is available about patient outcomes from Northwestern Memorial Hospital and other affiliated networks.

"Since we received the CTSA in 2008, we've invested a fair amount in biomedical informatics," Greenland says. "We recognize that the future of clinical research is very heavily dependent on the availability of electronic data and storage and the ability to share that information across the research community in a safe and highly secure environment."

Giving scientists access to patient information opens up whole new worlds of possibilities as researchers can use real-world data for outcome and comparative effectiveness research.

Greenland cites as an example a Northwestern neurologist who used the EDW to question the protocol of prescribing anti-seizure medication to stroke survivors to prevent seizures. He discovered, based on the real-world data, that patients on the medications did not have better outcomes, and in fact, they did worse.

NUCATS also provided pilot funding for

www.betterworldproject.net

Phillip Messersmith and his colleagues to develop synthetic materials that mimic proteins produced by sea mussels and can stick to different surfaces even in wet environments. Messersmith has been testing these mussel-based "glues" to seal tears in amniotic sacs, a complication of some pregnancies.

CTSAs Foster Public-Private Partnerships to Accelerate New Health Options

The theme of collaboration is also strong at the University of Pennsylvania (Penn), which received a CTSA in 2006. There, the Office of Corporate Alliances (OCA) — the first of its kind for a medical school — is forging industry partnerships as part of its objective to help move medical advances more quickly to the marketplace.

According to Terry Fadem, OCA managing director, having the relationships in place *before* an innovation needs support, financial or otherwise, means it can move much more quickly through the pipeline process. He cites Penn's School of Medicine's long-standing relationship with Pfizer Inc., one of the world's largest research-based pharmaceutical companies, as an example of how public-private partnerships can be a win-win.

Since 1985, Pfizer has sponsored more than 130 clinical studies at Penn across 10 therapeutic areas, including oncology, psychiatry and infectious diseases. In addition to the financial support, the relationship with Pfizer gives Penn researchers something even more valuable: time, or rather, a decreased amount of it.

"Established industry-public alliances reduce the time it takes to move an idea forward," Fadem says.

"Because Penn physicians are already familiar with Pfizer scientists, we talk to each other, making it easy to quickly evaluate a proposal," he continues. "That means we can remove some time delays from the process. For example, about a year ago, we evaluated a proposal about a cancer drug and from there, we were able to initiate trials in 21 different sites within months. It was launched in January and fully enrolled in May."

Based on the success of initiatives such as the public-private partnerships, Fadem says, "The CTSA program has been immensely positive."

Another example of a successful partnership is The Scripps Translational Science Institute, a CTSA consortium member near San Diego, which partnered with wireless telecommunications company Qualcomm to launch the world's first physician-scholar training program on wireless and mobile health care research in 2009.

"Within the CTSA consortium, Scripps is positioned to become an invaluable resource for this emerging, high-impact field of research," Alving says.

CTSAs Engage Communities in Clinical Research

Meanwhile, the University of Pittsburgh (Pitt) is leveraging its CTSA, also received in 2006, in a variety of collaborative ways as well. Margaret C. McDonald, Ph.D.,

About the Clinical and Translational Science Awards

Led by the National Institutes of Health's National Center for Research Resources, the Clinical and Translational Science Awards (CTSA) program was launched in 2006 to accelerate research from laboratory discoveries to improved patient care. For more information, visit www.ncrr.nih.gov/ctsa.

assistant professor of epidemiology and associate vice chancellor for academic affairs, health sciences, Pitt, reports that its Clinical and Translational Science Institute (CTSI) has supported 1,500 investigators from more than 75 disciplines in 12 different schools.

"We've tracked that work and so far we've seen more than 46,000 citations in peer-

reviewed journals from 2007 through April 2010," McDonald says. "That's a significant contribution to the knowledge base."

Other ways that Pitt's CTSI is collaborating and making a difference is through its community outreach efforts. Whether it is using a mobile lab to reach more than 5,000 middle and high school students or renting a booth at a local Race for the Cure event, McDonald says the CTSA has supported the CTSI's efforts to reach the community on a grass-roots level. The results are paying off there too.

"Our community outreach efforts have produced more than 130 programs about health-related issues that were attended by 285,000 people," she continues. "We want to engage the communities as real partners and work with them in their own neighborhoods."

Yet another way the CTSI is reaching out to the community is by starting a research registry — which has acquired 14,000 members since its inception in 2008 — that matches volunteers with researchers and educates the public about the importance of participating in studies.

CTSAs Help Train a New Generation of Clinical and Translational Researchers

As mandated for all CTSA institutions, the Pitt CTSI also fostered the growth of a new "academic home" in clinical and translational science for the university, facilitating cross-pollination between different areas of study.

"Pitt's secondary appointment program has been approved for 162 faculty members from 46 disciplines in 10 different schools," McDonald explains. "We've always been a pretty interdisciplinary institution, but the CTSA funding has enabled us to bring in even more investigators."

Pitt, like many of the others in the CTSA consortium, also has established a doctoral program in clinical and translational science, for which it encourages health care research diversity aimed at building the cadre of underrepresented populations in that field.

In all, the aim is to accelerate bench-to-bedside research across many disease areas and conditions, in unprecedented ways, to improve health.

— Lisa Richter



In 2009, the University of Pittsburgh's Clinical and Translational Science Institute unveiled a new mobile science lab that includes 26 workstations and sits inside a 70-foot tractor-trailer. The result of collaboration between two NCRR-funded programs — a Clinical and Translational Science Award and a Science Education Partnership Award — the new lab will provide precollege students in western Pennsylvania with hands-on opportunities to learn about the latest science research while using state-of-the-art lab technology.