



▶ Play video
Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"Our grant application was strengthened by the fact that skills and expertise from all five campuses are being harnessed in this effort."

Jack M. Wilson,
president, University of Massachusetts



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



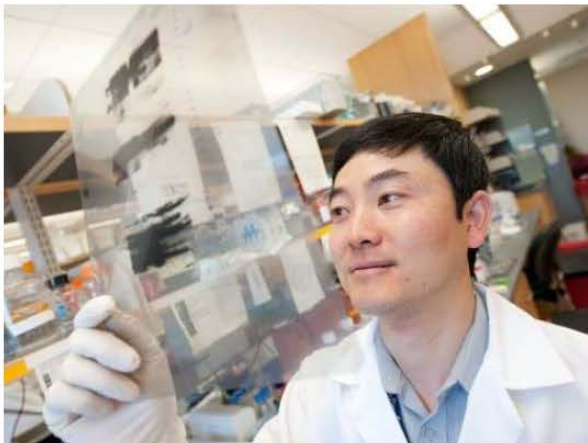
The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be...

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"This grant will re-invigorate the faculty and staff to greater heights of learning, teaching and research."

Professor Robert Goldberg, PhD



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMMS reflect on what the CTSA award will mean for the institution and the community.

**"I want to thank the
NIH for its confidence and
investment in the
University of Massachusetts."**

Governor Deval Patrick



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



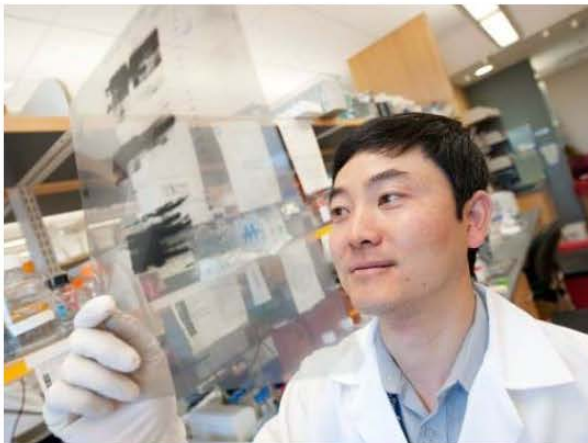
The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMMS reflect on what the CTSA award will mean for the institution and the community.

"This grant puts UMass firmly at the forefront of clinical and translational research."

Catarina Kiefe, MD, PhD,
chair, Department of Quantitative Health Sciences



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMMS reflect on what the CTSA award will mean for the institution and the community.

"The life sciences moment is indeed here."

Chancellor Michael F. Collins, MD



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"This confirms that
UMass has 'the right stuff'
to improve quality of life
for all people."

Ralph Zottola, PhD,
ACIO, Academic & Research Computing Services



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on evidence, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"This demonstrates the Medical School's substantial promise for the future."

Luanne Thorndyke, MD,
vice provost for faculty affairs



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be...

- [Make a gift](#)
- [Send us your feedback](#)





Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"This is a great opportunity for our faculty and doctoral students to collaborate in science initiatives to benefit the patients we serve."

Paulette Seymour-Route, PhD, RN,
dean of the Graduate School of Nursing



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on experience, collaboration will be...

- Make a gift
- Send us your feedback





Leaders from across UMass reflect on what the CTSA award will mean for the institution and the community.

"The CTSA will bring our world-class research and world-class clinical care even closer together."

John O'Brien,
president and CEO of UMass Memorial Health Care



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA

- [Make a gift](#)
- [Send us your feedback](#)





▶ Play video
Leaders from across UMMS reflect on what the CTSA award will mean for the institution and the community.

"The CTSA award reaffirms something that those of us in Central Massachusetts have known for a long time—UMass Medical School is one of the finest institutions in the country."

U.S. Rep. Jim McGovern



Resource Links

[University of Massachusetts Center for Clinical and Translational Science](#)
[National Center for Research Resources, Clinical and Translational Science Awards](#)
[CTSA Fact Sheet](#)
[Press release: CTSA grant to advance lab discoveries into clinical treatment](#)

Story Coverage



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application



Officials congratulate UMass on winning grant



After the excitement of discovery, clinical trials bring science to the community



New integrated research database helps researchers quickly test hypotheses



The UMass Medical School community reacts to news of CTSA



Based on evidence, collaboration will be

- [Make a gift](#)
- [Send us your feedback](#)





After the excitement of discovery, clinical trials bring science to the community

[<< Back](#)

It's a long way from the scientist's "eureka" moment to the physician's prescription pad, and necessarily so. Every biomedical development brought to bear on human health must first progress through rigorous and heavily regulated clinical trials—meeting standards of safety, demonstrating efficacy and proving therapeutic benefit—before making its way into use. Clinical trials, which to patients can sometimes seem frustratingly long and slow, are critical to the bench-to-bedside process; without them, untested new medications and procedures could potentially cause great harm in patients.

Being selected by the National Institutes of Health for a \$20 million Clinical and Translational Science Award means UMass Medical School joins an elite consortium of 55 institutions charged with accelerating the pace of clinical research and more quickly bringing safe and effective therapeutics to patients. UMMS has been laying the groundwork for increasing the size and scope of its clinical research enterprise through infrastructure enhancements, collaboration with clinical partner UMass Memorial Health Care and a new Clinical Research Center (CRC), all of which position the institution for quick action.

With UMass Memorial, UMMS faculty already enroll patients in 800 to 900 open human studies each year; of those, about 250 to 300 are intervention trials measuring the therapeutic effect of a medical procedure or pharmaceutical. Other types of trials underway include medical device testing (often comparing a standard device to one that has been altered or enhanced), observational studies or healthy volunteer studies. Many of the intervention trials conducted by UMass principal investigators are externally sponsored multisite trials—with UMMS contributing patient data and documentation but not analyzing the data or drawing conclusions—but faculty are increasingly designing, conducting and analyzing their own trials.



Research nurse coordinator Carol Ciccarelli, RN, prepares Peter Lavalley of Northbridge for a clinical trial of an infusion drug for diabetes.

The CTSA gives UMMS the resources to do more—and more complicated—trials in the hospital setting, such as a comparison study of surgical devices or a 12-hour infusion study in which the dosage of a new chemotherapy agent is being tested. "Any new device or medication carries with it some risk," said Sheila B. Noone, PhD, assistant vice provost for clinical research, who has been involved in the Medical School's methodical efforts to build its clinical trials capabilities and win the five-year CTSA grant. "In some cases, a hospital setting provides peace of mind and additional 'just-in-case' safeguards. We're fortunate to have an excellent tertiary care center as our clinical partner."

Strategic plans call for doubling the capacity of the current Clinical Trials Unit (CTU), an outpatient center located on the seventh floor of the Medical School building where specially trained research nurse coordinators manage the hands-on needs of clinical trials, such as collecting blood samples or delivering medications and providing careful and consistent documentation for PIs. In addition to the CTU, the new CRC on the first floor of the soon-to-be-opened Ambulatory Care Center (ACC) will have six exam rooms and three infusion bays in which to conduct studies, as well as additional research nurse coordinators and other staff.

To some degree, the growth of the institution's clinical trials portfolio will hinge on the community. Clinical trials require the availability of a large pool of everyday people and patients willing to take part in clinical research and clinical trials as volunteer study participants. Many clinical studies recruit patients who suffer from the disorder being studied, but there is an increasing need for healthy people in phase 1 trials.

"When you stop and think about it, every patient who benefits from a medication or a diagnostic test or a minimally invasive procedure owes a debt of gratitude to the participants of the clinical trials that made that medication or test or procedure possible," said Dr. Noone, who is preparing to build a communication campaign to engage the community and raise public awareness about what participation in a clinical trial entails. Toward that end, the front door of community access to clinical trials will be the new Clinical Research Center soon to open on the first-floor of the ACC, adjacent to the lobby. There, patients and visitors alike can obtain information about open trials and current recruitment needs.

Concurrent with public outreach efforts are internal efforts to pilot an electronic system tying together numerous components of the clinical research arm—from the Institutional Review Board to the Human Subjects Committee to the Institutional Animal Care and Use Committee, along with grants and contracts—allowing real-time tracking of study status, from grant proposal through patient recruitment to publication.

In addition, the Medical School has also been laying the groundwork for accreditation as a Human Research Protection Program (HRPP)—the gold standard, Noone said, for clinical studies programs. "It's a rigorous review of the systems we have in place—protocols, policies, cross checks and safeguards—for conducting studies that are as efficient, safe and ethical as possible," said Noone. "It raises the bar and says a lot about the organization's commitment to its study volunteers. We owe it to our volunteers for all they do to help us advance medical care."



Ambitious clinical trial test program to prevent diabetes among Latinos in Lawrence

[<< Back](#)

*Many clinical trials at UMass Medical School have a community impact. This trial, featured in the UMMS magazine *Vitae*, introduces weight control, nutrition and exercise programs to a population at high risk for developing diabetes, with implications for all.*

Elliot Joslin, founder of the famed diabetes clinic that bears his name, said nearly 100 years ago that with diabetes, genetics loads the cannon, but obesity pulls the trigger. Today, among the Latino population of the United States, the cannons of diabetes are booming.

To address the soaring incidence of diabetes among Latinos, both in the commonwealth and across the country, UMass Medical School and the Greater Lawrence Family Health Center (GLFHC) have embarked on an ambitious clinical trial to test a program that researchers hope will prevent the onset of type 2 diabetes among members of the Latino population in Lawrence, Massachusetts. And if the trial succeeds there, it could point the way to a cost-effective approach for preventing type 2 diabetes in all populations.



Ira S. Ockene, MD

"If we show that we can prevent diabetes among Latinos in Lawrence, then I would hope third-party payers would start covering this kind of intervention for anyone who needs it," said Ira S. Ockene, MD, principal investigator of the clinical trial and the *David J. and Barbara D. Milliken Professor of Preventive Cardiology* and professor of medicine at UMMS. "Right now third-party payers are willing to pay \$50,000 to have stents placed in your heart when you are sick, but they're not willing to pay \$1,000 for the counseling that might prevent you from becoming sick. That's unfortunate, and I hope if our study is successful, that will change."

Dr. Ockene's reference to heart disease in the context of a diabetes prevention program is hardly casual. The consequences of diabetes left unchecked are severe, including heart disease, stroke, blindness and kidney failure. "Diabetes is an extraordinary risk factor for heart disease," Ockene said. "The major cause of death among diabetics is heart disease. So as a cardiologist, I have every reason to be interested in diabetes, just as I have every reason to be interested in smoking, high blood pressure and cholesterol."

Conversely, diabetes can be managed with great success. Well understood measures, such as weight control, proper nutrition and increased physical activity can help most diabetics avoid the severe complications of the disease. So Ockene and his colleagues will attempt to translate that body of knowledge to help people who do not yet have diabetes remain free of the disease. "Based on all the studies we have done previously on how you get people to change their nutrition and physical activity, we believe we can develop an intervention that will be simple and workable in the real world—even in a very challenging environment like the one in Lawrence," said Ockene.

John P. Mordes, MD, professor of medicine, a diabetes researcher and clinician at UMMS, worked as a consultant with Ockene to craft the clinical trial. "I see many Latinos in my clinic, so I know first-hand the magnitude of this problem," Dr. Mordes said. "The goal of intervening before diabetes is present is, by far, preferable to providing care for someone who already has the disease. So it was a privilege for me to be asked by Dr. Ockene to be involved in the design of this trial."

The effort is called the Lawrence Latino Diabetes Prevention Project (LLDPP), a four-year, \$2.6 million randomized clinical trial funded by the National Institute of Diabetes and Digestive and Kidney Diseases at the National Institutes of Health (NIH). The study brings together an array of community groups including the Lawrence Council on Aging/Senior Center, which will be the host site for much of the programming; the YWCA of Greater Lawrence, which will help with recruitment and advise on community issues; UMass Lowell, which will analyze the blood samples from participants in the study; and the clinical and research resources of UMass Medical School and the GLFHC.

"This is an excellent partnership between the academic researchers and the community," said Trinidad Tellez, MD, a clinician-researcher at the GLFHC, and assistant professor of family medicine & community health at UMMS. Dr. Tellez is a co-principal investigator of the prevention study. She's also a member of the Executive Advisory Committee for the Massachusetts Diabetes Prevention and Control Program, which is working on a statewide diabetes action plan. "The burden of diabetes in Lawrence is high and there are a lot of challenges delivering this intervention," Tellez said. "We believe that if we can prevent diabetes here, anybody should be able to do it anywhere."

According to the American Diabetes Association (ADA), some 18 million Americans now have type 2 diabetes (often called adult onset diabetes, though the spike in obesity among children is driving a similar increase in diabetes among young people). More troubling is the rate of increase in the prevalence of the disease. According to federal statistics, the number of people diagnosed with type 2 diabetes jumped nearly 30 percent between 1997 and 2002.

While type 2 diabetes affects all segments of the population, it hits certain groups harder. Latinos, Asians, African Americans and Native Americans are genetically more susceptible to diabetes, and that predisposition is enhanced by environmental or behavioral factors such as poverty and obesity that can hasten onset of the disease.

The result: these minority groups suffer from diabetes at two to three times the rate of the majority population in the United States. In Massachusetts, the prevalence of type 2 diabetes among Latinos is 8.4 percent, compared to 4.7 percent for the Caucasian population.

In Lawrence, one of the poorest communities in the commonwealth, the problem is even worse, with the prevalence rate now pegged at 11.8 percent for Latinos of Puerto Rican and Dominican origin. "There's a confluence of factors here that add up to diabetes being much worse for Latinos in Lawrence," Tellez said.

As it tracked the soaring incidence of type 2 diabetes in Lawrence, the GLFHC began working several years ago to help patients better manage their diabetes. Funded by a REACH 2010 grant from the U.S. Centers for Disease Control and Prevention, the health center developed educational and clinical protocols aimed at diabetic Latinos. Under the leadership of Dean Cleghorn, EdD, associate professor of family medicine & community health and a director of one of the GLFHC clinics, the REACH program has built an infrastructure of diabetes education and care within the health center. A cornerstone of that effort is the Diabetes Self-Management Education Program that was recently awarded "Education Recognition" from the ADA. "REACH is very important and very successful," said Tellez, who also works on the REACH project. "We know it helps people who have diabetes. Now we're trying to expand our scope and help the 42,000 Latinos in Lawrence."

research project. "We know it helps people who have diabetes, now we're trying to expand our scope and help the 42,000 Latinos in Lawrence, who don't have the disease, but who are at risk for developing diabetes."

The Lawrence study will enroll a total of 400 Latinos who fall into this category. The participants will be split into two groups of 200 each, with one group (the control group) being given the usual care for non-diabetics now practiced in the Lawrence area.

The other group (the intervention group) will participate in a 23-month-long series of programs designed by the research team to help reduce the risk of developing diabetes—primarily through weight loss and increased physical activity. Both groups will be followed for a year after the intervention classes end.

The preventive programs for the group will include cooking classes, exercise classes, strategies for food shopping and eating out at restaurants. There will be educational sessions about diabetes, the risk factors that lead to diabetes, and the consequences of the disease if left unchecked. The program will also include several psychosocial elements to help people deal with issues such as self-efficacy and depression that play a pivotal role in a person's ability to change behaviors. "Long-term adherence is the key to the success of this program," said Milagros C. Rosal, PhD, associate professor of medicine at UMMS and co-principal investigator of the study. "When you want people to change, you have to make the changes easy and appealing, otherwise they won't adhere to them long-term. So we will try to build skills in situations that resemble their day-to-day activity."

Dr. Rosal works in the UMMS Division of Preventive and Behavioral Medicine. In the Lawrence study, Rosal will lead the effort to develop the programs that will convey the educational information on diabetes prevention to the intervention group. She will also develop practical literacy- and culturally sensitive strategies to facilitate attitudinal and behavioral change. "The Lawrence population presents multiple challenges, including language, culture and literacy level," Rosal said. "We'll need to use very little printed material, and we're planning to deliver the entire intervention in Spanish."

In that effort, Rosal will draw on insights she's gleaned from several years of work studying factors that facilitate or inhibit diabetes self-management among low-literate Latinos. That population typically suffers higher complication rates and higher death rates from diabetes as compared to Caucasians, Rosal said.

"Interestingly, we found that the problem was not access to health care; nearly everyone in the groups we studied had access to health care and was seeing their doctor several times a year. So the key issue, I believe, is that patients may not be receiving the information they need about diabetes in ways they could process and integrate into their daily lives."

Rosal is now working closely with clinicians, nutritionists and counselors from UMMS and the GLFHC to finalize the methods and materials to be used in the Lawrence clinical trial. Plans call for a variety of group sessions, individual sessions, and follow-up phone calls to participants' homes. Recruitment for the study will begin this fall, and the first intervention classes are scheduled for January 2005.

Throughout the study, researchers will track participants' weight, body/mass index, blood pressure, cholesterol and blood glucose levels. That data will be used in a well-established formula that can predict a person's chance of developing diabetes within seven years, based on their metabolic profile. The test of the Lawrence study will be to see if the intervention group significantly reduces its risk of diabetes, compared to the control group. "Years ago when we studied cholesterol and heart attacks, we had to track people and prove we reduced the incidence of heart attacks in the group. We don't do that anymore because the linkage is a given—now we just focus on reducing cholesterol, knowing that will reduce heart attacks," Ockene said. "The same is true with diabetes. We don't have to follow the people in this study for 10 years to see what will happen. Our goal is to gain the knowledge that if we reduce these risk factors, the incidence of diabetes will be reduced."

[about UMMS](#) | [office of communications](#) | [administration](#) | [directions](#) | [UMass system](#) | [index](#) | [intranet](#) | [directory](#) | [contact us](#)

This is an official Page of the UMass Chan Medical School

Office of Communications • 55 Lake Avenue North Worcester, Massachusetts 01655

Questions or Comments? Email: UMMSCommunications@umassmed.edu Phone: 508-856-2000

[Privacy Statement](#)

[Back To Top ▲](#)



Based on experience, collaboration will be enhanced with CTSA

[<< Back](#)

Quantitative Health Sciences Chair Catarina I. Kiefe, MD, PhD, is familiar with how a major grant like the CTSA can impact an institution and its research capabilities: she was a co-principal investigator on a successful CTSA application when she was at the University of Alabama-Birmingham (UAB) prior to her appointment as chair and professor of quantitative health sciences and professor of medicine at UMMS. "The immediate, major impact was that everyone had to be much more interdisciplinary," said Dr. Kiefe. "The whole point of the program is to provide opportunities for faculty to work together across department and program lines. In the interest of science, teams were compelled to work in an interdisciplinary way."

A key to understanding the CTSA and its impact is this focus on research infrastructure in support of collaboration, especially among basic science and clinical science investigators. By creating an academic home for all translational research activities, UMMS plans to accelerate early phase translational research studies to reduce the time it takes for laboratory discoveries to become treatments for patients; to engage communities in clinical research efforts; and to train a new generation of clinical researchers.

"This award is especially important to our efforts in community engagement and in education across the university," said Kiefe. "At UAB, for example, we were able to form real and substantive partnerships with the community at large, and we informed and led many research initiatives. Here at UMMS, we will hear from the community about their ideas and priorities, which will influence how we design and create research that has a community impact." Ira Ockene, MD, the *David and Barbara Milliken Professor of Preventive Cardiology* and professor of medicine, heads the community engagement core of the UMMS CTSA, which will help create community research partnerships to improve population health and well-being.



Quantitative Health Sciences Chair Catarina I. Kiefe, MD, PhD

In areas across the research spectrum at UMMS, the CTSA impact is already apparent—the creation of clinical data warehouses, the new biorepository and the strategically redesigned Clinical Research Center all speak to the change in resources, infrastructure and organization coming to the institution. "By becoming part of this national research consortium, UMMS will be part of a very powerful vehicle for developing research resources and taking new ideas to tangible results," said Kiefe. "This grant is both a validation of our capacity for translational research and an incentive for us to take our work to the next level."



Biorepository Core banks clinical information for biomedical research



Leading the Conquering Diseases Biorepository Core are, from left: Thomas Mayer, PhD, director of the biorepository laboratory; Craig M. Lilly, MD, program director; and Joanne Meisner, project manager.

The UMass Medical School Conquering Diseases Biorepository Core, a new resource for banking blood samples for biomedical research, will soon make available a substantial amount of anonymous clinical information for use in biomedical research. Although the Biorepository Core is still building its inventory of samples, it is poised to quickly expand and capture information that will further the understanding of the disease process.

The Biorepository Core is a collaborative effort led by Craig Lilly, MD, professor of medicine, anesthesiology and surgery and director of the UMass Memorial eICU program; Ralph Zottola, PhD, instructor in biochemistry & molecular pharmacology and associate chief information officer of Academic & Research Computing Services; Gary Schneider, PhD, professor of molecular medicine and associate vice provost for research administration; and Paul Ranauro, senior application database developer; and overseen by the UMMS Institutional Review Board. It will store plasma, DNA and RNA and will provide researchers with a pool of de-identified samples to work with.

While many biorepositories bank DNA and protein products, few bank RNA. Given the Medical School's strength in RNA research, the Biorepository Core will seek to meet the research needs by isolating both high molecular weight DNA and total RNA (including small RNA and microRNA). Additionally—and equally important—researchers will be able to obtain de-identified information about patients' age, gender, diagnoses and medications at the time of the sample draw, allowing for comparison of one sample to the next.

"To conquer common diseases, we need to identify the factors responsible for differences in how they manifest and respond to treatment," said Dr. Lilly, director of the Biorepository Core. "In partnership with health care providers at UMass Memorial, we are documenting how diseases present and respond to treatment every day. The biorepository is about using this information to not only understand what those variations are and why, but also, eventually, to better guide patient care for the best outcomes."

As of September 2009, researchers are able to search two million records—completely de-identified to protect patient privacy—that include 122 million clinical facts.

Originally published in the UMMS in-house newsletter Focus.



Early intervention shows hope for of cystic fibrosis patients

[<< Back](#)

Dr. Brian O'Sullivan leads a multisite clinical trial that may help delay the onset of cystic fibrosis symptoms and perhaps lessening their severity.

Every day in maternity wards throughout New England, a simple drop of blood is taken from the heels of newborns to be tested for a host of metabolic disorders that, if left undetected and untreated, could cause irreversible brain damage, lifelong disability or death. Such testing, conducted daily for some 500 infants born in the region by the UMass Medical School New England Newborn Screening Program, provides a clear benefit: early detection and the opportunity to prevent the ramifications of the disease altogether.

The picture for prevention is not quite so clear for cystic fibrosis (CF), a chronic and ultimately fatal genetic disorder, usually diagnosed before age three, that results in the production of abnormally thick mucus in the lungs and pancreas and affects more than 30,000 young people nationwide. In 1999, the UMMS Newborn Screening Program piloted an optional test for CF and today, 99 percent of parents opt for the test. Yet, even though CF can be detected before symptoms appear, there is still no cure and no preventive measures to offer patients.

There is a glimmer of hope, however, regarding the symptoms of CF. Brian O'Sullivan, MD, UMMS associate professor of pediatrics, and other researchers this year identified in CF patients an imbalance in two particular fatty acids, arachidonic acid (AA) and docosahexaenoic acid (DHA). This discovery, viewed against previous animal studies, has served as the impetus for a clinical trial that may provide important clues to staving off the onset of symptoms and perhaps lessening their severity.

The fatty acid study, published in the February 5, 2004, issue of the New England Journal of Medicine (NEJM) by Dr. O'Sullivan and lead author Steve Freedman, MD, of Beth Israel Deaconess Medical Center, found that CF patients had abnormal levels of AA, which is associated with causing inflammation, and DHA, which is known to suppress inflammation. The study helped answer questions raised by Dr. Freedman's earlier work showing that genetically altered mice with CF had low levels of DHA and high levels of AA, an imbalance that resulted in uncontrolled and excessive inflammation. Additional studies indicated that higher levels of DHA in the diet could help restore the balance and mitigate effects of the disease in mice. It wasn't yet clear, however, whether the fatty acid imbalance was present in humans with CF and, if so, whether it was a cause or result of the inflammation seen in CF.

The NEJM study included as control groups individuals with asthma, upper respiratory infections or inflammatory bowel disease, and parents of CF patients. By comparing the fatty acid levels and inflammatory responses in the groups,

"We found that individuals who carry one copy of the CF gene but are disease-free [the parents] have levels of AA and DHA midway between normal controls and CF patients," said O'Sullivan, results indicating that the fatty acid defect is a basic problem of CF, not a reflection of the disease state.

O'Sullivan and Freedman collaborated on the landmark study after being introduced to each other by Eliza Parker, MD '01, who had worked in the Freedman lab prior to studying at UMMS. It was Dr. Parker who provided the method by which DHA could be introduced to patients selected for the clinical trial soon to get underway.

Parker, now a second-year pediatrics resident at New York's Weill Cornell Medical Center, had expressed an interest in conducting a CF-related project between her first and second years of medical school. She knew that Freedman had seen differences in CF mice fed DHA—she also knew that mouse and human breast milk contain DHA. For her study, Parker decided to seek a link between breastfeeding and the onset of symptoms of CF in humans.

"I remembered that CF mice did well until they were weaned from breastfeeding, and then the disease kicked in," said Parker. Though it wasn't clear whether the disease progression was tied to weaning or a coincidence of age, she thought, "Why wouldn't this be the same in humans? And wouldn't that be an easy way to potentially have an effect on the disease's progression?"

With O'Sullivan and Freedman, Parker created a questionnaire regarding breastfeeding practices and distributed it through CF centers across the country, generating some 800 responses from parents of CF children of all ages—infants, teens, young adults. The researchers found that there was a statistically significant decrease in the need for intravenous antibiotics—a common therapy for CF lung infection—in those children who had been exclusively breastfed for six months or more. Another Two-year-old finding, although not of statistical significance, indicated that the infants who were breastfed also experienced onset of CF symptoms at a slightly later age. The results of the questionnaire study were published in the April 2004 issue of Pediatric Pulmonology, with Eliza Parker as the lead author.

"It was those three pieces of the puzzle—knowing that DHA made a difference in mice; knowing that humans had the same defects; and having a hint through Eliza's Pediatric Pulmonology paper that breastfeeding is beneficial for infants with CF—that led us to think that feeding early in life with DHA-supplemented formula might be helpful," said O'Sullivan.

O'Sullivan is now leading a multisite study of the effect of DHA-supplemented formula on the disease progression in CF infants identified through newborn screening and whose parents have chosen not to breastfeed. Traditionally, infant formulas available in the United States have not contained any DHA, although some manufacturers have added small amounts of the fatty acid to their formulas to capitalize on its purported benefit for neurologic development, an advantage that remains unproven. The formula O'Sullivan is using, provided by Mead Johnson Nutritionals, contains three times as much DHA as the company's commercially available fortified formula, and a higher concentration than is found in the breast milk of the average American mother.

O'Sullivan's study is funded by the Cystic Fibrosis Foundation and Mead Johnson, the manufacturer that is providing the study formula for free—"no small cost," according to O'Sullivan. He expects to enroll 80 to 100 infants at 16 to 20 sites: there are currently five sites in Massachusetts and 11 in New York, two of the nine states that already screen for CF at birth. Other states may join the study as well. (Approximately 35 cases of CF are detected annually among the Commonwealth's infants; New York sees nearly 50. Nationwide, about 1,000 cases of CF are identified annually, either through newborn screening or clinical diagnosis.) Infants will be monitored for 12 months, from identification via newborn screening through their first birthdays.

Although lung disease causes death in 90 percent of CF patients, in the first year of life few patients have dramatic respiratory problems while most do experience pancreatic symptoms. Prior to the advent of newborn testing, the majority of CF diagnoses were made based on a child's failure to thrive (poor growth), a result of pancreatic insufficiency and improper digestion of food. Because pancreatic damage occurs earliest, the study will rely on monthly stool samples to monitor human fecal elastase (FE-1) levels, a measure of pancreatic function that indicates the degree of inflammation and destruction in the pancreas. "What we're hoping to see is preservation of pancreatic function and higher FE-1 levels in the group getting DHA, a sign of less inflammation and destruction of the pancreas," said O'Sullivan. "If we see even a small difference now, we'd want to follow it to see if the difference is maintained or lost over time."

O'Sullivan would like to obtain funding to follow the same cohort of children to age 5, 6 or 7, when they're old enough to participate in pulmonary function tests to detect any long-term benefit of intervention with the DHA-supplemented formula. "With good care and nutritional support, and aggressive antibiotic therapy for minor respiratory illnesses, a lot of kids don't develop problematic lung disease until they're into high school and beyond," said O'Sullivan. "We have some kids who are track or basketball stars; activities that weren't dreamed of 25 years ago."

In fact, the life expectancy for children with CF has increased dramatically over the years. When O'Sullivan graduated medical school in 1980 and began doing CF research, life expectancy was about 25 years; today is it up to 33 years. But if 33 years seems an improvement, early intervention to make more of those years disease-free would be even better. (O'Sullivan admits he is unsure about newborn screening for CF, and remains concerned about the ethical and moral conundrum raised when parents are provided with a diagnosis of a disease they can't avoid.) If the infant formula study provides further evidence that early intervention with DHA can help delay the onset of CF, even by a few years, O'Sullivan's concerns will be allayed.

"Until now, the answer to the question 'can we offer something to parents of children with CF?' has been no—this study may give us a yes," he said. "If this does turn out to be a yes, then there's a very strong argument indeed for nationwide, mandatory newborn screening for cystic fibrosis."

[about UMMS](#) | [office of communications](#) | [administration](#) | [directions](#) | [UMass system](#) | [index](#) | [intranet](#) | [directory](#) | [contact us](#)

This is an official Page of the UMass Chan Medical School

Office of Communications • 55 Lake Avenue North Worcester, Massachusetts 01655

Questions or Comments? Email: UMMSCommunications@umassmed.edu Phone: 508-856-2000

[Privacy Statement](#)

[Back To Top ▲](#)



Grant vaults UMass Medical School into elite consortium moving lab discoveries into clinical treatment

[<< Back](#)

UMass Medical School has been awarded a prestigious \$20 million grant that has the power to transform the institution, the community and the region. Funded by the National Institutes of Health (NIH), the Clinical and Translational Science Award (CTSA) places UMMS among an elite consortium of 55 nationally prominent research institutions that is working to move laboratory discoveries into treatments for patients, engage communities in clinical research and train a new generation researchers.

Launched in 2006, the CTSA program—led by the National Center for Research Resources (NCRR) of the NIH—creates academic homes for clinical and translational science at research institutions across the country. A major goal of the program is to develop teams of investigators from various fields of research who can take scientific discoveries in the laboratory and turn them into treatments and strategies for patients in the clinic. By encouraging collaboration across disciplines, CTSA support innovative approaches to tackle research challenges and train clinical and translational researchers.



John Sullivan, MD, vice provost for research, stands in the under-construction Clinical Research Center in the Ambulatory Care Center, slated to open this summer.

"With this extraordinary grant, the National Institutes of Health has recognized the outstanding research taking place at UMass Medical School and has invested in the promise of future life-saving therapeutics that will result from our research," said UMMS Chancellor Michael F. Collins. "This is an incredibly proud moment for UMass, UMass Medical School, our clinical partner UMass Memorial Health Care and the many individuals and departments throughout the UMass system who contributed to the successful application. It signals the beginning of a new era, one in which UMass is a major player in translational research. The life sciences moment is indeed here."

The UMMS grant will be disbursed in five annual \$4 million installments and will support the recently established University of Massachusetts Center for Clinical and Translational Science (UMCCTS), which serves as the home for clinical and translational scientists and research across all five UMass campuses.



Chancellor Michael F. Collins

The primary goals of the UMCCTS are to:

- accelerate early phase clinical trials by recruiting and supporting clinical research leaders, establishing innovative research support facilities and developing new therapeutics based on UMass discoveries;
- integrate unique networks of clinical research and health care delivery in central New England and throughout Massachusetts to expand later phase clinical trials; and
- build collaboration among the three schools of UMMS and across the five UMass campuses in developing programs, curricula and faculty support systems that foster and promote careers in clinical and translational research.

A number of these goals are already well underway. The establishment in 2008 of the UMMS Department of Quantitative Health Sciences created a home for investigators and core services in biostatistics and study design, epidemiology, and outcomes research and medical informatics. Development of MICARD (Massachusetts Integrated Clinical Academic Research Database) created a warehouse for clinical data on 50 percent of the residents in Central Massachusetts and will house all the data that supports the newly created [Conquering Diseases Biorepository](#), a resource for banking blood samples donated by UMass Memorial Medical Center patients. Academic programs to prepare and support the next generation of clinical and translational researchers have been created or expanded, including a [new master's program in clinical investigation](#) that awarded its first degrees this year; a new clinical research certificate program for established research and health care professionals; and new clinical research pathways for students across the educational spectrum, from kindergarten to medical school.

Key to the grant application's success—and unique to UMMS—are three components of the UMCCTS that are also, not surprisingly, key to the UMMS mission and vision for the future:

- **Advanced Therapeutics Cluster**, which includes the RNA Therapeutics Institute, the Center for Stem Cell Biology and Regenerative Medicine, and the Gene Therapy Center, all of which offer unique opportunities for the discovery of new disease targets and the development of new therapeutic agents for a wide range of human diseases.
- **Commonwealth Medicine**, which fosters partnerships with public sector agencies to translate research evidence into practice and foster policy change that benefits underserved populations. Commonwealth Medicine's resources, infrastructure and strong ties with state governmental agencies provide researchers with a unique and direct link to policymakers. In turn, this creates the potential to have research findings both directly and indirectly impact the development and implementation of programs focused on improving the health of the citizens of Massachusetts.
- **MassBiologics**, the only FDA-licensed biologics production facility owned and operated by a university in the United States, which has generated fully humanized monoclonal antibodies for SARS, rabies and hepatitis C.

"This CTSA catapults UMass Medical School into the upper ranks of research institutions, positioning us alongside institutions like Harvard, Johns Hopkins and UCSF," said John Sullivan, MD, vice provost for research and professor of pediatrics and molecular genetics & microbiology. "The funds will allow us, through our Center for Clinical and Translational Science, to take the fantastic knowledge base here and apply it to clinical applications that have direct impact on human diseases, such as diabetes, Alzheimer's and cancer."

To see leaders from across UMMS reflect on the prestigious award, plus get a sneak peek inside the soon-to-open Ambulatory Care Center

where clinical and translational research will have a permanent home, [view the video here](#).

[about UMMS](#) | [office of communications](#) | [administration](#) | [directions](#) | [UMass system](#) | [index](#) | [intranet](#) | [directory](#) | [contact us](#)

This is an official Page of the UMass Chan Medical School

Office of Communications • 55 Lake Avenue North Worcester, Massachusetts 01655

Questions or Comments? Email: UMMSCommunications@umassmed.edu Phone: 508-856-2000

[Privacy Statement](#)

[Back To Top](#) ▲



New building fosters closer collaboration between clinicians and researchers

[<< Back](#)

UMass Medical School and UMass Memorial Medical Center have created the Clinical Facility for Innovative Research and Education (CFIRE), a center that will combine the basic science innovation that has made the Medical School a biomedical powerhouse with the Medical Center's research potential. CFIRE will be located in the \$120 million Ambulatory Care Center (ACC), a seven-story, 258,000-square-foot facility that is scheduled to open this summer. The center will be linked to a number of clinical programs in the building, including the hospital's Centers of Excellence—Heart and Vascular, Diabetes and Endocrinology, Musculoskeletal and Cancer—providing closer collaboration between clinicians and researchers.



The Ambulatory Care Center (ACC), a seven-story, 258,000-square-foot facility scheduled to open this summer, will house the Clinical Facility for Innovative Research and Education.

"The Medical Center and Medical School are in a position to bring tremendous benefit to our community and the Central New England region through cutting-edge science, state-of-the-art clinical care, and the training of Massachusetts physicians," said Walter H. Ettinger Jr., MD, MBA, president of UMass Memorial Medical Center and associate vice provost for Clinical and Population Health Research at UMMS. "This building will be a unique harmonization of clinical care, research and education on every floor, as one example of how the Medical Center and Medical School are aligning around the Centers of Excellence."

"We have developed a new and unconventional vision of how to move UMass Medical School to the next level of clinical and translational research, and that vision is embodied in this ACC building design," said UMMS Provost & Executive Deputy Chancellor Terence R. Flotte, MD, dean of the School of Medicine. "The essential element is co-localizing clinical care and clinical research in adjacent space on each floor. This allows physician-investigators and patients to move seamlessly from where they receive treatment to where they can participate in trials of investigative therapies. We believe this building and the programmatic design within it will catalyze dramatic advances in the application of stem cell technology and molecular therapy that will reach the patients of Central Massachusetts, New England, the nation and beyond."

The facility is designed to bring together a number of key components necessary to conduct clinical outcomes research and represents a turning point for research efforts at UMMS and UMass Memorial. Over the years, the institutions have recruited world-class innovators in the basic laboratory sciences and have established one of the most respected research institutions in the country. Leaders in the fields of RNA, molecular medicine and gene therapy call UMass home. And now, building on that foundation, a number of brilliant clinician-researchers who share the vision to become a powerhouse in clinical and translational research have joined the institutions as well. "We're going after cardiovascular disease, cancer, ALS, diabetes and more," said Dr. Flotte.

The Medical School and Medical Center have sought to foster long-term collaborative partnerships for clinical and translational research among UMass-based researchers and community partners and has solicited input from community leaders. One result is the location of the Clinical Research Center on the first floor of the ACC building, creating an entry point that will make the facility more welcoming and easier for patients and visitors to navigate.



New degree puts emphasis on turning research breakthroughs into treatment for patients

[<< Back](#)



The Graduate School of Biomedical Sciences graduated its first master's in clinical investigations class this year.

Initiated three years ago as part of the UMass Medical School's effort to translate research breakthroughs in the laboratory to viable treatments for patients in the clinic, the Master of Science in Clinical Investigation (MSCI) program, offered by the Graduate School of Biomedical Sciences, graduated its inaugural class at the 37th Commencement exercises this year.

Open to MD and PhD scientists at UMass Medical School and its clinical partner UMass Memorial Medical Health Care, the program was created to give researchers the tools to fill in knowledge gaps so they can start designing and implementing their own clinical studies. "We're training both physicians and basic scientists to be leaders in clinical and translational research," said MSCI Program Director Robert Goldberg, PhD. "This program gives them the tools to be able to design and pursue their own studies."

Physicians and basic scientists complete the two-year program with a strong foundation in clinical investigation skills, incorporating study design, conduct of observational studies and randomized trials, clinical epidemiology and biostatistics. "Physicians interested in pursuing clinical questions or trends they might see in their patients learn how to identify gaps in the current literature and design a study with the intention of improving a prognosis or functional status," said Dr. Goldberg.

For basic scientists, the MS in clinical investigation offers a chance to realize a clinical application as a result of basic research. One of six graduates from the inaugural class, Christine Clemson, PhD, has spent 15 years at UMMS, first as a doctoral student, then as a researcher in the lab of Jeanne B. Lawrence, PhD, professor of cell biology, working on non-coding RNA. "I was at a point in my career

where I wanted to be part of the clinical application of research," said Dr. Clemson. "I wanted to see that knowledge and understanding applied to the greater good. It happened that as I was looking to make this change, the National Institutes of Health was putting a greater emphasis on translational research."

As part of her master's thesis, Clemson designed a clinical study for Shalesh Kaushal, MD, PhD, chair of ophthalmology and associate professor of ophthalmology and cell biology. "It was an incredible learning experience," said Clemson. "I immersed myself in learning the process of putting together a clinical trial, understanding what patients we'd have to recruit and how many and making sure we had approval from our Institutional Review Board and the Food and Drug Administration."



New genes at work in patients with hereditary lung disease

[<< Back](#)

Gene therapy trial succeeds in spurring production of a protective protein



Terrence R. Flotte, MD, Dean of the School of Medicine, and Provost & Executive Deputy Chancellor

Researchers at the University of Massachusetts Medical School and the University of Florida (UF) in Gainesville have safely given new, functional genes to patients with a hereditary defect that can lead to fatal lung and liver diseases, according to clinical trial findings published online in the August 2009 issue of *Proceedings of the National Academy of Science*.

"This trial represents a very important step toward a potential gene therapy for the 100,000 or more Americans who suffer with alpha-1 antitrypsin deficiency," said Terrence R. Flotte, MD, executive deputy chancellor and provost and dean of the School of Medicine. Dr. Flotte, senior author on "Sustained transgene expression despite T lymphocyte responses in a clinical trial of rAAV1-AAT gene therapy," was formerly the chair of pediatrics at the University of Florida, where the study was conducted.

Patients with alpha-1 antitrypsin deficiency cannot produce a protective form of the protein alpha-1 antitrypsin, which is normally produced in the liver and protects the lungs from inflammation. Those lacking alpha-1 antitrypsin are vulnerable to infections or irritants in the air, such as cigarette smoke, and often develop life-threatening lung disease. Some people with the deficiency lead disease-free lives, never knowing they have defective genes. In others, the deficiency can lead to emphysema and cirrhosis, both progressive diseases that can be fatal.

In the clinical trial, three patients who received injections of a harmless virus containing copies of a correct gene for alpha-1 protein in their upper arms were able to produce trace amounts of alpha-1 antitrypsin for up to one year. Although the levels produced were not considered therapeutic, the study provided critical "proof of principle" that a corrected, functioning gene could trigger production of the protein. The National Heart, Lung and Blood Institute awarded a five-year, \$2 million grant to Flotte for further clinical trials studying the use of an adeno-associated virus to deliver the alpha-1 antitrypsin gene.

"When you deliver this therapy into the deltoid muscles of the arm, the muscle becomes a factory for making the protein that these individuals are missing," said Mark L. Brantly, MD, a professor of medicine and molecular genetics and microbiology at UF's College of Medicine and first author of the study.

The trial established the safety of the adeno-associated virus used to "infect" patients' cells with replacement genes, which then do the vital work of producing the alpha-1 protein. Nine patients were divided in three groups to receive the gene therapy at the General Clinical Research Center at Shands at UF Medical Center. Patients received nine injections in their non-dominant upper arms, with the dosage increasing in each group. At 365 days after the injections, the transferred genes were measurably producing alpha-1 protein in the three patients who received the highest dose, showing that the normal gene was successfully transferred and had begun doing its intended job in the patients' muscles.

"I hope the alpha-1 community is as encouraged as I am that although this trial does not give us any guarantee, there is a fighting chance to develop a therapy using this method," said Flotte. "In patients receiving the highest dose in this study, we saw transgene expression. And although it approached just 1 percent of what we ultimately want, we can be reasonably optimistic that we can achieve much closer to normal values in people by using the same approach with an increased dose."

Although patients showed some elevated immune response to the gene therapy vector—which is designed to break down quickly after delivering its cargo—researchers did not detect any evidence that the patients' bodies rejected the transferred genes or the newly created protein.

"That's a really good sign," said Dr. Brantly, a member of the Powell Gene Therapy Center and the UF Genetics Institute, who sees about 150 alpha-1 patients in his medical practice. "After we gave the injections, the individuals stayed on the ward for five days while we monitored them. There were no ill effects, only a minimal amount of redness, and by the end of the five days most of the subjects were actually bored."

Currently, the only limitedly effective treatment for patients with serious breathing symptoms involves weekly intravenous injections of alpha-1 protein derived from human plasma. The injections must continue throughout a patient's life, according to the American Lung Association. They do not cure the disease, but they do appear to slow its progression.

"This study gives us encouraging evidence that gene therapy for alpha-1 is a realistic possibility," said John Walsh, president and chief executive officer of the nonprofit Alpha-1 Foundation, which has been supporting research of this kind for more than a decade. "The augmentation therapy available now has slowed down the progression of lung diseases and has extended many of our lives. The hope of gene therapy is that we may have a one-time, brief series of injections that could allow our own bodies to produce the alpha-1 protein we need to live a normal lifetime. The alpha-1 community is incredibly grateful for the progress that these dedicated investigators have made."



New integrated research database helps researchers quickly test hypotheses

[<< Back](#)



Ralph Zottola, PhD, associate chief information officer for Academic and Research Computing Services

Clinical and Translational Science Awards (CTSA) were created by the National Institutes of Health to do something very specific: accelerate the process of turning research science and data into therapeutics. Far from being research as usual, these grants help the nation's top research institutions create programs and infrastructure that will speed research discoveries into medical practice. Instead of funding solitary investigators in a laboratory, these grants put the tools for fast-tracking cures and treatments into the hands of researchers collaborating across institutions and across the country.

One of the most exciting examples of these tools at UMass Medical School is a new integrated clinical research database, created jointly by UMMS and its clinical partner, UMass Memorial Health Care. The Massachusetts Integrated Clinical Research Database, known as MICARD, helps researchers overcome one of the key obstacles facing physicians and clinicians who want to test research questions and hypotheses rapidly and efficiently: how can a researcher, in his quest for medical breakthroughs, determine if there are patients who meet potential study criteria in an environment where patient records are tightly protected and access is rightfully regulated?

"Before informatics tools like MICARD, a clinician who was interested in exploring a research question had no way of efficiently compiling large groups of well-characterized patients," said Ralph Zottola, PhD, associate chief information officer for Academic and Research Computing Services. "For clinicians interested in determining whether there was a cohort of patients who met certain criteria, the process could take months."

MICARD, based on an informatics program originally developed at Partners Health Care, has changed this. "The result of our collaboration with UMass Memorial means that qualified investigators may use the MICARD tool to determine whether there are patients who have been treated at UMass Memorial who meet clinician-specified criteria," said Dr. Zottola. That criteria includes demographics, diagnoses, medications and laboratory values. Because the patient counts are collected together from different sources and stripped of identifying information, patient privacy is protected—in fact, increased—and the process is streamlined.

The Partners tool—known as i2b2, or Informatics for Integrating Biology and the Bedside—was developed to enable researchers to use existing clinical data for discovery research and ultimately facilitate the design of targeted therapies for patients with diseases having genetic origins. MICARD, UMMS' implementation of i2b2, offers UMMS researchers a tool to quickly generate new research hypotheses and identify potential cohorts for clinical trials. It also serves as a resource to catalog biological samples from the UMMS Conquering Diseases Biorepository. Such efficient access to data points is key to preparing grant applications that would benefit from pre-identification and/or characterization of a potential research cohort, said Zottola.

"Even more excitingly, MICARD will enable us to federate with other institutions using the i2b2 platform, increasing a researcher's ability to identify potential cohorts for rare diseases and increase the potential for collaborative studies," he said. The MICARD system already contains more than 270 million discrete, de-identified facts available for query by researchers. Work is ongoing to add more data sources to make this a richer system for translational research.

"MICARD is one component of our translational research IT strategy. UMMS also made significant investments to increase the capacity and security of the data center to support clinical research. UMMS researchers also have access to the REDCap software platform for electronic data capture," said Zottola. REDCap was developed at Vanderbilt University and provides a streamlined process for building study-specific clinical research databases and surveys. The REDCap Consortium is comprised of 127 institutional partners across the world.

Work on MICARD and related tools useful for accessing databases of clinical information began more than two years ago. By working with UMass Memorial and the research and clinical leadership, UMMS was able to construct a system that permits fast and intuitive access to information useful in testing research hypotheses, while tightly protecting patient privacy and preserving data integrity. Excitement surrounding these bioinformatics tools and the CTSA was evident at a recent forum aimed at introducing faculty to MICARD and its potential: nearly 100 faculty filled the UMMS Faculty Conference Room for the rollout of these new tools.



President Jack M. Wilson: Five campus collaboration the key to a strong CTSA application

[<< Back](#)

Statement from Jack M. Wilson, president of the University of Massachusetts

This is a landmark moment for the University of Massachusetts Medical School and for the UMass system as a whole. This \$20-million award from the National Institutes for Health recognizes the pioneering quality of the research being conducted at UMass Medical School and the acute need to convert it into therapies that will improve and save lives.

It is because UMass Medical School's research is so remarkable that the need to bring its fruits to the bedside is so compelling. I want to commend Chancellor Michael F. Collins, Dean Terence R. Flotte and Vice Provost for Research John L. Sullivan for leading the team that has garnered this NIH Clinical and Translational Science Award.

I am very proud to note that this effort will include scientists and researchers from all five UMass campuses, working in collaboration. It is clear that our grant application was strengthened by the fact that skills and expertise from all five campuses are being harnessed in this effort. This is a very proud moment for the UMass and further testament to the enormous growth and maturation we are seeing at the Medical School and throughout the UMass system.



UMass President Jack M. Wilson

For additional information, visit the [UMass Center for Clinical and Translational Science](#).



The UMass Medical School Community Reacts

[<< Back](#)

- "In my nearly 30 years at this institution, this is one of the most important grants that we have received. It will re-invigorate the faculty, staff and trainees to greater heights of learning, teaching and applied research."
Robert J. Goldberg, PhD, professor of medicine and chief of the Division of Epidemiology of Chronic Diseases and Vulnerable Populations in the Department of Quantitative Health Sciences
- "Receiving this award places UMMS firmly in a group of leading academic health sciences centers that are at the forefront of clinical and translational research. It validates my decision a year ago to join UMMS, an institution on a rapidly ascending trajectory and a very exciting place to be. My work both as the chair of a new department and as a researcher will be greatly enhanced by the national opportunities that will become available to us because we have a CTSA." **Catarina Kiefe, MD, PhD**, chair and professor of quantitative health sciences and professor of medicine
- "The NIH CTSA recognizes the great strengths of the UMass Medical School research enterprise as well as the potential for UMMS to be a national and international leader in clinical and translational research. When I arrived seven years ago, the basic sciences were nationally recognized and the leadership was building infrastructure for clinical and translational research of equal quality. This commitment stemmed from a desire to innovate in clinical care and to be a leader in the translation of these discoveries to patient care. The CTSA acknowledges that this vision is becoming a reality."



Robert J.

Goldberg, PhD



Catarina Kiefe, MD, PhD



Patricia D. Franklin, MD

- "Using CTSA-funded infrastructure, my colleagues and I hope to develop novel medical informatics tools that will allow patients with advanced arthritis to better care for their condition, monitor its impact on physical function and actively engage in evidence-based health care decisions. The UMMS system-wide clinical database will allow longitudinal studies of patient outcomes to define 'best practices' to ensure all patients receive optimal care. Finally, the CTSA will allow UMMS to continue refining the training programs for emerging physician-scientists who will lead the future of translational research." **Patricia D. Franklin, MD, MBA, MPH**, the *Joy McCann Professor for Women in Medicine*, associate professor of orthopedics & physical rehabilitation and family medicine & community health, and director of clinical and outcomes research in the Department of Orthopedics and Physical Rehabilitation
- "The CTSA grant confirms the strength of our research program and our organization, and demonstrates support for our vision for translational research—that UMMS has 'the right stuff' to increase the efficiency and speed of clinical and translational research, leading to new discoveries and improved quality of life for all people. It is validating for me personally as well; one of my roles in this effort was to develop IT infrastructure to support translational research. I am grateful for the trust, support and latitude provided by institutional leaders, specifically Vice Provost for Research John Sullivan, School of Medicine Dean Terence Flotte and Chief Information Officer Robert Peterson."



Ralph

Zottola, PhD

"UMMS was one of the first institutions to adopt the i2b2 platform for clinical research informatics, which has subsequently been adopted by more than 50 institutions worldwide. The platform became a tangible driver for our entire IT strategy, which has thrust UMMS into the forefront, as evidenced by the frequent consultation and speaking requests and the fact that several other institutions have adopted our model."

"This grant has had a big impact for me already. I have been involved since the first writing teams were created and, for the past three years, I have been working closely with people in both the Medical School and with our clinical partner, UMass Memorial Health Care, to plan, design, implement and support infrastructure to enable translational research. This challenge has brought our organizations closer together and the collegiality feels good. I know it will eventually make a difference in people's lives." **Ralph Zottola, PhD, ACIO**, Academic & Research Computing Services

- "UMass Medical School is among the premier group of academic health sciences centers committed to aligning and advancing their research efforts toward meaningful health outcomes for patients and populations. This award demonstrates UMMS research achievements, planning and investment in research infrastructure, and substantial promise for the future. The Office of Faculty Affairs is committed to the goal of promoting strategies to enhance faculty development and advancement. Targeted and tailored professional development programs, coupled with effective research mentoring, can provide support for faculty to gain new skills and knowledge in clinical and translational research. We will provide programs to enhance the research development of faculty, in alignment with the strategic plan and in collaboration with the leaders of the UMass CTSA." **Luanne Thorndyke, MD, FACP**, vice provost for faculty affairs.



Luanne Thorndyke, MD



UMMS scientists test gene therapy techniques for treatment of a type of inherited blindness

[<< Back](#)

In a first-of-its-kind procedure in New England, clinical researchers at the UMass Medical School have used a gene therapy technique to introduce a normal-functioning gene into the eye of a patient with type 2 Leber Congenital Amaurosis (LCA), a rare and inherited eye disease that causes severe visual loss within the first few months of life. The procedure was performed as part of a Phase I/II clinical trial to study the safety and efficacy of using a recombinant adeno-associated virus (AAV) vector to replace a faulty gene that prevents the production of protein crucial for sight. The trial is sponsored by Applied Genetic Technologies Corporation (AGTC) of Gainesville, Fla.

"This trial marks a new era of translational medicine at the Medical School," said Terence R. Flotte, MD, executive deputy chancellor and provost and dean of the School of Medicine. "The field of gene therapy holds tremendous promise for a great many diseases, and we are quite excited to contribute to the field with the extensive biomedical and clinical research acumen of our physician-scientists. Patients across the country are eagerly awaiting the day when they can benefit from the fruits of these trials."

A degenerative disease, LCA is caused by a group of recessively inherited genetic mutations that lead to an inability to make a light-sensitive protein in the retina. "One of the most common gene mutations known to cause LCA occurs on the RPE65 gene," said Shalesh Kaushal, MD, PhD, principal investigator of the study and chair of ophthalmology at UMMS. "The RPE65 gene produces a protein that helps process vitamin A in the cells that nourish the retina. Because of the mutation, patients with type 2 LCA don't process enough vitamin A, which is important for allowing the visual proteins that detect light to sense light."

The Phase I/II trial at UMMS will evaluate the safety of using a recombinant AAV vector to deliver a normal-functioning RPE65 gene to retina cells of patients with type 2 LCA. A small virus known to occur in humans, AAV does not cause any known pathology and creates only a mild immune response in its host. Once introduced into cells, AAV has the ability to leave its genome in the targeted cells, making it a potential therapeutic delivery system for transferring normal genes to patients suffering from certain genetic disorders.

In the LCA clinical trials performed at UMMS, a fluid containing the AAV loaded with the normal RPE65 gene is introduced into the eye. "As the fluid is absorbed by the eye, the virus, along with the normal RPE65 gene, attaches itself to the retina cells," said Dr. Kaushal. "Though this trial is being done specifically to study the safety of the delivery system, the eventual hope is that this will have the therapeutic effect of increased RPE65 protein delivery by retina cells and an improvement in vision."

Interestingly, said Kaushal, the retina's lack of an immune response works in its favor. "When a foreign substance is introduced into human tissues and cells, it triggers the body's immune system," he said. "Stimulation of the body's immune system can inhibit the effectiveness of gene therapy treatments, and in some cases can have an adverse effect on the body and other healthy tissues. However, the retina lacks an immune mechanism, which makes treating eye diseases with gene therapy possible."

An expert in vitreoretinal disorders, Kaushal joined UMMS in January 2009 from the University of Florida where he was assistant professor of ophthalmology and director of vitreoretinal services. He is also one of the first researchers in the United States to use gene therapy to treat LCA. At Florida, he and Dr. Flotte had collaborated on earlier preclinical and Phase I clinical trials for this disorder.

Kaushal is a member of the Gene Therapy Center, part of the Advanced Therapeutics Cluster at UMMS. Established around the promise that lies within the application of the recombinant adeno-associated virus (rAAV), the Gene Therapy Center is performing translational research into cystic fibrosis, alpha-1 antitrypsin deficiency, lysosomal storage diseases, Canavan disease, retinal and macular degeneration, and other genetic diseases.



Led by Shalesh Kaushal, MD, PhD, chair and associate professor of ophthalmology and cell biology (seated in front), a team at the UMMS Gene Therapy Center is testing the safety of a gene therapy treatment to combat a disease that causes blindness.



Officials congratulate UMass on winning grant

[<< Back](#)

"Congratulations to everyone at the UMass Center for Clinical and Translational Science on receiving this important NIH grant. As our premier public research university, the University of Massachusetts is a vital partner in the development and implementation of our comprehensive life sciences framework. It is helping us transform and solidify the commonwealth's life sciences super cluster to grow our leadership in this sector and to positively impact the health and well-being of the citizens of Massachusetts, the nation and the world. I want to thank the NIH for its confidence and investment in the University of Massachusetts."

Governor Deval Patrick



Governor Deval Patrick

"The University of Massachusetts Medical School has shown once again that it leads the pack nationally, and this grant will help turn their cutting edge research into treatments and cures that will improve the lives of countless Americans. I'm proud that the discoveries of tomorrow will start right here in Massachusetts."

U.S. Sen. John Kerry



U.S.
Sen. John Kerry

"As the only public medical school in the state, the University of Massachusetts Medical School continues to make its mark by conducting breakthrough basic research that can be transformed into treatments and cures for patients. I am pleased that UMass has been recognized for its outstanding work. This funding will help the school move forward with research that leads to important scientific discoveries and new clinical practices."

U.S. Sen. Scott Brown



U.S.
Sen. Scott Brown

"This award reaffirms something that those of us in Central Massachusetts have known for a long time – that UMass Medical School is one of the finest institutions in the country. I want to congratulate them for this remarkable achievement."

U.S. Rep. Jim McGovern



U.S.
Rep. Jim McGovern

"As a recipient of this generous award, UMass Medical School continues to prove it is one of the nation's leading research institutions. I sincerely appreciate the support from the National Institutes of Health and congratulate the talented people at UMass Medical School whose hard work and dedication to science resulted in this investment."

Lieutenant Governor Timothy P. Murray





Lieutenant Governor Timothy P. Murray

[about UMMS](#) | [office of communications](#) | [administration](#) | [directions](#) | [UMass system](#) | [index](#) | [intranet](#) | [directory](#) | [contact us](#)

This is an official Page of the UMass Chan Medical School

Office of Communications • 55 Lake Avenue North Worcester, Massachusetts 01655

Questions or Comments? Email: UMMSCommunications@umassmed.edu Phone: 508-856-2000

[Privacy Statement](#)

[Back To Top ▲](#)