

CIMIT Supports NOTES Initiative with \$2.1 Million Grant

Team will focus on minimally invasive surgery that leaves no scars, minimizes infection

At the February 5 CIMIT Forum to celebrate the launch of its 10th Anniversary year, Executive Director John Parrish, MD, announced CIMIT's \$2.1 million Strategic Project. The award will go to a team pioneering a dynamic new technology promising surgery without scars.

Patients will benefit because NOTES leaves no scars and causes a minimum of pain.

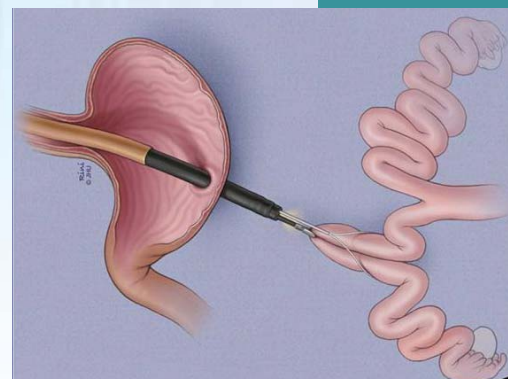
The award of \$700,000 annually for three years represents CIMIT's largest grant program. With this award, CIMIT's investment in NOTES research will top \$3 million overall, making CIMIT the largest financial supporter of this innovative technology worldwide.

NOTES is a novel technique of performing surgical procedures without making incisions on the surface of the body. It utilizes flexible endoscopes through the mouth, anus or vagina to enter the abdominal, pelvic and thoracic cavities.

"In selecting NOTES as the first CIMIT Strategic Project, we are looking for a breakthrough that has the potential for significant impact on medical care in a relatively short period of time," Dr. Parrish stated. "NOTES is an innovative approach to surgery and we are excited with its potential."

Patients will benefit

NOTES leaves no scars, causes less pain, and there is also less chance of infection. Employers will see a positive effect, too, as workers will return to the job more quickly. And those in developing countries



could benefit as well, because NOTES systems would be transportable, with little post-operative care required.

Before extensive human trials can be launched, a fail-safe method to enter cavities and then close the access site is needed. Also, the lack of small, supple instruments is a major challenge facing NOTES.

NOTES relies on a multi-disciplinary team having the skills of both an advanced therapeutic endoscopist and a laparoscopic surgeon. The procedure has stimulated much interest in the medical community, as it is an evolution of laparoscopy, the minimally invasive technique that has gained popularity since the '80s.

"More research and a greater number of carefully planned human trials must be done," said David Rattner, MD, chief of the division of general and gastrointestinal surgery at Massachusetts General Hospital and a leader of a national coalition of doctors interested in NOTES. "But I think we can all say NOTES has great potential to help patients." Dr. Rattner leads the Boston-based NOTES initiative and is the Principal Investigator of the CIMIT Strategic Project.

The Boston-based NOTES team represents four institutions and three scientific disciplines – medicine, surgery and engineering. Investigators include the following: from Massachusetts General Hospital, Dr. Rattner, William Brugge, MD; Field Willingham, MD; Denise Gee, MD; Patricia Sylla, MD; from Brigham and Women's Hospital, Christopher Thompson, MD; and Marvin Ryou, MD; from Dartmouth Medical Center, Richard Rothstein, MD; and from MIT, Jeffrey Lang, PhD.

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FEATURE :

Plug-and-Play team wins Kennedy Award for Medical Innovation

CIMIT stresses the value of creating research teams made up of principals with a variety of skill sets representing a multiplicity of institutions. In other words, many cooks make a very fine broth.

This emphasis on inclusion has been working for the talented and much-honored group that makes up the Plug-and-Play team, whose goal is patient safety. The team, led by Julian M. Goldman, MD, recently won CIMIT's Edward M. Kennedy Award for Healthcare Innovation.

The Kennedy Award is a great honor, but this team is not ready to rest on its laurels. A key goal: developing an international standard for operating room safety. The team's technology is designed to ensure interoperability of systems in the OR and other hospital areas. That means all devices and electronic systems are linked, so that information is exchanged and mistakes are minimized.

“One of our key goals is to create an international standard so that planners and administrators have guidelines that will enable them to create a failsafe hospital infrastructure.”

“We are proud to have a national team, representing public and private institutions throughout the country,” said Dr. Goldman, an anesthesiologist at Massachusetts General Hospital.

“I'd like to thank CIMIT for its support over the past several years. One of CIMIT's goals is to support early stage clinical systems innovation, and CIMIT has been a major reason why we continue to make progress.”

The collaborative team is made up of medical professionals from numerous institutions, including David Arney, PhD candidate, University of Pennsylvania; Philippe-Antoine Cortes, ME, University of Pennsylvania; Glenn Himes, PhD, MITRE Corp.; John Howse, MD, Kaiser Permanente; Jennifer Jackson, MBA, CCE, Brigham and Women's Hospital and American College of Clinical Engineering; Shankar Krishnan, PhD, Massachusetts General Hospital; Insup Lee, PhD,

University of Pennsylvania; Ronald Marchessault, Jr., MBA, Telemedicine and Advanced Technology Research Center, US Army Medical Research and Materiel Command; David Osborn,



Photos by Christopher Bowers (top & left) and Thomas J. Gustainis (bottom)



Philips Medical Systems; Heidi Perry, Draper Laboratory; Tracy Rausch, DocBox Inc.; Jeff Robbins, LiveData Inc.; Michael Robkin, Kaiser Foundation Health Plan; Richard Schrenker, MSEE, Massachusetts General Hospital; Bill Seitz, IXXAT, USA; Carl Wallroth, PhD, Draeger Medical; Sandy Weininger, PhD, Food and Drug Administration; Susan Whitehead, CIMIT.

“We are extremely proud of the work done by this team, whose members are making impressive progress in developing standards for the OR and ensuring better care for patients,” said John Parrish, MD, Executive Director of CIMIT. ■

IN FOCUS:

Program Leaders Offer Vision and Insight

Each year, CIMIT actively supports nearly 160 research projects. Some are in start up mode; others are transitioning to the next phase in the innovation cycle.

How does this multi-institutional consortium seek out, select and support truly novel ideas that have the potential to dramatically improve patient care? Through its team of Program Leaders — each a clinical champion and nationally recognized leader in their field.

Twelve program leaders, focused on the most urgent areas of healthcare, form the clinical nucleus of the CIMIT community — a vibrant and powerful network connecting many of the most brilliant scientists, engineers and clinicians in Boston.

Program Leaders wear many hats: visionary, subject matter expert, accomplished innovator, mentor and compassionate clinician. An authority on a given medical specialty, Program Leaders serve as head coach for the teams of investigators within their program area, imparting advice and offering encouragement as the researchers explore the science for which they have received a CIMIT grant.

Program Leaders also recruit new researchers into the CIMIT community. Years of personal experience make it easy for these talented physicians to spot the potential of a young clinician who has what it takes to become a successful innovator. Each actively cultivates the next generation by helping form multidisciplinary collaborations, providing expert guidance on overcoming the barriers to innovation and when necessary offering access to a national network.

More globally, Program Leaders challenge CIMIT to pursue emerging areas of clinical need, where devices and other technologies could make a powerful difference in the standard of care.

The Program Leader acts as a mentor to investigators and researchers, imparting advice and offering encouragement.

“Program Leaders are essential to the development of research teams, who seek financial and facilitation support from CIMIT,” said John Parrish, MD. “Their knowledge and experience open the door to a successful career path for clinicians who seek to make a difference in their patients' lives through better devices and less invasive procedures.”

Program Leaders, together with Site Miners, CIMIT Facilitation staff and outside experts form the annual peer review team for awarding CIMIT grants. This multidisciplinary team of clinical and scientific subject matter experts guides the highly competitive process to identify, evaluate, and select novel, technology-based solutions that have the potential to significantly improve patient care.

“We look for truly novel ideas based on solid science and engineering that can significantly impact patient care,” said Steve Schachter, MD, chair of the CIMIT

- Biodetection & Sepsis Control
Jeffrey Gelfand, MD
- Biomaterials & Tissue Engineering
Jeffrey Borenstein, PhD
Joseph Vacanti, MD
- Cardiovascular Disease
Tom Brady, MD
Ahmed Tawakol, MD
- Clinical Systems Innovation
Jay Schnitzer, MD, PhD
- Global Health Initiative
Kristian Olson, MD, MPH
- Image Guided Therapy
Ferenc Jolesz, MD
Ron Kikinis, MD
- Minimally Invasive Surgery
David Rattner, MD
- Neurotechnology
Steven Schachter, MD
- New Initiatives
Kirby Vosburgh, PhD
- Optical Diagnostics
Gary Tearney, MD, PhD
- Simulation
Steven Dawson, MD
- Trauma & Casualty Care
George Velmahos, MD, PhD



Science Review process and Program Leader for Neurotechnology.

Program Leaders, like Site Miners, help researchers find engineering-based collaborators who can help their projects succeed. These engineers and computer-science experts offer the technology expertise necessary to develop promising devices or useful clinical systems.

Jeffrey Gelfand, MD, Program Leader of the new Biodetection & Sepsis Control program, said, “As someone who has experience with CIMIT and the greater medical community, I am looking forward to helping shape this important new program and to guide researchers as they launch their CIMIT-supported initiatives.” ■

GUEST COLUMN :

Collaboration is Essential in Developing NOTES

By Christopher Thompson, MD

Research is often most effective through collaborative approaches. Interdisciplinary and inter-institutional cooperation is contributing significantly to the success of the NOTES initiative.

An emerging technique in the gastrointestinal field, Natural Orifice Transluminal Endoscopic Surgery gives surgeons access to internal organs by putting medical tools into the body through orifices such as the mouth, vagina and anus. CIMIT was a major supporter of local research teams as they began exploring its potential. The growing appeal of NOTES was evident last summer when more than 400 GI specialists, many from overseas, traveled to Boston to share information and discuss their research.

CIMIT helped get us started. Now private industry is investing and providing logistical support. Clinicians from across the country are interested. Momentum is building.

A revolutionary approach to surgery requires a revolutionary approach to research.

Goal of NOTES is to help patients

Our purpose in pursuing this novel approach to surgery is to help patients. By entering the body through the mouth, for instance, we will be offering a more benign procedure. Unlike conventional surgery, we do not slice into the body. There will be less physical trauma and no exterior scarring. There is a diminished chance of infection. Patients will get to return to their everyday lives more quickly. Medical institutions benefit too, for we anticipate fewer complications and predict patients will experience shorter stays.

A revolutionary approach to surgery requires a revolutionary approach to research. That is why the NOTES initiative is a multi-city, multi-institutional collaboration of surgeons and endoscopists from the leading academic medical centers. Supporting this innovative approach to non-invasive surgery are two international professional societies. Convinced by their own society leaders that *surgery without scars* was possible, the American Society for Gastrointestinal Endoscopy (ASGE) and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) joined forces to create a national collaboration called the Natural Orifice Surgery Consortium for Assessment and Research (NOSCAR). This working group, supported by the strength of their societies, has moved NOTES from novel idea into “first in man” studies in less than 5 years.

NOTES relies on a multidisciplinary team having the skills of both an advanced therapeutic endoscopist and a laparoscopic surgeon. Boston has been a pioneer in NOTES because of the vision of Dr. David Rattner, chief of general and gastrointestinal surgery at MGH, who encouraged CIMIT to provide critical support in the nascent days of NOTES. This early financial support of working groups and other science projects has enabled us to continually examine new concepts in this innovative approach to surgery.

We’ve accomplished a lot, yet there is still so much to do. Together, this collaboration of GUI specialists worldwide are united in one goal: better patient care.

Christopher Thompson, MD, MSc, is Director of Developmental Endoscopy, Division of Gastroenterology, Hepatology and Endoscopy and Associate Physician, Brigham and Women’s Hospital; and Assistant Professor of Medicine, Harvard Medical School. ■

SPOTLIGHT ON INDUSTRY:

CIMIT Gets Fit with Help from BodyMedia

By Tamara Nazzal

This fall CIMIT staff participated in Be Fit, a 10-week program for Massachusetts General Hospital employees designed to improve health through education, healthy eating and exercise. Six teams of 25 each competed in five categories including weight loss, number of steps taken per day, number of workouts, records of food intake, and overall team achievement.



Joining the CIMIT team were individuals from the MGH Lab of Computer Sciences. Keeping with the CIMIT mission of integrating novel technologies into healthcare objectives, team members Penny Ford-Carleton, Program Director for Point-of-Care Technologies, and Ann Humphrey, manager of the Industry Liaison Program (ILP), sought the help of BodyMedia.

BodyMedia, a member of the ILP, is a leader in the design and development of wearable body monitoring products and services. BodyMedia contributed 25 SenseWear devices so the team could monitor progress on a daily basis. Data collected by the

device is easily downloaded online and supplemented by the daily recording of food intake, providing real-time information of individual and team progress.

Ann Humphrey described the benefit experienced by many, “Having real-time information allowed me to see if I was on target for meeting my daily goals. If my activity level was low, I was able to modify my behavior.”

The device, which is worn on the upper arm like a jogger wears an iPod, interprets



Photo by Christopher Bowers

IN BRIEF :

CIMIT PI appointed Jolesz Chair in Radiology Research

Clare Tempany-Afdal, MD, has been named as the first incumbent for the Ferenc Jolesz, MD Distinguished Chair in Radiology Research.

Donald Ingber Steps Down as Site Miner

Donald Ingber, MD, PhD, will be stepping down as the CIMIT Site Miner for Children's Hospital Boston in order to concentrate full-time on his research in Vascular Biology.

Jeff Gelfand named Program Leader

Jeff Gelfand, MD, MGH, has been named Program Leader for the new Biodetection & Sepsis Control Program.

John A. Parrish to Appear in Biotechnology Leader Exhibit

John Parrish, MD, Director of CIMIT, will be one of the Boston biotechnology leaders featured in an exhibit at the Hynes Convention Center this spring.

John A. Parrish and R. Rox Anderson to Receive 2007 Discovery Award

John A. Parrish, MD, Director of CIMIT, and R. Rox Anderson, Director of the Wellman Center for Photomedicine, are the recipients of the Dermatology Discovery Award for their discovery of Selective Photothermolysis, the basis of many laser therapies.

INSIGHTS :

By John Parrish

The New Year offers new opportunities and great promise for improving patient care.

As we begin 2008, I will be dedicating 100 percent of my time and efforts to CIMIT and our important mission.

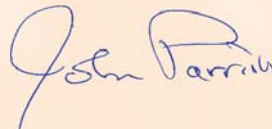
It is with high goals and great anticipation that I am able to focus all of my energy on leading CIMIT into the future. These are transformational times in the arena of medical devices and procedures, and CIMIT is perfectly positioned to capture these opportunities to improve patient care.

In 2008, CIMIT will celebrate a decade of transforming healthcare through technology. In 10 years we have supported over 270 Principal Investigators and their collaborators, more than 13 new devices or procedures are already in clinical practice, 14 more are currently in clinical trials and many more are in the pipeline. Over 4000 patients have been treated in the Operating Room of the Future, 12 companies have been formed, over 60 companies are actively involved in our industry liaison program and 150 million dollars in additional 2nd round research funding from other sources has been enabled because of the 140 million dollars in grants awarded by CIMIT.

The CIMIT community is a vibrant and powerful network connecting many of the most accomplished scientists, engineers and clinicians in Boston. In 2008 we are preparing to leverage the power of the CIMIT network nationally and internationally. By early spring, we plan to announce several strategic alliances with other world-class academic medical centers and industry.

Also during our anniversary year, CIMIT will introduce new opportunities in convening — through virtual experience and our more traditional Tuesday Forum. Yet more importantly, CIMIT will be supporting the important work of our investigator community by funding novel ideas for early stage, high-risk, multidisciplinary research in devices and procedures.

The future is bright, the opportunities are plentiful and CIMIT has the network of brilliant minds ready to meet these challenges. Together we can and will drive change in healthcare through technology and deliver exceptional patient care in the right place, at the right time for both soldier and civilian populations.



John A. Parrish, Director ■



caloric burn, steps taken and how long the wearer sleeps. The device contains an accelerometer and physiological sensors to measure heat flux, galvanic skin response and skin temperature.

Blending technology with a good health and wellness routine works well: The CIMIT team won three out of the five performance categories! ■

FEATURE :

Young Clinicians Benefit from Research Grants

CIMIT knows how challenging it is for clinicians to both develop a practice and pursue research interests. So it has worked to develop a program to provide grants to promising young doctors who also want to engage in research.

Johnson & Johnson stepped up as the lead sponsor last year, and the Johnson & Johnson Young Clinician Awards have provided grants so that top clinicians can be productive in the lab. This generous educational program has helped them to move forward in their careers.

Past recipients of Young Clinician Awards include Yolonda Colson, MD, PhD, Brigham & Women's Hospital; Michael Davidson, MD, Brigham & Women's Hospital; James Ellsmere, MD, Beth Israel Deaconess Medical Center; Daniel Kohane, MD, PhD, Massachusetts General Hospital; and Audrey Chung Marshall, MD, Children's Hospital Boston.

For Dr. Ellsmere, the grant was crucial for him to pursue a dual career goal of clinic and research.

"The tendency for junior surgery faculty is to become heavily loaded with clinical care responsibilities, and put their research interests on a back burner," said Dr. Ellsmere, who was working on a novel device to effectively manage the care of patients after gastric bypass surgery. "The Young Clinician funding enabled me to set aside time to focus on device development, and I look forward to several future projects building on the success of this work."

Dr. Marshall is developing a positioning device to enable minimally invasive in-utero cardiac intervention for babies with congenital heart disease.

"The Young Clinician Award has given me the resources to make it easy to pursue the ideas that I've had in a very exploratory way," said Dr. Marshall. "Because I am usually with patients, the grant has provided flexibility in terms of time and budget. And it has made it easier to find collaborators and attract others to pursue this with me."

CIMIT's commitment to education has helped clinicians not only to launch research projects, but to disseminate information and share the learnings.

Dr. Davidson, a cardiac surgeon at Brigham & Women's Hospital, is working on percutaneous repair of damaged heart valves without the need for open-heart surgery. His Young Clinician Award enabled him to cross-train with surgeons from Boston and Cleveland to learn new techniques.

"The experience enabled me to learn from others, and I am trying to pass that knowledge along to other doctors at BWH," said Dr. Davidson. He said that surgeons can learn from each other in the rapidly growing field of minimally invasive surgery. ■

CIMIT CALENDAR :

**CIMIT Cardiovascular Conference
High-Risk Plaques: Detection and
Management**
May 3-4, 2008

*For more information on this
and other events visit cimit.org*

FUNDING OPPORTUNITIES :

Science Grants	<i>Feb. 9, 2008</i>
Clinical Systems Innovation Grants	<i>Feb. 9, 2008</i>
Working Group Grants	<i>June 1, 2008</i>
Clinical Fast-Forward Grants	<i>June 1, 2008</i>
Career Development Grants	<i>June 1, 2008</i>
New Concept	<i>Anytime</i>

*For more information on these and other funding
opportunities visit cimit.org*

CIMIT CONSORTIUM :

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Boston Medical Center
Boston University
Brigham and Women's Hospital*
Charles Stark Draper Laboratory*
Children's Hospital Boston
Harvard Medical School
Massachusetts General Hospital*
Massachusetts Institute of Technology*
Newton-Wellesley Hospital
Partners HealthCare System

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