

## Brown event assembles network of healthcare leaders, innovators

BY MARY KORR  
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PROVIDENCE—At the recent Rhode Island Healthcare Showcase, Gov. Lincoln Chafee noted the Alpert Medical School on Richmond Street was once “a jewelry building where foot-press machine operators worked.”

The Jewelry District is now the Knowledge District which, like its predecessor, also fuels the state’s economy, he told the audience of innovators, entrepreneurs, healthcare and business leaders.

Brown University Provost **MARK SCHLISSEL, MD, PhD**, echoed Gov. Chafee with a timely announcement – that a trio of university scientists, **JOHN DONOGHUE, ARTO NURMIKKO** and **LEIGH HOCHBERG**, had just been awarded Israel’s inaugural B.R.A.I.N. (Breakthrough Research And Innovation in Neurotechnology) prize of \$1



PHOTOS BY MARY KORR

Keynote speaker John Brooks III, president and CEO of Joslin Diabetes Center in Boston.



Gov. Lincoln Chafee and Brown University Provost Mark Schlissel, MD, PhD, introduced the Healthcare Showcase held recently at the Alpert Medical School.

million for their BrainGate system. (See sidebar next page.)

“What begins as basic medical research can end up not just driving the local and national economy but taking that knowledge and using it for the purposes of innovation for the benefit of society,” Dr. Schlissel said. “That’s the real sweet spot.”

He said the prize will be used to further develop BrainGate to make it viable for commercialization, “which is part of our motivation here today. Academic institutions are drivers,” he said, but “the private sector is important to this pipeline. The federal government and even disease foundations have limited capacity to help institutions take advantage of decades of progress in biomedical research and help it bear fruit for patients.”

### Keynote speaker

Dr. Schlissel introduced the keynote speaker, entrepreneur and venture capitalist **JOHN L. BROOKS III**, the president and CEO of the Joslin Diabetes Center. Brooks spoke on macro trends, innovations, and forces shaping healthcare, not just in the future but “now playing out in prime time.”

The following are highlights of his presentation.

### On Personalized Medicine/ Genomic profiles

Brooks said today people diagnosed with cancer get a full genetic analysis to tailor treatment protocols and that this is spreading into other areas of medicines. “How do we start harnessing the power of the genomic profile?” he asked, and noted healthcare providers



Arto Nurmikko, left, and John Donoghue accepted the B.R.A.I.N. Prize, the first to be awarded, from Israeli President Shimon Peres at the BrainTech 2013 Conference held in Tel Aviv, Israel, in October.

## BrainGate team wins \$1M prize in Israel

PROVIDENCE — The team that created the investigational BrainGate brain-computer interface has won a major international award, the \$1-million Moshe Mirilashvili Memorial Fund B.R.A.I.N. Prize, at a brain science technology conference in Israel Oct. 15, 2013.

Israeli President Shimon Peres presented the prize, including a bronze brain statue, to John Donoghue and Arto Nurmikko, two Brown University researchers who represented the BrainGate collaboration in the competition for the prize.

"We are deeply honored to receive this award," said Donoghue, co-director of the BrainGate team, a researcher at the Providence V.A. Medical Center and the Henry Merritt Wriston Professor at Brown, where he directs the Brown Institute for Brain Science. "It will support our continued research to help people with paralysis, some of whom cannot speak, to restore their connection to the world around them."

The prize is awarded "for a recent breakthrough in the field of brain technology for the betterment of humanity," according to a statement by Israel Brain Technologies (IBT), a nonprofit organization inspired by Peres that grants the award. The contest's panel of judges — experts in neuroscience and technology, including two Nobel laureates — considered presentations from 10 finalists before selecting BrainGate.

### Clinical trials

The investigational BrainGate system, initially developed at Brown and now being studied in clinical trials with partners including Massachusetts General Hospital, Stanford University and Case Western Reserve University, employs a baby aspirin-size device with a grid of 96 tiny electrodes that is implanted in

the motor cortex. The electrodes are close enough to individual neurons to record the neural activity associated with intended movement. An external computer translates the pattern of impulses across a population of neurons into commands to operate assistive devices, including robotic arms.

More recently the team has advanced the work by developing and testing a novel broadband wireless, rechargeable, fully implantable version of the brain sensor. The prototype system, which has been tested in animal models, is designed to allow greater freedom for users of the BrainGate system, who currently must be connected to the system's computers via a cable. Nurmikko, a neuroengineer, has led the effort to develop the wireless implant.

The co-leader of the BrainGate team, Dr. Leigh Hochberg, was not able to join Donoghue and Nurmikko in Israel, as he was in New Orleans to deliver a Presidential Symposium Lecture at the American Neurological Association. He said he shared the team's excitement in winning the prize.

"All of us on the BrainGate research team are deeply honored to receive this award," said Hochberg, associate professor of engineering at Brown, a neurologist at Massachusetts General Hospital, and a researcher at the Providence V.A. Medical Center's Center of Excellence for Neurorestoration and Neurotechnology. "Our team of clinicians, scientists, engineers, and the extraordinary participants in our ongoing pilot clinical trial, continue to work every day toward developing a technology that will restore communication, mobility, and independence for people with neurologic disease or injury." ❖

and payers are saying: 'Let's match treatments that are going to be effective for the individual.'

He said the traditional pharmaceutical model of one drug or one-way fits all patients is "no longer the way we ought to be thinking."

### Shortage of physicians/ role of healthcare extenders

Brooks addressed the issue of physician shortage worldwide, exacerbated by the macro trends of a rapidly aging

'...Retailers are putting themselves in a position to become primary healthcare sites – going from just offering flu shots to becoming a healthcare destination.'

population, obesity, and people living longer with chronic diseases.

"Major retailers are putting themselves in a position to become primary healthcare sites – going from just offering flu shots to becoming a healthcare destination. It's one-stop shopping – you'll get your healthcare, prescriptions, food, and think about your health and wellness in the big box stores. Healthcare extenders, not MDs, are delivering this care a lot more. That phenomenon is fast upon us and again it creates some interesting opportunities. How do traditional providers respond to that?"

### Data meets healthcare

"We're also seeing the impact of big data," he said. "There are opportunities around analytics and interest in doing deep dives in electronic medical records and finding outliers and identifying anomalies."

"Where do we see problems with patients or patient cohorts or providers that may be not be following the best practices? Where are the opportunities for improvement?"

"We think a lot about risk strat-

ification – again the concept of no-one approach fits all. A lot of companies large and small are starting to help drill into EMRs. There is a lot of power in information; insights can be gleaned.”

#### Connectivity: Apps, portals, cell phones

“How do we use the power of cell phones, connectivity, apps, to basically try for efficiency and give patients more connectivity around their health and wellness?” he asked and then used the example of a program at Joslin geared to college students with diabetes, which uses virtual visits to keep them connected to their healthcare team and endocrinologists.

He said patients (and their families) are now able to fully connect to their healthcare teams through protected email exchanges and secure portals to access their electronic medical records.

He saw innovative needs in building enhanced artificial intelligence into

devices people use, such as glucose meters, to better manage their care with the hope of keeping them healthy at home, and avoiding expensive ED visits and re-visits, “which are no longer covered by many healthcare plans.”

Clinical decision making is absolutely critical, he said, but the challenge is to take the “ton of information” that is coming off diabetes monitors, pumps, Fitbits, and turn it into something actionable, clinically relevant, giving more tools to primary care physicians to drive that. Lots of start-up companies are working on this, he said.

#### Economic forces

“We’re seeing a lot of risk-based, capitated, global and bundled payments – putting economic constraints around care,” he said.

He said payment to providers is going to be based on how well they actually deliver value and this is extending to device companies and pharmaceutical

firms. “They are no longer going to be paid for just selling a product. They need to be part of the ecosystem that says my products, along with the other services, collectively are going to take costs out of the equation.”

Brooks also spoke of increasingly high deductibles employees are choosing to keep down their health plan payments. “We’re seeing a lot of tiered healthcare. In Massachusetts, for instance, some of the big teaching hospitals are basically in Tier 3, which means that patients who want to go to those hospitals are going to have to pay a lot more money out of their own pocket if they want to continue to go to those providers, since their deductibles are so much higher today.”

And, he added, medical tourism continues, where “employers are packing up their workers and spouses and putting them on planes to India or China for ortho or cardiac procedures because it’s cheaper.” ❖

## NIH awards Cardiovascular Research Center at RIH \$7.3M

*Will support research into prevention of sudden cardiac arrest*

PROVIDENCE – Rhode Island Hospital’s Cardiovascular Research Center (CVRC) has been awarded a \$7.36 million research project grant (R01) from the National Heart, Lung and Blood Institute of the National Institutes of Health to study sudden cardiac arrest. The research will be focused on mechanisms to develop new therapies and strategies to prevent sudden cardiac arrest and to measure the impact of genetic and environmental factors on risk for sudden cardiac death. The grant will be paid out over five years and is the largest grant of its kind to be paid to a Lifespan partner hospital.

The grant will be approximately \$1.5 million per year, and is specific to the research project, A Multi-Scale Approach to Cardiac Arrhythmia: from the Molecule to the Organ.

“R01 grants from the National Institutes of Health are incredibly

difficult to come by and are highly competitive,” said **GIDEON KOREN, MD**, director of the center, who was recruited in 2005 to launch it.

The CVRC is home for 43 investigators including undergraduate students, graduate students, post-doctoral fellows, research associates and faculty, and receives over \$3.8 million in direct costs from the federal government. It will work in collaboration with researchers at Brown University, Northeastern University, Pennsylvania State University, and the University of California, Los Angeles.

“This award from the NIH is a remarkable achievement,” said **PETER SNYDER, PhD**, senior vice president



Gideon Koren, MD, director of the Cardiovascular Research Center at Rhode Island Hospital with Gov. Lincoln Chafee at a press conference held to announce the \$7.36 million grant.

and chief research officer for Lifespan. “It underscores the quality of the research at Rhode Island Hospital and provides our researchers with the means to continue to explore new treatments and preventative measures of an illness that takes thousands of lives each year in the U.S.” ❖