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### A rite of passage

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### Duke-NUS to lead diabetes research with new metabolomics platform

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### Medical students with the heart of a servant leader

For Duke-NUS students and alumni, service to the community and the less fortunate is an intrinsic part of their ethos and all part of the school spirit...

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## VITAL SCIENCE

A quarterly e-newsletter produced by the Office of Communications and Development  
Editorial & Production: Praise Tan, Wee Lai Ming (Duke-NUS)  
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*This issue's banner shows our graduates, Dixon and Li Ming in their residency. Not only have their residency postings been a period of invaluable experiential learning, the hands-on training so far – comprising two four-month postings in internal medicine and in general surgery – has helped our Duke-NUS graduates cement their passion for medicine. Read about them in "[A rite of passage](#)".*

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## A rite of passage



*Dr. Dixon Grant and Dr. Ong Li Ming in the wards*

*Not only have their residency postings been a period of invaluable experiential learning, the hands-on training so far – comprising two four-month postings in internal medicine and in general surgery – has helped Duke-NUS graduates cement their passion for medicine. Vital Science catches up with Dr. Ong Li Ming, Dr. Dixon Grant and Dr. Cecilia Kwek to find out how they are doing. The trio started their residencies after their graduation in July 2011.*

Amid numerous ward duties such as attending to calls, doing procedures and tackling the occasional medical emergency, residency training has left an indelible impression on three Duke-NUS medical school graduates.

Dr. Ong Li Ming, who is on a residency with Singapore Health Services (SingHealth), recalled her first night of being on call. "I had to make key snap decisions, especially if the medical officer happened to be busy. I had to also decide which patients I should attend to first." The feeling of responsibility was both nerve-wrecking and empowering, but her experience helped her gain confidence, think on her feet and learn to seek second opinions from more senior doctors.

## Beyond medical care

One of the most memorable cases she handled was with her classmate, Dr. Dixon Grant. "The patient had liver failure and was bleeding severely from the rectum," recalled Dixon, "No one knew exactly where the bleeding site was, so we did a scope to examine the intestines." Later, Dixon, Li Ming and the medical officer took turns going to the blood bank. "We wanted to personally pick up the blood even though we could wait for it to be delivered," said Dixon, "Along with the medical officer's help, we stabilized the patient quickly and made sure she received the necessary treatment."



*Dr. Dixon Grant, SingHealth resident in Internal Medicine*

After the patient was moved to a high dependency ward, Li Ming and Dixon continued to monitor the situation and reassure the patient's daughter. "The daughter was very grateful and wanted our

full names so that she could write a note of appreciation. We declined as we felt this was really part of our jobs," said Li Ming.

## A sense of family

Poignantly, Li Ming's classmates were treating her father at the same time Li Ming was doing her residency. "My fellow graduates from Duke-NUS, who were on their neurology posting in SGH, were looking after my father. It was a relief for me to have them give me updates and personally attend to my dad." The knowledge not only reassured her, but added to the feeling that she was a part of a greater community - a family.

In fact, Li Ming feels connected to her new professional family and is grateful that her Duke-NUS clerkship at SGH helped instill a sense of belonging even before she first started her residency. "Some of the consultants who taught us actually recognize us now that we are house officers," she said. "I never thought that among all the many students they teach, they would still remember me from my school days."

## Finding a voice

The transition from a student to a full-fledged doctor has been a time of personal and professional growth for Li Ming. She said, "I feel I have found my voice in Duke-NUS ... I remember my America-trained mentor who encouraged us to speak up. I learnt that I can contribute if I speak my mind and that there are no silly questions. By asking, you may find that you are the only one who has thought of this scenario or solution. This makes a difference in our learning and in our work." Her residency has helped Li Ming come into her own. "Before this, I was quite reserved and shy. I often thought that I didn't know as much as others. However, the experience and pride of being in the first graduating class of Duke-NUS has driven me to want to prove to myself that I am good at what I am doing, and to push myself even harder to serve our patients."

## Finding new personal limits

Dr. Cecilia Kwok, who is pursuing a psychiatry specialty at National Healthcare Group's Institute of Mental Health, has also found her residency to be a period of personal development. "I have broken many personal records: working long hours and late shifts, sometimes working days consecutive days without a break; getting by an entire day on just short breaks and snacks... but my experience has taught me that the human body is infinitely adaptable and can endure a lot. I see this not only in myself but daily in my patients." Her residency, its hectic pace, emotional and physical toll aside, has been satisfying. "Cheesy as it sounds, what makes my day is my patients or their families thanking me and feeling that I made a difference. This makes up for the countless demands that beset the life of resident."



*Dr. Cecilia Kwok and Dr. Ng Eng Hen, during the graduation celebration event in May 2011*

## Residencies in Singapore

Residency training is rolled out across all healthcare clusters in Singapore so that graduates are exposed to six core competencies: patient care; medical knowledge; practice-based learning and improvement; interpersonal and communication skills; professionalism; and systems-based practice. Formative training will lead to more specialists in 3 to 5 years compared to 7 to 8 years previously.

## Where are Duke-NUS graduates posted for residency in Singapore?

### 1) SingHealth Residency Program

Most graduates are placed with SingHealth, the largest sponsoring institution for the Residency Program in Singapore. In May 2010, 8 Programs were launched and 63 residents have gone through them to date. In 2011, 6 new Programs were added and SingHealth welcomed 200 new residents. SingHealth has added a seventh competency – faculty development – to equip residents with leadership, administrative and pedagogy skills.

<http://www.singhealth.com.sg/SingHealthResidency>

### 2) National Healthcare Group - The National Psychiatry Residency Program

Duke-NUS graduates pursuing a psychiatry speciality undergo the five-year National Healthcare Group program in mental health. It trains psychiatrists to manage a wide range of psychiatric conditions and residents have the opportunity to work in a variety of mental health settings across Singapore.

<http://www.nhgresidencyprogram.com.sg/Programs/psychiatry.aspx?id=143>



To find out more about Duke-NUS' M.D program and to apply, [click here](#).

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## Duke-NUS to lead diabetes research with new metabolomics platform

*As cardiovascular and metabolic diseases see a worrying rise in Asia and throughout the world, Duke-NUS is focusing research in this area and on a new metabolomics platform, one of the first in South-east Asia.*

### Duke-NUS Metabolomics Facility



*The gas chromatography-mass spectrometer separates volatile compound mixtures then detects the compounds by creating a mass spectrum of each compound.*



*The triple quadrupole liquid chromatography-mass spectrometer separates compound mixtures, which are then used to analyze more polar compounds.*

One in ten Singaporeans suffers from diabetes. With the burden of cardiovascular and metabolic diseases rising, research on the causes and treatments for related diseases such as hypertension, hardening of arteries and diabetes has become a matter of urgency and an area of emphasis for Duke-NUS, given its expertise.

“In Asia and Singapore, there is an extremely high incidence of metabolic syndrome, diabetes, high blood pressure, cholesterol problems and cardiovascular disease. These health problems, if not well managed, cause substantial death and disability,” observed Dr. Thomas Coffman, Director of the Duke-NUS Cardiovascular and Metabolic Disorders (CVMD) program. Apart from the suffering associated with these disorders, he noted that the management of these conditions poses a major resource burden on the healthcare system.

But Dr. Coffman noted that despite the high incidence of these diseases, there are significant

gaps in knowledge. It is not clear, for example what the interrelationships are between these diseases and what mechanism causes the increased risk of stroke, cardiovascular disease, kidney disease and heart attack. “The Duke-NUS CVMD program strives to unravel the molecular causes of these disorders in order to identify critical pathways through which metabolic disorders promote cardiovascular disease.”



*Dr. Thomas Coffman*

### **Bringing together top minds**

According to Dr. Coffman, the long-term goal is to bring together top translational researchers who study the interactions between metabolic disorders and cardiovascular diseases, and work on discoveries that impact clinical care. “By working in close proximity and as a cohesive group, creative synergy and cross-disciplinary approaches will be promoted,” he said. Already, the CVMD program works closely with the National Heart Centre Singapore (NHCS) and the Duke Cardiovascular Research Center (CVRC) in the United States. Going forward, Duke-NUS also hopes to explore more joint appointments at both Duke-NUS and NHCS. Another platform to build collaboration and drive research in the area is the Goh Cardiovascular Research Award (see box).

### **Welcoming talent**

To boost expertise in the area, the CVMD program welcomed Dr. David Silver in January 2012. Dr. Silver’s interest in lipid biochemistry, physiology and cardiovascular disease led him to make a major advance about how the body stores fat. Dr. Silver discovered a type of proteins (fat storage-inducing transmembrane or FIT proteins), determined their biochemical functions and uncovered how they impact on cholesterol problems. His work in understanding the physiological roles of FIT proteins holds promise for identifying novel drugs to treat obesity-associated diseases.



*Dr. David Silver*

### **Tackling the diabetes scourge**

Because diabetes is escalating in the population at such a rapid rate, research has to be accelerated, said Dr. Shirish Shenolikar, Senior Associate Dean for Research. “The rate of rise in diabetes cannot be attributed to just genetics but also environment and lifestyle factors, which are driving up the risks and causes of the disease.” He added, “Obesity in the Asian context has a much lower body mass index (BMI) compared with the West. Perhaps there are different mechanisms involved in Asia; how we develop drugs in the Western world may not be sufficiently efficient.” To look into the underlying mechanisms (in both molecular and translational research

aspects) of diabetes, Duke-NUS has rolled out a dedicated metabolomics platform that will catalyze research and advance diabetes-focused research in Singapore.



*Dr. Shirish Shenolikar*

### **Building new platforms for research**

Taking diabetes research to greater heights will be a new metabolomics platform, said Dr. Shenolikar. Just as genomics maps genomes and studies their relation to diseases and traits, the study of metabolomics is the study of metabolites – molecules in the body that are produced by the metabolism of different nutrients (the energy-giving chemical reactions in cells).



*Dr. Scott Summers*

Dr. Scott Summers, Associate Professor in the CMVD program, who is heading the metabolomics facility, explained that the coordinated control of a body's energy stores is disrupted in those with metabolic disease. For example, in a diabetic, the body loses its ability to optimally store proteins and fats, increasing the risk for developing cardiomyopathy (disease of the heart muscle), hypertension (high blood pressure), and atherosclerosis (hardening of arteries). "The metabolomics facility will improve our ability to conduct studies of how disruptions in metabolism contribute to disease. We believe that this will lead to a better understanding of disease pathogenesis (how disease is caused) and more importantly, the development of new treatments," said Dr. Summers. All this will be complemented by the research expertise existing in the CVMD program, the existing lipidomics (study of pathways and networks of cellular lipids in biological systems) platform at NUS, the Sarah W. Stedman Nutrition & Metabolism Center in the U.S. and the capabilities of Duke-NUS investigators to do basic clinical chemistry and perform metabolic profiling in humans and disease models. He added, "Duke-NUS will be able to provide a comprehensive analysis of the metabolic status of cells, model organisms, and people. This empowers us to advance discovery in this important disease."

Said Dr. Shenolikar, "The metabolomics platform will help us complete the puzzle by overlaying metabolic profiling data with genomic studies. This will give us a rich fingerprint about disease and will boost translational research – research that moves basic discoveries into new treatments that improve the lives of patients."



To boost CVMD research, the Tanoto Foundation and the Goh Foundation have lent their support to these studies:

### **The Tanoto Foundation initiative for Diabetes Research**

The Tanoto Foundation initiative for Diabetes Research has supported two studies thus far, as of Jan 2012:

- Dr. Wong Tien Yin's study, "An Automated Computer Imaging Program for Diabetes Retinopathy (DR) Detection and Screening", an automated computer imaging program for DR detection and screening. The project aims to reduce physician workload and increase the efficiency of DR screening to reduce costs.
- A study by Dr. Lee Kheng Hock, titled "The Effect of 90-day Oral Testosterone Therapy in Men with Type 2 Diabetes: OTeST", determines whether testosterone supplements improves control of blood sugar, insulin resistance, and other metabolic diseases such as obesity and cholesterol problems in Singaporean Chinese males with Type 2 diabetes mellitus. This project also lays the foundation for future research and clinical trials.

### **The Goh Foundation**

This is a selection of some cardiovascular research studies that the Goh Foundation is supporting:

- A study by Dr. Reginald Liew on how to better detect genetic abnormalities in the heart that cause sudden cardiac death, called "Functional Cardiomyocytes Derived from Patient-Specific Induced Pluripotent Stem Cells as a Novel Cellular Model for Studying Inherited Arrhythmogenic Diseases" attempts to use hair or skin samples to produce special cells called induced-pluripotent stem (iPS) that will be re-programmed into functional heart cells.
- Dr. Tan Swee Yaw's "Comparative Diagnostic and Prognostic Value of CT Angiography and Myocardial Perfusion Imaging" that compares the diagnostic accuracy of myocardial perfusion imaging (MPI) and computed tomography angiography (CTA) in detecting coronary heart disease (narrowing of heart arteries).
- A project that determines the statistical risk of death for those who suffer a heart attack in an Asian population. The "In-hospital and 30-day Mortality from Acute Myocardial Infarction in a Multi-ethnic Asian Population" study by Dr. Bimal Shah seeks to predict a more accurate model of risk specific to Singapore as this objective quantification of in-hospital mortality risk at the time of admission may facilitate individualized care and the appropriate allocation of healthcare resources.

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## Medical students with the heart of a servant leader

For Duke-NUS students and alumni, service to the community and the less fortunate is an intrinsic part of their ethos and all part of the school spirit.

Despite the rigors of the curriculum and the long hours spent in clerkships and research, Duke-NUS students nevertheless set aside time and energy to give back to others. As Prof. Bob Kamei, Vice-Dean of Education noted, the idea of service to others is embedded throughout the school's four-year curriculum. "Our students are not only academically talented individuals; they are also committed to community service. Physicians must not only be excellent in their clinical skills, it is important for them to also have the heart of a servant leader."

Underscoring this, is a myriad of local and overseas community service projects.

### Project KAREn: Duke-NUS' flagship community service project



*Project KAREn 2011*

Project KAREn is the first Duke-NUS student-led community service project initiated in 2010. The annual project is a free comprehensive medical screening for the minority Karen tribe in the remote hills of Chiang Mai who have limited access to medical resources. According to Duke-NUS alumnus, Dr. Ee Tat Xin, who pioneered the project, "The aim was to help bridge the geographical and financial gaps and bring healthcare to them." The experience underscored the importance of the human touch and the power of compassion, he said, "I realized that as doctors, 'healing' may not even

involve medicine, but also listening to them and giving them the attention they do not usually get." One villager who suffered from back pain that turned out to be a mild sprain was grateful simply for the attention she received, recalled Tat Xin. "She trekked a few kilometers in the dark later that night just to thank us."

Since then, Duke-NUS students have pledged to make Project KAREn an annual commitment. In April 2011, a team of Duke-NUS students were back in Chiang Mai and screened some 120 villagers, treated hair lice, conducted dental checks and basic first-aid and referred villagers to a local Thai hospital for treatment of advanced medical conditions.

### World Autism Day

World Autism Day (WAD) was a project initiated by the Benjamin Sheares College, said College Master, Dr. Paul Yen, "after learning that such an event has never been marked at a national level". To heighten awareness of autism and recognize its impact on the lives of autistic

individuals and their families, the College organized a seminar in April 2011 that featured prominent autism experts and educators. Being part of WAD as an organizer gave participants a deeper understanding of the various facets of the disorder. "What was most impactful was the understanding of the profound effects of Autism Spectrum Disorder on the entire family. We saw the importance of paying more attention to the plight of families be it in clinical practice, research or in the policy-making arena," said Joshua Chua, college representative from the class of 2014. The college intends to sustain the effort and do the same in 2012.



## Batam Health Screening

The annual Batam health screening project, supported by the Citramas Foundation, started in 2010, with the aim of providing free health checks for children under 12 in rural Batam, Indonesia. During the two-day September 2011 health screening, 1,700 children were checked by 17 Duke-NUS students who, under the supervision of doctors, collected patient biodata and assisted in running specialist clinics.



*Students with Citramas staff during Batam health screening project 2011.*

Andrew Green, team leader for the Duke-NUS Batam Pediatric Health Screening 2011, was keen to extend the program. "We hope to go on a reconnaissance trip to other Batam villages to further understand the needs of the people."

Esther Chang, the Year 4 Community Service Vice-president, who was also part of the project, felt it was meaningful to "set aside time for the important things in life". She added, "I am glad to contribute in a small way ... I think it is good to be motivated to do something that is beneficial to someone and not for something in return."

## Camp Simba

Bringing joy to children whose family members are afflicted by cancer, Camp Simba (Swahili for 'courage') is a joint community outreach program with the Yong Loo Lin School of Medicine, initiated by Duke-NUS student Sally Ong.

Held annually since 2009, the Camp has been successful and well-received.

In June 2011, the third Camp Simba was held over three days and consisted of fun activities that ranged from art and craft workshops to a scavenger hunt and beach games, much to the delight of the 50 children who participated.

For their compassion and hard work, the

## Regular community engagement

Apart from annual projects, Duke-NUS students actively engage the community through regular health screenings in housing estates and make visits to hospitals during festive occasions.



*Trick or Treat at KKH on 22 Oct 2011*

team behind Camp Simba 2011 was commended under the Community Projects category in the 2011 NUS Student Achievement Awards.



*Visiting Bright Vision Hospital on Hari Raya Puasa 30 Aug 2011*

## Duke-NUS faculty and staff do their part



*Deans' Pancake Breakfast on 25 Nov 2011*

One of the school's signature fundraising events is the annual Deans' Pancake Breakfast. This initiative brings faculty and staff together to raise funds to help subsidize some of the costs of the students' community service projects. Eric Cher, Vice-president of Community Service in the Student Council, explained that proceeds go to the Duke-NUS Community Service Projects Fund to defray the cost of supplies for health screenings and educational programs.

Dr. Craig Stenberg, Associate Dean of Admissions & Student Affairs said, "Our pancake breakfast event in 2011 raised even more money than in previous years. It was not only an event to enjoy delicious pancakes; the total raised this year exceeded S\$4,000, which will be put to very good use as our students, supported by our faculty, give back to the society through community service." After all, service to others is one of the main tenets of medicine and a means of bringing comfort to others.

Dr. Craig Stenberg, Associate Dean of Admissions & Student Affairs said, "Our pancake

## Help our students help others by supporting the Duke-NUS Community Service Projects Fund

More than half of our students volunteer for local and regional community outreach projects despite their rigorous academic schedules. You can help nurture and empower our students in their endeavors to serve the community.

Your gift to the Duke-NUS Community Service Projects Fund helps students participate in community projects and develop their servant leadership skills.

Please contact [development@duke-nus.edu.sg](mailto:development@duke-nus.edu.sg) or Tel: +65 6516 6696 to make this happen or visit <http://www.duke-nus.edu.sg/web/giving-duke-nus/ways-give> to find out more about giving to Duke-NUS.

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## Making a difference with Medtech

Combining mechanical 'bodies', computer 'brains' and a medical 'soul' in an integrated device to diagnose, monitor or treat diseases, medical technologies or medtech is a rapidly growing industry that leverages expertise in engineering, manufacturing and the biomedical sciences.

Dr. Tan Sze Wee, Program Director, Healthcare and Lifestyle Program, A\*STAR, has been key in the establishment of the medtech interest group at Duke-NUS. Said Dr. Tan, "About one-third of Duke-NUS students hold a bachelor's degree in engineering. We would like to continue to fuel and foster their interest in medtech, possibly creating a pipeline of future clinician-engineers in medical device development for Singapore."

Wijaya Martanto and An Jingzhi are the President and Vice-President, respectively, of the medtech interest group. Coupled with their prior knowledge in engineering, Wijaya and Jingzhi hope to use their newfound medical knowledge to make a difference in the field of medtech. Here they are in conversation, talking about their 'medtech mania'.



*Wijaya Martanto (President) and An Jingzhi (Vice-President), of Duke-NUS' medtech interest group talk about their 'medtech mania'.*

**Wijaya: What led you to pursue medical technology? I remember that I was crazy about remote-controlled planes when I was 16 years old. I guess that was the first indication I was interested in what technology can do. What about you?**

**Jingzhi:** (Laughs) I'm not one of those people who can effortlessly disassemble a gadget and put it back together. I am more of a dreamer. I like to imagine how the future can be made better with the available resources. I look forward to pursuing ideas and overcoming technical challenges.

One of my main inspirations was hearing David Constantine speak at the Engineers without Borders Conference on global healthcare held in London in 2010. He is wheelchair-bound and the founder of Motivation, an organization that makes and sends wheelchairs to developing countries.

He shared a powerful anecdote: One of his African wheelchair recipients confronted the wheelchair donor and asked, "Why are you making chairs that are killing my friends?" It turned out that the USD\$150 donated wheelchairs were made of plastic, lacking footpads or cushions, making them dangerous and unusable in the rural terrain. This underscored the importance of design thinking and was a user- and need-centered way of approaching problems. What fundamentally drives the advances in medicine and better care is not just technology but user-centric technology.

**Jingzhi: On the topic of usability and better patient care, tell me more about the groundbreaking medical patent you have been involved in.**

**Wijaya:** Well, I was involved in microneedle research at the Georgia Institute of Technology, where I was pursuing my PhD. Our team of three successfully patented a technology that allows the painless delivery of drugs through microneedles that are deep enough to allow capillary uptake, but short enough to avoid nerve endings, minimizing pain. It was exhilarating to have been involved in securing a patent!

After all, one of my biggest heroes, Prof. Robert Langer, is a prolific inventor with some 800 patents to his name! I first heard about Prof. Langer while pursuing my PhD. Prof. Langer is a chemical engineer who won the Millennium Technology Prize, the world's biggest innovation award and the Charles Stark Draper Prize, a Nobel prize equivalent in Engineering. His research lab is probably one of the biggest academic labs in the world under a single principal investigator, with people of different and diverse backgrounds, a value that Duke-NUS also embraces. I feel it's required these days to develop medical technology successfully, that we bring together the ideas from multidisciplinary fields.

**Wijaya: How about you? Who is your role model?**

**Jingzhi:** Hmm...one of my heroes is Roger Armour, the inventor of the lens free ophthalmoscope, a simple and elegant invention that costs less than S\$4 to make. I had the pleasure of meeting him at the Technology in Medicine and Surgery Conference while I was at Imperial College. I guess our experiences sparked an interest for medtech and I'm glad we have this interest group to keep the passion going.

**Jingzhi: Looking back, the interest group has come a long way since 2010!**

**Wijaya:** Yes, in a way. I remember it all started during a dialogue session with Dr. Tan Sze Wei, our deans and some of the students with engineering backgrounds. Dr. Tan later introduced some speakers to talk with the Duke-NUS student body. We've had the opportunity to meet and network with entrepreneurs, surgeons, inventors and directors of biomedical engineering companies.

**Wijaya: Actually, we've had some great sessions so far. What were some of your favorite activities?**

**Jingzhi:** I have liked all of them, from our regular meetings with fellow students to dialogues with organizers, doctors from SGH, A\*STAR, and the Singapore Stanford Biodesign Program fellows. Our Google Group called The MedTech Connection has also been a great way to keep everyone in the loop of what's happening. It is such a privilege to receive small roundtable coaching from the industry leaders who are so passionate and successful with what they do. I like how it's not just about technicalities but the whole spectrum; we talk about the process from ideation to commercialization.

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*Prof Soo receiving the PSTM 2011 award from President Dr Tony Tan (Photo: A\*STAR)*

## Professor Soo Khee Chee awarded President's Science & Technology Medal 2011

The President's Science and Technology Awards (PSTA) 2011 recognized eight outstanding research scientists and engineers in Singapore, four of whom are from NUS.

Duke-NUS Vice Dean of Clinical and Faculty Affairs Prof. Soo Khee Chee received the prestigious President's Science and Technology Medal (PSTM) 2011, the top honor among these

national awards.

He is the first clinician-scientist to be awarded the PSTM. Past winners included Nobel Laureate in Physiology or Medicine Dr. Sydney Brenner, former Chief Defense Scientist Prof. Lui Pao Chuen and NUS President Prof Tan Chorh Chuan. Said Prof Soo, "I am honored to receive the award. It is a recognition of the importance of both multidisciplinary team effort in science and also the role of clinician scientists in our biomedical sciences initiatives."

Singapore President Dr. Tony Tan Keng Yam conferred the awards to the eight PSTA winners at a grand ceremony held on 8 November 2011.

The event also saw the presentation of the Young Scientist Award (YSA) to three promising research scientists and engineers aged 35 years and below, two of whom are from NUS.

*Article extracted from NUS Newshub, Nov 9, 2011*

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## National Strategy for Palliative Care

The Lien Centre for Palliative Care (LCPC) at Duke-NUS has been commissioned by the Ministry of Health (MOH) to formulate a National

Strategy for Palliative Care in consultation with several major local healthcare key stakeholders.

This comes as Singapore evolves its healthcare system to meet more comprehensively and holistically the needs of an ageing population. As society matures, long-term and end-of-life care becomes the next area of focus. The LCPC, which trains palliative healthcare professionals, has a vision of building a pool of expertise in palliative care. The LCPC also undertakes research on the needs and cultural differences related to death and dying – valuable information that informs policy-making and training.

Another key aim is to raise the public awareness about the importance of palliative care and study how to better integrate services.

As part of the National Strategy for Palliative Care, a workgroup has been appointed. It comprises healthcare professionals from restructured hospitals, hospices, home care, the Agency for Integrated Care (AIC) and representatives from MOH. The Workgroup will look into:

- The holistic detailing of the palliative care needs in Singapore including pain relief, symptom control, psycho-social support and bereavement needs;
- A systematic review of previous and current palliative care services and an analysis of the strengths and weaknesses of the sector;
- A comparison of Singapore's organization of services with that of top-tier countries such as the United Kingdom and Australia; and
- Developing recommendations and the attendant rationale for the organization of palliative care services in the various echelons of healthcare from the home to the hospital. These recommendations will emphasize the sustainability of services and the use of non-palliative care specialists and physician substitutes.

The findings and recommendations are summarized in this [report](#).

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## Frontiers in Translational Science

Jointly organized by Duke-NUS, Duke Medicine and SingHealth, the symposium on "Frontiers in Translational Science: From Preclinical to Clinical Investigation" was held on the Duke-NUS Campus from 10 to 12 October 2011.

Co-chaired by Prof. Patrick Casey of Duke-NUS, Assoc Prof. John Sundry of Duke University Medical Center and Dr. Darren Lim of SingHealth, the symposium focused on translational medicine with a particular focus on the application of advances in cellular and molecular biology and genetics to human investigation.

The symposium provided a vibrant and interactive platform for investigators from Singapore and Duke University Medical Center to discuss their latest research. It also facilitated interaction and collaboration to advance the development application and commercialization of translational medicine for all partners.

The three-day event was well-attended by 250 researchers and students from the local biomedical research community. A total of 26 invited speakers from Duke-NUS, Duke University Medical Center, National Institute of Mental Health (USA), local healthcare and research



institutions, as well as the pharmaceutical industry, shared their expertise and insights. The keynote speakers were Prof. Mary Klotman, Chair of Medicine, and Prof. Yuan-Tsong Chen from the Department of Pediatrics, from Duke Medicine.

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*Duke-NUS student Zhu Meng from MS1 receiving the scholarship from Prof Tan Ser Kiat, former Group CEO of SingHealth (Photo: SingHealth)*

## Our SingHealth Medicine scholars

SingHealth is pleased to award four Duke-NUS students – Zhu Meng, Fong Sheng, Zhu Guili and Darius Aw Kang Lie – with medical scholarships.

Darius Aw from MS2, found his calling in medicine through volunteering with organizations such as the Singapore Heart Foundation. His work there gave him the chance to go door-to-door in housing estates, engaging residents and advocating heart disease prevention.

Darius, who holds a bachelors degree in bioengineering from NTU, said, "Becoming a medical doctor is an extension of my passion to serve the community as I will be equipped with practical skills and medical knowledge to help patients. Thank you SingHealth for supporting me on my journey to becoming a medical doctor."

Another scholarship recipient, Zhu Guili from MS2, said that the recognition from the award has spurred her to greater heights. Guili obtain her bachelor degree in Life Sciences from NUS and worked as a research officer in the Institute of Medical Biology, Singapore, prior to embarking on her medical studies with Duke-NUS.

"I know that the best way for me to make an impact on the lives of many is to become a doctor and serve patients from all walks of life. Initially, I was concerned about making ends meet when I decided to pursue medicine. Now my fears are allayed as the scholarship has made it possible for me to fully focus on my medical training. I look forward to joining SingHealth as a full-fledged clinician when I graduate."

The students received their awards on 28 September 2011 at the SingHealth Best Junior Doctors & Medicine Scholarship Awards Night 2011.

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*Students deep in discussion during a TeamLEAD session*

## Learning Initiatives from Duke-NUS

A gamut of learning initiatives have been rolled out in the past months to drive innovation, boost expertise and build platforms for knowledge sharing and excellence.

### Education Symposium (30 January to 1 February)

Educators from Duke and Duke-NUS will come together to explore mutual innovations in medical education, curricular and research collaboration opportunities during a three-day Duke-NUS

Education Symposium to be held from 30 January to 1 February 2012.

Keynote speaker Dr. Darrell G. Kirch, President and CEO, Association of American Medical Colleges, and eminent presenters will explore the value and importance of innovation, collaboration and research.

### **Duke-NUS launches TeamLEAD fellowship program**

Duke-NUS' signature Team-Based Learning (TBL) or TeamLEAD curriculum - which has earned the interest of educators the world over – will now reach more people, thanks to the launch of the first fellowship program in Singapore on TBL.

Rolled out by Duke-NUS' Medical Education, Research & Evaluation (MERE) department, the TeamLEAD fellowship program will be used to expose more students to the benefits of this pedagogical approach.

Said Dr. Sandy Cook, Senior Associate Dean, Curriculum Development, "Our staff have been travelling to deliver TeamLEAD workshops in countries such as Taiwan, Cambodia, Indonesia and Africa. The Duke Medical School has also adopted the TeamLEAD approach in pilot programs for its first-year medical students in the Brain and Behavior, Molecules and Cells, and Body and Diseases courses." She added, "The fellowship will be the most efficient way to share our expertise, and where participants can experience and see TeamLEAD in action, right here in Duke-NUS." The aim is to grow a community of TBL practitioners and researchers who can enhance the delivery and expand the scholarly work in this technique in education. Dr. Cook hopes to develop and inspire fellowship graduates to become future faculty through "train-the-trainer" programs, thus building a regional cadre of TBL faculty.

Applications for the fellowship have started and will close 25 February 2012. To find out more about the program, visit: <http://www.duke-nus.edu.sg/web/education/faculty-development/fellowship-team-based-learning-tbl>.

Find out more on Duke-NUS' innovative TeamLEAD in this [video](#).

### **Singapore Medical Education Research Forum**

Since 2008, Duke-NUS has been organizing the Singapore Medical Education Research Forum (SMERF) to bring together the educational research community of Duke-NUS and SingHealth. The platform has been invaluable in building a network of supportive and experienced educational researchers. During the forum, our faculty will brainstorm on educational research ideas, get research design and statistical support, receive feedback on abstracts, papers and presentations, discuss the ongoing projects in medical education as well as new ones. All this support both Duke-NUS and SingHealth's Academic Medicine thrust.

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*Mr. Wagoner trying out an attention-interface program while Dean Ranga Krishnan looks on*

## **Duke Board of Trustees visit Duke-NUS**

G. Richard Wagoner, chairman of Duke University Board of Trustees, dropped by Duke-NUS on 27 October 2011. Mr. Wagoner was given a briefing on the school's progress and achievements before touring the facilities. He also met third-year M.D. student Ms. Cheryl Lin, a Duke alumna, and participated in a demonstration of an attention-interface program, which was



*(From left) Dr. Patrick Casey, Mr. David Rubenstein, Dr. Ranga Krishnan and Mr. David Tung*

jointly developed by a team from Duke-NUS' Neuroscience & Behavioral Disorders research program and the Agency for Science, Technology & Research (A\*STAR).

Mr. David Rubenstein, Vice Chairman of the Duke University's Board of Trustees also visited our school on 11 Nov 2011. David M. Rubenstein was elected to the Duke University Board of Trustees in 2003 and is a Co-Founder and Managing Director of The Carlyle Group, one of the world's largest private equity firms.

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## Overseas delegates



*Visitors from the University Medical Centre of Utrecht and the Netherlands Embassy on 16 Dec 2011*



*Visitors from Al Maktoum Academic Medical Center and Mr. Nart Mamser (third from left), the Advisor for Healthcare of Dubai on 10 Oct 2011*

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*Course facilitators Dr. Christopher Asplund and Dr. Sarada Bulchand, post-doctoral researchers at Duke-NUS*

## Grooming NUS pre-medical scholars

Post-doctoral researchers and the Education team at Duke-NUS are collaborating with NUS Pre-Health advisors to guide and counsel selected NUS undergraduates. This is part of a recently developed Pre-Medical (Pre-Med) track to help the undergraduates prepare for entry into a graduate-entry medical program, such as the one at Duke-NUS.

NUS Pre-Med Scholars took the seminar, "Transforming Medicine: From bench to bedside and beyond", conducted by Dr. Christopher Asplund, Dr. Sarada Bulchand and a team of 12 post-doctoral researchers from various Duke-NUS Signature Research Programs.



*Poster presentation on 10 Nov 2011*

The post-doctoral researchers facilitated in-depth discussions of each signature research program in a “TeamLEAD Lite” teaching style.

To prepare for this Pre-Med track, Drs. Bulchand and Asplund worked closely with the Education team to incorporate key components such as group-based learning and facilitated discussion. This not only helped participants think critically and take an informed stand on specific issues and topics, but also gave them an opportunity to experience team-based learning.

Adrian Ng Chang Zhi, a second-year Life Science major, was fascinated by the variety of topics and the method of learning. He said, “I was very engaged and always looked forward to the next lesson. My in-class learning was maximized as we would read the materials online beforehand, which we could discuss and ask questions.”

The course culminated with a poster presentation by the NUS undergraduates in Duke-NUS. One of the attendees, Dr. Mara McAdams, Medical Director of Clinical Performance Center, saw the poster presentation as a “novel way” to engage students in the research process and have them think creatively about a research study and imagine the results and conclusions. She said, “The students were excited and keen to explain their study designs. Having the poster session gave them the experience of presenting their ideas clearly.”

On the experience of mentoring the undergraduates, Dr. Bulchand said, “I had an extremely fulfilling experience. It was challenging to juggle between our research commitments and the delivery of this course. For Dr. Asplund, it was a thrill to see students taking so much away in the process. “Many of them are now more curious and excited about biomedical research, an outcome we wanted to see.”

This semester will be the third time that the seminar will be offered to NUS undergraduates. Dr. Melissa Fullwood and Dr. Laura Gray were the first course coordinators in the second year.

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RESEARCH NEWS

- Research shows that the influenza A virus does not originate from Asia
- Understanding dengue transmission and mosquitoes
- Prof. Mariano Garcia-Blanco made AAAS Fellow

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*(From left) Co-authors Dr. Justin Bahl and Dr. Gavin James Smith*

## Research shows that the influenza A virus does not originate from Asia

A study by researchers at Duke-NUS has dispelled a common belief that influenza A viruses originate from Eastern and Southeast Asia.

The study, which involved an international team of scientists, found that any urban center in the world is just as likely to act as a source for an epidemic. Dr. Gavin Smith, senior author and associate professor in the Duke-NUS Program in

Emerging Infectious Diseases elaborated, "We found that these regions are just one node in a network of urban centers connected by air travel, through which flu virus circulates and causes a series of local epidemics that overlap in time." This means viruses move constantly between populations causing epidemics which overlap in time when the conditions are suitable. During the study, the research team looked at some 1,200 viruses from seven different locations and sequenced 105 new viruses.

According to Dr. Smith, the study will help generate a better understanding of how the virus moves through human populations. "This in turn can lead to better virus control through the development of region-specific vaccine strategies by incorporating knowledge of virus migration and connections between regions," he said. "Current strategies for the control of influenza by vaccination are based on the biannual selection of vaccine candidates for the Northern and Southern hemispheres and require an understanding of genetic and antigenic variants circulating and the potential for new variants to emerge."

Lead author Dr. Justin Bahl added, "While current vaccine-strain selection strategies are generally effective, the results of our study could potentially be used to improve this process by incorporating knowledge of virus migration and connections between regions."

The study was published in November 2011 in the online Proceedings of the National Academy of Sciences Early Edition.

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*Amy Beth Henry removing adult Aedes mosquitoes from a MosquiTrap sticky card.*

## Understanding dengue transmission and mosquitoes

To better understand the patterns of mosquito breeding and its impact on the transmission of the dengue virus in Singapore, Amy Henry, a Research Associate from the Program in Emerging Infectious Diseases has collaborated with the Ministry of Health, National Environment Agency and Ang Mo Kio Town Council on a research project that is the first study in Singapore to use advanced adult mosquito surveillance techniques.

Amy spearheaded the project under the guidance of Dr. Duane Gubler, Dr. Brett Ellis, and Dr. Ooi Eng Eong. The project included deploying 300 mosquito traps to schools, parks, construction sites, residential and commercial areas throughout Ang Mo Kio GRC, with the aim of studying in detail the distribution, abundance and infection status of dengue vectors. The study investigates how dengue is transmitted in a community environment. The data will provide important information that can improve our understanding of dengue transmission dynamics and enhance prevention by directing vector control activities to high risk areas.

The district was chosen as the study area due to the success of the ongoing and complementary Early Dengue Infection and outcome (EDEN) study, which has been taking place in Ang Mo Kio since 2005. EDEN is a collaborative study between Duke-NUS and a number of other Singapore research institutes and government agencies.

Following initial work to establish collaborations to apply for permits, and to write protocols in September 2009, Amy started data collection in July 2010 and her field collection ended in November 2011.

Dengue is resurging in Singapore despite comprehensive vector control programs. Several factors are believed to cause this: the importation of dengue viruses from neighboring countries; lack of immunity against the viruses; an increase in dengue transmission away from the home such as outdoor public areas; and increased reporting of symptomatic dengue, especially in adults.

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*Prof. Mariano Garcia-Blanco*

## Prof. Mariano Garcia-Blanco made AAAS Fellow

Prof. Mariano Garcia-Blanco, from the Duke-NUS Program in Emerging Infectious Diseases, has been given the distinct honor of being elected a fellow of the American Association for the Advancement of Science (AAAS). Election as an AAAS fellow is granted because of scientifically or socially distinguished efforts to advance science or its applications.

Dr. Garcia-Blanco is also professor of medicine and professor of molecular genetics and microbiology at the Duke University Medical Center. He is recognized for his distinguished contributions in RNA biology, and particularly for unraveling the importance of RNA-protein

interactions that regulate messenger RNA splicing and control pathogenic RNA viruses.

In a ceremony to be held in February 2012, 539 members will receive this honor. The AAAS is the world's largest general scientific society and publisher of the journal *Science*, among other journals.

*The article first appeared in <http://www.dukehealth.org>*

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GRANTS AWARDED

- ▶ Cell cycle dependent regulation of telomere elongation by telomerase
- ▶ The calcium sensor STIM: role in synaptic transmission, plasticity and behavior
- ▶ Telomere-dependent and -independent functions of telomerase in cellular response to cisplatin treatment
- ▶ Targeting the purine binding sites, and understanding the protein interactions of the multifunctional dengue virus proteins NS3 and NS5 for discovery and development of novel antivirals
- ▶ Elucidating a novel signaling pathway mediated by mitochondrial ARF and targeting mitochondria by small ARF peptides to overcome apoptosis resistance in cancer
- ▶ The host protein determinants of UPEC infection persistence as biomarkers and therapeutic targets
- ▶ Preferences for end-of-life among cancer patients in Singapore
- ▶ SingaPACE Impact Evaluation: Evidence from a randomized controlled trial

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Details of projects awarded to Duke-NUS researchers from Sep-Dec 2011.

No.	PI	Dept	Project Title (Please click titles for details)	Grant Call	Duration (Months)
1.	Li Shang	CSCB	Cell cycle dependent regulation of telomere elongation by telomerase	MOE Tier 2 Feb 2011	36
2.	Marc Fivaz	NBD	The calcium sensor STIM: role in synaptic transmission, plasticity and behavior	MOE Tier 2 Feb 2011	36
3.	Li Shang	CSCB	Telomere-dependent and -independent functions of telomerase in cellular response to cisplatin treatment	NMRC IRG May 11	36
4.	Subhash Vasudevan	EID	Targeting the purine binding sites, and understanding the protein interactions of the multifunctional dengue virus proteins NS3 and NS5 for discovery and development of novel antivirals	NMRC IRG May 11	36
5.	Koji Itahana	CSCB	Elucidating a novel signaling pathway mediated by mitochondrial ARF and targeting mitochondria by small ARF peptides to overcome apoptosis resistance in cancer	NMRC IRG May 11	36
6.	Bindu Sukumaran	EID	The host protein determinants of UPEC infection persistence as biomarkers and therapeutic targets	NMRC EDG May 11	24
7.	Eric Andrew Finkelstein	HSSR	Preferences for end-of-life among cancer patients in Singapore	Lien Centre for Palliative Care Intramural Award	12



8.	David Bruce Matchar	HSSR	SingaPACE Impact Evaluation: Evidence from a randomized controlled trial	Agency for Integrated Care (AIC) Innovation Fund	24
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**Total Amount of Funding Received for Sept - Dec 2011: S\$6,428,037.54**

## Synopsis

### 1. Cell cycle dependent regulation of telomere elongation by telomerase

Li Shang, Cancer and Stem Cell Biology

In most eukaryotes, the ends of linear chromosomes are capped by telomeres. Telomeres are specialized nucleoprotein structures that consist of tandem DNA repeats bound by telomere-specific binding proteins. Telomeres are essential for both the stability of linear chromosomes and the complete replication of genomic information. Telomere is synthesized by the enzyme-telomerase, a reverse transcriptase whose activity is cell cycle regulated. Telomere elongation by telomerase prevents telomere shortening that will eventually lead to the induction of cellular senescence and the onset of cellular aging. On the other hand, up-regulation of telomerase has been observed in more than 85%-95% of human cancers. This data highlights the critical roles of telomere maintenance by telomerase, as deregulation of telomerase activity can lead to both cancer and early onset of aging. My proposed studies will elucidate the regulation of three key steps in the cell-cycle-dependent telomere elongation by telomerase and the potential functions of cyclin-dependent kinase signaling cascade in these processes in budding yeast. Such cell-cycle-dependent regulatory mechanisms are likely conserved in humans and can provide new insights and targets for anti-cancer therapy as well as for prevention of early onset of aging.

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### 2. The calcium sensor STIM: role in synaptic transmission, plasticity and behavior

Marc Fivaz, Neuroscience & Behavioral Disorders

The human brain contains about 100 billion neurons which are connected through 100 trillion synapses, specialized cellular junctions through which neurons communicate. Excitatory synapses in the central nervous system consist of small membranous protrusions or dendritic spines which receive inputs from presynaptic terminals containing the neurotransmitter release machinery. Synapse formation and modification of synaptic function are thought to represent the fundamental mechanisms governing developmental and experience-dependent changes in brain function. In recent years, it has become clear that the shape and size of dendritic spines are intimately linked to activity-driven changes in synaptic strength. For example, long-term potentiation (LTP), a long-lasting change in synaptic efficacy associated with learning and memory, is accompanied by an increase in spine size. Alterations in spine morphology and synapse number are associated with a range of psychiatric conditions and neurological disorders, including mental retardation, autism, and Alzheimer's disease. Calcium (Ca<sup>2+</sup>) has long been recognized as a central messenger regulating synaptic plasticity and dendritic spine morphogenesis. Changes in Ca<sup>2+</sup> concentration in spines evoked by neuronal activity initiate an array of signalling and transcriptional responses that ultimately modulate synapse spine size and synaptic strength. While the mechanisms regulating Ca<sup>2+</sup> influx into presynaptic terminals and dendritic spines have been extensively studied, much less is known about the contribution of Ca<sup>2+</sup> release from internal stores to synaptic structure and function. Emerging evidence suggests that the intracellular Ca<sup>2+</sup> sensor STIM, a protein residing in the endoplasmic reticulum (ER), regulates neuronal Ca<sup>2+</sup> homeostasis and functional changes in neural circuits. Our preliminary data indicates that STIM is

essential for the formation of dendritic spines in hippocampal neurons, providing a direct connection between ER Ca<sup>2+</sup> signalling and synaptic structure.

The purpose of this proposal is (1) to define the molecular mechanisms underlying STIM function in dendritic spine morphogenesis and synaptic plasticity; and (2) to explore the role of STIM in vivo in modulating neuronal circuits underlying learning and memory, as well as neuropsychiatric dysfunction. We anticipate that this work will reveal a novel signalling mechanism by which information is processed and stored in neuronal circuits and offer alternative therapeutic strategies for neuropsychiatric disorders associated with deranged Ca<sup>2+</sup> signalling and compromised synaptic functions.

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### **3. Telomere-dependent and -independent functions of telomerase in cellular response to cisplatin treatment**

Li Shang, [Cancer and Stem Cell Biology](#)

Chemotherapeutic drug-cisplatin and its analogues are commonly used for treating a wide variety of human cancers, including testicular cancer, bladder cancer, lung cancer and ovarian cancer. While the chemotherapy is usually effective at the beginning, most tumors develop resistance to the chemotherapeutic drug and patients succumb to their disease. Therefore, new therapeutic methods targeting cancers that have become resistant to the existing chemotherapeutic drug is an urgent need. To proliferate continuously, cancer cells reactivate an enzyme called telomerase, which is necessary for the maintenance and replication of linear chromosome in cancer cells. While this enzyme is not expressed in normal human somatic cells, except stem cells and germ cells, its up-regulation has been observed in >85%-90% of human cancers. Therefore, telomerase is an attractive target for cancer therapy. Our preliminary data indicates that inhibition of telomerase activity in cisplatin-resistant ovarian cancer cells resensitizes these cells to cisplatin treatment. Further insights into the potential mechanisms underlying the synergistic suppression of cancer cell growth by inhibition of telomerase and cisplatin treatment both in vitro and in vivo may provide a new therapeutic modality for the treatment of human cancer, especially for the vast majority of patients who develop resistance to cisplatin.

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### **4. Targeting the purine binding sites, and understanding the protein interactions of the multifunctional dengue virus proteins NS3 and NS5 for discovery and development of novel antivirals**

Subhash Vasudevan, [Emerging Infectious Diseases](#)

Dengue virus (DENV) non-structural proteins NS3 and NS5 are essential for virus replication. We want to discover the details of functionally relevant interactions between these proteins and other unknown proteins and test them biochemically or by reverse genetics so that new targets can be identified for therapeutic intervention. Using recombinant proteins expressed in bacteria, insect cells or cell-free expression system, we will develop biochemically tractable interaction assays suitable for testing compound libraries. Peptide phage display, chemical cross-linking, reverse genetics or siRNA gene knockdown strategies will be employed to pin-point the binding partners. A novel chemical-biology approach, which can pull-down NS3 and NS5 from complex infected cell extracts, will form an entirely new platform for discovering novel small molecule inhibitors. Early lead compounds will be tested for efficacy in cell-based infections assays and mouse model for dengue virus infection. DENV infection causes a spectrum of clinical illnesses in nearly 50 million people annually and of these nearly 500000 cases are severe dengue cases that can be fatal. Dengue is a major health concern and threat to Singapore's economy during epidemics. This

research is of high priority as there are no safe preventative vaccines or antiviral treatment currently available for dengue.

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## **5. Elucidating a novel signaling pathway mediated by mitochondrial ARF and targeting mitochondria by small ARF peptides to overcome apoptosis resistance in cancer**

Koji Itahana, [Cancer and Stem Cell Biology](#)

Cancer is the first leading cause of death in many developed countries such as Singapore. One of the major problems of cancer is their acquisition of resistance to chemo- and radiotherapy-induced cell death. However, underlying molecular mechanisms are still poorly understood. It has been recently shown that mitochondria which plays a key role in cell death is one of the promising targets for cancer treatment. We recently found that a tumor suppressor ARF which promotes cell death is localized in mitochondria and impacts on mitochondrial metabolism. During a search for proteins responsible for such ARF functions, we isolated the novel ARF-binding protein which localizes in mitochondria, regulates the mitochondrial metabolism, and contributes to resistant to cell death. In this proposal, we will elucidate the molecular mechanism by which ARF impacts on mitochondrial metabolism and sensitizes cells to death. We will also develop novel small ARF peptides to target mitochondria via the ARF-binding partner to overcome resistance to cell death in cancer. Our research will not only reveal a putative ARF-mediated mitochondrial signaling pathway but also provide a novel cancer treatment which targets mitochondria to improve human health.

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## **6. The host protein determinants of UPEC infection persistence as biomarkers and therapeutic targets**

Bindu Sukumaran, [Emerging Infectious Diseases](#)

Urinary tract infections (UTIs) represent the second most common bacterial infections of mankind and therefore constitute a significant public health problem. Uropathogenic E. coli (UPEC) cause 80% of all UTIs, and are often able to induce recurrent and chronic infections despite appropriate antibiotic therapy. UPEC is known to enter and reside persistently within urinary bladder cells for longer periods of time. However, how UPEC infects and survive within human urinary bladder cells is not known. It is likely UPEC will be exploiting human cellular proteins and signaling pathways to enable its survival within urinary bladder cells and this project aims to discover them. Identifying these host proteins/signaling pathways will reveal the mechanisms used by UPEC to persist within human cells. This will also reveal new therapeutic targets against UPEC infection.

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## **7. Preferences for end-of-life among cancer patients in Singapore**

Eric Andrew Finkelstein, [Health Services & Systems Research](#)

Understanding preferences for care at the end-of-life (EOL) is important for planning and improving services that provide such care. Satisfying the needs of dying patients without unduly burdening the healthcare system is a public health priority; however preferences concerning care at EOL remain largely unknown. This project proposes to field a stated preference conjoint survey to 250 end-stage patients and their caregivers in Singapore in order to understand their preferences for care at EOL.

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## 8. SingaPACE Impact Evaluation: Evidence from a randomised controlled trial

David Bruce Matchar, [Health Services & Systems Research](#)

This is an impact evaluation of the effectiveness of the Singapore Program for All Inclusive Care for the Elderly (SingaPACE) demonstration project. SingaPACE is modelled on the US PACE home and community based service that acts as an alternative to institutional care. The program will provide comprehensive day health center services and home based services; with transportation from the day center to the home as well as from the home to the day center. Using a randomized controlled trail (RCT) design, this project will study the effectiveness of SingaPACE on frail elderly high Category 2 – Category 3 participant health and functional status outcomes; quality of life; and caregiver satisfaction over 36 months compared to the existing intermediate and long term care that the frail elderly receive whereby they are community care or nursing home eligible. This impact evaluation aims to determine how SingaPACE model of health and social care can reduce the use of institutional care and improve the quality of life; and satisfaction of the participants and their caregivers.

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## Appreciation Day for Faculty

Duke-NUS recognized the contributions of clinician-educators at the faculty appreciation award ceremony held on 18 Nov 2011. Award winners were nominated by the medical students. The evening included a sumptuous dinner, tributes by students and the beer chugging challenge which has been a tradition every year. For the first time, each class made a video tribute to honor our faculty and recognize those members who have made impact on them.

Congratulations to the award winners and all who have invested their time in making Duke-NUS a vibrant learning community. Check out the list of awardees in this [Appreciation Awards List](#).



“We all look forward to this event, which features our student’s creative talents expressed as warm and light-hearted appreciation for the faculty. There is no better compliment for the faculty than to be “made fun of” by the students in their videos. Our students depend on faculty to give so much of themselves to teach the next generation of physicians and give back to the profession of medicine. The evening is a great reminder of the dedication of our faculty providing their part in this vital educational tradition in medicine.” – **Prof. Bob Kamei, Vice Dean of Education**



“Each year our students put together a celebration of “Thanks” for the hardworking faculty who have contributed so much to helping the students become the best doctors they can be. While a few get special recognition, all are appreciated and it shows in the videos and congratulatory expressions. My heartiest congratulations to everyone who mentors our students.” – **Prof. Sandy Cook, Senior Associate Dean, Curriculum Development**

“Saying thank you never goes out of style. But, often we neglect to communicate our appreciation in the midst of our busy, stressful lives-even to those who do the very most to help us and care for us. We are making Faculty Appreciation part of Duke-NUS culture, because we are a



community preparing compassionate physicians, physician scientists, and physician leaders of the future. Hopefully, saying 'thank you' in whatever language and in a creative, humorous way will create fond memories that will endure long after we are gone." – **Dr. Craig Stenberg, Associate Dean of Student Affairs and Admissions**

**View gallery:**



Duke-NUS recognized the contributions of clinician-educators at the faculty appreciation award ceremony held on 18 Nov 2011.



(Left) Faculty and students enjoying the spread. (Right) Prof. Tan Ser Kiat, former Group CEO of SingHealth, addresses the crowd.



(Left) Dr. Joshua J Gooley, Outstanding Faculty for Learning (Brain & Behavior); in red tie: Dean Ranga Krishnan. (Right) Dr. Shirish Shenolikar, with students from the class of 2015, Martyn Gostelow and Agnes Chao.



(Left) Dr. Janil Puthuchery, Outstanding Faculty for Advocacy (Body & Disease). (Right) Dr. Mara McAdams, Outstanding Faculty for Engagement (Practice Course); in red tie: Dean Ranga Krishnan.



(Left) Dr. Phua Ghee Chee garners dual accolades – Outstanding Faculty for Learning (Internal Medicine) and Outstanding

Developer for Critical Care. (Right) Dr. Mark Lim Boon Leng, Outstanding Developer for Critical Care; in blue shirt: Prof. Tan Ser Kiat, former Group CEO of SingHealth.



(Left) Dr. Tan Thiam Chye, Outstanding Faculty for Learning (ObGyn); in blue shirt: Prof. Tan Ser Kiat, former Group CEO of SingHealth. (Right) Dr. Kon Oi Lian, Outstanding Faculty for Advocacy (Molecules & Cells); in red tie: Dean Ranga Krishnan.



(Left) Dr. Chia Yin Nin, Outstanding Faculty for Learning (ObGyn); in red tie: Dean Ranga Krishnan (Right) Dr. Toh Han Chong, Outstanding Faculty for Advocacy (Molecules & Cells); in blue shirt: Prof. Tan Ser Kiat, former Group CEO of SingHealth.





(Left) Andrew Chou and Petty Chen (Class of 2015) serenading the crowd. (Right) A toast to our dedicated faculty and mentors.

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**SNAPSHOTS**

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## Faculty appreciation awards list

Categories of Awards - Learn Engage Advocate Develop (LEAD values)

### Nominations by Class of 2014 (Total of 20 awards)

#### Award Title: Outstanding Faculty for Learning

No.	Name & Designation	Award Category
1.	Associate Professor Simon Ong Yew Kuang	Outstanding Faculty for Learning (Practice Course)
2.	Associate Professor Lai Siang Hui	Outstanding Faculty for Learning (Molecules & Cells)
3.	Assistant Professor Soh Chai Rick	Outstanding Faculty for Learning (Normal Body)
4.	Assistant Professor Joshua J Gooley	Outstanding Faculty for Learning (Brain & Behavior)
5.	Professor Doyle Graham	Outstanding Faculty for Learning (Body & Disease)

#### Award Title: Outstanding Faculty for Engagement

No.	Name & Designation	Award Category
1.	Assistant Professor Mara Catherine McAdams	Outstanding Faculty for Engagement (Practice Course)
2.	Assistant Professor William Hwang Ying Khee	Outstanding Faculty for Engagement (Molecules & Cells)
3.	Adjunct Assistant Professor Mark Khoo Li-Chung	Outstanding Faculty for Engagement (Normal Body)
4.	Dr. James Cullen	Outstanding Faculty for Engagement (Brain & Behavior)
5.	Professor Hwang Nian Chih	Outstanding Faculty for Engagement (Body & Disease)

#### Award Title: Outstanding Faculty for Advocacy

No.	Name & Designation	Award Category
1.	Professor Ho Lai Yun	Outstanding Faculty for Advocacy (Practice Course)
2.	Professor Kon Oi Lian	Outstanding Faculty for Advocacy (Molecules & Cells)
3.	Associate Professor Lai Siang Hui	Outstanding Faculty for Advocacy (Normal Body)
4.	Associate Professor Lee Tih-Shih	Outstanding Faculty for Advocacy (Brain & Behavior)
5.	Assistant Professor Charles Albert Gullo	Outstanding Faculty for Advocacy (Body & Disease)

**Award Title: Outstanding Faculty for Development**

No.	Name & Designation	Award Category
1.	Associate Professor Lim Soon Thye	Outstanding Faculty for Advocacy (Practice Course)
2.	Adjunct Assistant Professor Toh Han Chong	Outstanding Faculty for Advocacy (Molecules & Cells)
3.	Professor Pierce Chow	Outstanding Faculty for Advocacy (Normal Body)
4.	Professor Tan Eng King	Outstanding Faculty for Advocacy (Brain & Behavior)
5.	Assistant Professor Janil Arusha Puthucheary	Outstanding Faculty for Advocacy (Body & Disease)

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Categories of Awards - Learn Engage Advocate Develop (LEAD values)

**Nominations by Class of 2013 (Total of 28 awards)**

**Award Title: Outstanding Faculty for Learning**

No.	Name & Designation	Award Category
1.	Adjunct Associate Professor Lim Boon Leng	Outstanding Faculty for Learning (Clinical Core)
2.	Assistant Professor Tan Thiam Chye	Outstanding Faculty for Learning (ObGyn)
3.	Instructor Suzanne Goh Pei Lin	Outstanding Faculty for Learning (Paeds)
4.	Adjunct Associate Professor Tan Seck Guan	Outstanding Faculty for Learning (Surgery)
5.	Adjunct Associate Professor Ng Beng Yeong	Outstanding Faculty for Learning (Psychiatry)
6.	Associate Professor Lo Yew Long	Outstanding Faculty for Learning (Neurology)

7. Adjunct Associate Professor Loo Chian Min Outstanding Faculty for Learning (Internal Medicine)

**Award Title: Outstanding Faculty for Engagement**

No.	Name & Designation	Award Category
1.	Adjunct Associate Professor Ding Yew Yoong	Outstanding Faculty for Learning (Clinical Core)
2.	Adjunct Assistant Professor Arthur Tseng Leng Aun	Outstanding Faculty for Learning (ObGyn)
3.	Adjunct Instructor Lee Khai Pin	Outstanding Faculty for Learning (Paeds)
4.	Professor London Lucien Ooi Peng Jin	Outstanding Faculty for Learning (Surgery)
5.	Adjunct Assistant Professor Sujatha Rao	Outstanding Faculty for Learning (Psychiatry)
6.	Adjunct Associate Professor Loh Ngai Kun	Outstanding Faculty for Learning (Neurology)
7.	Professor Teo Eng Kiong	Outstanding Faculty for Learning (Internal Medicine)

**Award Title: Outstanding Faculty for Advocacy**

No.	Name & Designation	Award Category
1.	Adjunct Associate Professor Ong Biauwei Chi	Outstanding Faculty for Learning (Clinical Core)
2.	Instructor Lim May Li	Outstanding Faculty for Learning (ObGyn)
3.	Associate Professor Loh Tsee Foong	Outstanding Faculty for Learning (Paeds)
4.	Adjunct Assistant Professor Preetha Madhukumar	Outstanding Faculty for Learning (Surgery)
5.	Adjunct Assistant Professor Andrew Peh Lai Huat	Outstanding Faculty for Learning (Psychiatry)
6.	Professor Lim Shih Hui	Outstanding Faculty for Learning (Neurology)
7.	Adjunct Professor Julian Thumboo	Outstanding Faculty for Learning (Internal Medicine)

**Award Title: Outstanding Faculty for Development**

No.	Name & Designation	Award Category
1.	Associate Professor Koo Wen Hsin	Outstanding Faculty for Learning (Clinical Core)
2.	Adjunct Assistant Professor Chia Yin Nin	Outstanding Faculty for Learning (ObGyn)
3.	Dr. Chong Shu Ling	Outstanding Faculty for Learning (Paeds)
4.	Associate Professor Koong Heng Nung	Outstanding Faculty for Learning (Surgery)

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| 5. | Associate Professor Swapna Kamal Verma           | Outstanding Faculty for Learning (Psychiatry)        |
| 6. | Adjunct Associate Professor Thirugnanam Umapathi | Outstanding Faculty for Learning (Neurology)         |
| 7. | Assistant Professor Phua Ghee Chee               | Outstanding Faculty for Learning (Internal Medicine) |

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Categories of Awards - Developer Understanding Knowledgeable Educator (DUKE values)

### **Nominations by Class of 2012 (Total of 31 awards)**

#### **Award Title: Outstanding Developer Award**

No.	Name & Designation	Award Category
1.	Professor John Rush	Outstanding Developer for Research
2.	Associate Professor Lee Kheng Hock	Outstanding Developer for Family Medicine
3.	Adjunct Assistant Professor Goh Yaw Chong	Outstanding Developer for Surgery Sub-Internship
4.	Associate Professor Tan Han Khim	Outstanding Developer for Medicine Sub-Internship
5.	Adjunct Assistant Professor Mark Leong Kwok Fai	Outstanding Developer for Emergency Medicine
6.	Adjunct Associate Professor Mark Lim Boon Leng	Outstanding Developer for Critical Care
7.	Adjunct Assistant Professor Denny Lie Tjiauw Tjoen	Outstanding Developer for MSK
8.	Adjunct Associate Professor Cheah Foong Koon	Outstanding Developer for Radiology elective
9.	Associate Professor Simon Ong Yew Kuang	Outstanding Developer for Medical Oncology elective
10.	Adjunct Assistant Professor Ling Khoon Lin	Outstanding Developer for Gastroenterology elective

#### **Award Title: Most Understanding Faculty Award**

No.	Name & Designation	Award Category
1.	Assistant Professor John Carson Allen Jr	Outstanding Developer for Research
2.	Instructor Rukshini Puvanendran	Outstanding Developer for Family Medicine
3.	Adjunct Assistant Professor Chan Weng Hoong	Outstanding Developer for Surgery Sub-Internship
4.	Adjunct Assistant Professor Ng Yee Sien	Outstanding Developer for Medicine Sub-Internship

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| 5. | Adjunct Professor Venkataraman Anantharaman | Outstanding Developer for Emergency Medicine |
| 6. | Assistant Professor Phua Ghee Chee          | Outstanding Developer for Critical Care      |
| 7. | Adjunct Assistant Professor Ong Yee Siang   | Outstanding Developer for MSK                |

**Award Title: Most Knowledgeable Faculty Award**

No.	Name & Designation	Award Category
1.	Assistant Professor Benjamin Haaland	Outstanding Developer for Research
2.	Associate Professor Lee Kheng Hock	Outstanding Developer for Family Medicine
3.	Adjunct Assistant Professor Tan Hiang Khoon	Outstanding Developer for Surgery Sub-Internship
4.	Adjunct Associate Professor Tan Ban Hock	Outstanding Developer for Medicine Sub-Internship
5.	Adjunct Assistant Professor Jean Lee Mui Hua	Outstanding Developer for Emergency Medicine
6.	Assistant Professor Soh Chai Rick	Outstanding Developer for Critical Care
7.	Adjunct Professor Julian Thumboo	Outstanding Developer for MSK

**Award Title: Outstanding Educator Award**

No.	Name & Designation	Award Category
1.	Dr. Gita Krishnaswamy	Outstanding Developer for Research
2.	Adjunct Instructor Farhad Vasanwala	Outstanding Developer for Family Medicine
3.	Adjunct Professor Christopher Cheng Wai Sam	Outstanding Developer for Surgery Sub-Internship
4.	Dr. Dennis Seow	Outstanding Developer for Medicine Sub-Internship
5.	Adjunct Assistant Professor Evelyn Wong	Outstanding Developer for Emergency Medicine
6.	Dr. Chew Huck Chin	Outstanding Developer for Critical Care
7.	Adjunct Assistant Professor Joyce Koh Suang Bee	Outstanding Developer for MSK

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