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(From left) Prof Boey, Assoc Prof Wong and Prof Venkatraman won the President's Technology Award for their breakthrough in nanomedicine therapy.

New hope for glaucoma patients

Scientists develop innovative way to deliver nanomedicine to the eye that lasts months to replace daily eye drops

BY SUKI LOR

A PASSION to help people with eye illnesses, great teamwork and complementary skills spurred three scientists to devise a novel way to prevent glaucoma patients from going blind and this has won them the President's Technology Award this year.

The team comprises Professors Subbu Venkatraman, and Freddy Boey, and Associate Professor Tina Wong, from Nanyang Technological University's (NTU) School of Materials Science and Engineering. Assoc Prof Wong is also Senior Consultant Ophthalmologist at the Singapore National Eye Centre and Head of the Ocular Therapeutics and Drug Delivery Research group at the Singapore Eye Research Institute.

They set out six years ago to find an alternative to the daily eye drops for glaucoma patients and developed a therapy whereby a simple and painless injection in the eye delivers nanomedicine that is released slowly over several months. It replaces the need to physically apply eye drops every day.

The treatment is expected to be commercially

available in about two years, after larger-scale clinical trials are conducted.

"We are the first team in the world to produce this device using a nano approach and the result speaks for itself," says Prof Boey, an entrepreneur and bioengineer.

"The history of developing products in this particular area of nanomedicine is that it takes about seven to 20 years to do the first human trials for anything related to nano technology in medicine. What we did by not losing focus was to shorten that time to about four-and-a-half years," says Prof Venkatraman, a biomaterials scientist.

"This technology is ground-breaking in that sustained action for several months was demonstrated with a single injection, and this will open the door to the treatment of many other diseases in the future," he adds.

The business model must also work for the project to succeed, says Prof Boey. Patients would be more willing to get an injection in the eye if one dose lasts up to six months.

Publication: TODAY

Title: Researchers honoured for advances in eye treatment

Author: Xue Jianyue

Date: 5 November 2014

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SINGAPORE — One team of researchers found a way of using nanotechnology to release medication into glaucoma sufferers' eyes over a few months, eliminating the need to apply it frequently. Another group created an algorithm designed to recognise eye diseases even before symptoms appear.

In recognition of the medical and economic impact of their work on Singapore, the members of the two teams were among eight research scientists and engineers who were yesterday accorded the President's Science and Technology Awards — the Republic's highest scientific honours.

The President's Technology Award (PTA) was conferred on the two teams by President Tony Tan at a ceremony held at the Istana last night.

Two other individuals also received the President's Science and Technology Medal (PSTM) and the President's Science Award (PSA) in recognition of their scientific work.

PTA recipients Professor Subbu Venkatraman, Associate Professor Tina Wong and Professor Freddy Boey from the Nanyang Technological University (NTU) were recognised for their work in developing a sustained drug-delivery technology to apply the anti-glaucoma medicine.

The medicine is loaded onto tiny particles, or nanoparticles, and delivered as a solution on the eye's surface via painless injections.

The approach overcomes the problem of glaucoma patients skipping their medication and poor drug penetration of eye drops, said the researchers.

The other PTA-winning team comprises Professor Wong Tien Yin from the Singapore National Eye Centre, as well as Professor Wynne Hsu and Professor Lee Mong Li from the National University of Singapore (NUS).

Prof Wong's team developed advanced algorithms to monitor and record subtle changes to the retina over time.

The system is designed to help doctors detect eye diseases early, even before the symptoms appear. Said PTA committee chair Professor Quek Tong Boon of the two award-winning projects: "What differentiated these two teams from the rest is their vision, their demonstrated potential of their work and the potential societal and economic impact of their work."

He added that the technologies can help prevent blindness in glaucoma patients here and also establish Singapore as a leading eye care centre. There are about 70,000 people with glaucoma in the Republic.

National University Health System chief executive John Wong Eu-Li, who was awarded the PSTM, was described by the Agency for Science, Technology and Research (A*STAR) as a pioneer in the Republic's biomedical movement, recruiting top scientists and bringing together academic centres from across Asia to develop treatments suitable for Asian populations.

Professor Loh Kian Ping from the NUS Department of Chemistry, who received the PSA, is a pioneer in graphene chemistry research, contributing significantly to Singapore's position as a world leader in this area, said A*STAR.

Besides the PSTA awards, the Young Scientist Awards were also presented to three promising young research scientists and engineers during last night's ceremony.

They included NTU's Assistant Professor Wang Qijie for his research in photonics and optoelectronics; NTU's Assistant Professor Zhang Baile for his work on invisibility cloaking technology; and NUS Assistant Professor Melissa Jane Fullwood for her research on chromatin interactions — a region in the genome — and how they affect cancer.

Publication: MyPaper

Title: 检测与治疗眼疾取得突破 两团队获颁“总统科技奖”

Author: 林子恒

Date: 5 November 2014

News Content: Neutral

我报 MyPaper



检测与治疗眼疾取得突破 两团队获颁“总统科技奖”

林子恒

本地两支科研团队分别在检测和治疗眼疾方面，取得了突破性研究成果，昨天获颁代表本地最高科技荣誉的“总统科技奖”。这也是首次有两个团队同时获颁这个奖项。

其中一支获奖团队由新加坡眼科研究所所长黄天荫教授，以及新加坡国立大学计算机学院的许为宁教授和李梦莉教授组成。

他们联合研发了新眼部图像检测及评估系统，利用高端眼科图像分析程序，更快速地从眼睛扫描图像探测出患病迹象。据了解，新科技可将检测时间从现有的3星期锐减到1小时。

新技术将分辨各种疾病的方程式输入电脑程序内，病人只需在医院或诊所进行眼睛扫描，再将扫描图像发送到眼科研究所的实验室进行电脑自动分析，就能获取眼科报告。

也是全国眼科中心院长的黄天荫教授说，这项技术由电脑取代专人进行分析工作，意味着更多病人将能以更低廉的费用进行定期检查，减少等候时间及不必要的转诊。

黄天荫说，新加坡中央医院糖尿病中心、竹脚妇幼医院和国大医院都已开始使用这项技术，新加坡保健集团的3家综合诊疗所也有意加入。

另一个获奖的团队则由南洋理工大学材料科学与工程学院的苏卜教授（Subbu Venkatraman）、黄斯伶副教授，以及梅彦昌教授组成。

他们成功研发出世界首款治疗青光眼的纳米眼药水。

科研团队将纳米眼药水的成分装在比尘埃颗粒还小几千倍的脂质体（liposome）中，再将药水无痛地注射入患者眼球里，之后的6个月里，脂质体会不断在眼球内部释放药物。这么一来，病人就无需每天滴眼药水，也不必担心产生副作用。这个新纳米药物预料能在两年内推出市场。

两支团队昨晚在年度总统科学与科技奖颁奖典礼上，从总统陈庆炎博士手中接获总统科技奖。

**国大医学组织首席执行官
获“总统科学与科技奖章”**

另一方面，代表我国最高科学及科技荣誉的“总统科学与科技奖章”，今年颁发给国大医学组织首席执行官黄聿立教授，表扬他在科研及生物医学科学研究方面的卓越贡献，以及他在本地医疗及医学领域所扮演的领导角色。

总统科学奖则由国大理学院化学系的罗健平教授获得，表扬他在石墨烯（graphene）化学领域所进行的卓越研究。

今年，评委一共收获53项提名，最终有8名科学家获得肯定。

聯合早報

检测和治療眼疾方面各有突破性成果 兩團隊同獲“總統科技獎”

总统科技奖评审委员会主席郭忠文教授说，两支获奖团队的科研成果相辅相成，一个能改进检测疾病的工作，另一个则强化疾病治疗。他们的成就，为我国成为眼疾治疗枢纽的愿景开启了新的契机。

林子恆 报道
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南洋理工大学材料科学与工程学院的苏卜教授(右)和黄立教授(左)共同研发出世界首款治疗青光眼的纳米眼药水。(南大提供)

我国眼疾病的发病率高，随着人口老龄化，预料将有更多国人患上眼疾。本地两支科研团队分别在检测和治療眼疾方面，取得了突破性研究成果，昨天获颁由总理颁发的总统科技奖的“总统科技奖”。这也是首次有两个团队同时获颁这个奖项。

其中一支获奖团队由新加坡眼科研究所所长黄天的教授，以及新加坡国立大学计算机学院的李宇教授和李梦菊教授组成。他们联合研发了新型视网膜检测和评估系统，利用高解像度图像分析程序，能快速地检测出视网膜病变的迹象。据了解，新科技可将检测时间从以往的三星期缩短到一小时。

日前，眼科医生已能通过视网膜扫描，判断病人是否患上青光眼和糖尿病视网膜病变等疾病，以及中风、心脏病和糖尿病等血管性疾病。

电脑取代专人进行分析

新技术将分解各种疾病的方式输入电脑程序内，病人只需在医院或诊所进行眼睛扫描，再将扫描图像发送到远程研究所的实验室进行电脑自动分析，就能获取眼科报告。

但是全国眼科中心院长的黄天教授说，这项技术由电脑取代专人进行分析工作，意味着更多病人能获得以更廉价的费用进行定期检查，减轻医生诊所的生产力，减少等候时间及不必要的转诊。

不过他提醒，系统只能准确地检测和评估严重病患及健康人士的族群图像。对于其他病患，系统只能评估出他们的患病风险和迹象，病人还需寻找各自的专科医生做详细的检查以确定病情。

黄天说，新加坡中央医院糖尿病中心、竹脚妇幼医院和国立医院都已开始使用这项技术，新加坡保健集团的三家综合诊疗中心也有意加入。

另一个获奖的团队则由南洋理工大学材料科学与工程学院的苏卜教授(Suhb Venkatesan)、黄那合副教授，以及梅彦昌教授组成。

他们获得新加坡国立研究基金会和眼科研究院拨款支持，成功研发出世界首款治疗青光眼的纳米眼药水。科研团队将纳米眼药水的成分装在比尘埃颗粒还小

几乎仿的脂质体(liposome)中，再经药水无痛地射入患者眼球里，之后的六个月里，脂体会不断在眼内溶解药物。

这样一来，病人无需每天滴眼药水，也不必担心产生副作用。这个新纳米药物预计在四年内推出市场。

苏卜教授说，这项纳米药物技术也适用于心血管和皮肤疾病等，甚至也能用来承载糖尿病患者所需的胰岛素(insulin)。

两支团队昨晚在年度总统科学与科技奖颁奖典礼上，从总统陈庆炎博士手中获颁总统科技奖。

总理公署部长兼内政部长及贸工部第二部长易学仁说，我国致力研发，企业的平均研发投入支从2002年的460万元，增加到2012年的600万元。

其中，私人企业的医疗科技业所投入的研发开支，过去十年里每年增加36.4%，研究人员人数每年也增加18%，2012年达到的300人，当中有八成是本地人。

易学仁说，研究人才是推动我国利用科学与科技发展经济。

总统科技奖评审委员会主席、国防科学部长郭忠文教授说，两支获奖团队的科研成果相辅相成，一个能改进检测疾病的工作，另一个则强化疾病治疗。

他说：“他们的成就，为我国成为眼疾治疗枢纽的愿景开启了新的契机。”

黄立教授获颁总统科学与科技奖章

另一方面，代表我国最高科学及科技荣誉的“总统科学与科技奖章”，今年颁发给国立大学医学组首席执行官黄立教授，表彰他在科研及生物医学科学研究方面的卓越贡献，以及他在本地医疗及医学领域所扮演的领导角色。

总统科学奖章由国立大学理学院化学系的罗健平教授获得，表彰他在石墨烯(graphene)化学领域所进行的卓越研究。

今年评审一共收到53项提名，最终有八名科学家获得肯定。

易学仁昨晚也颁发青年科学家奖给三名35岁以下的科学家。

Publication: The Straits Times
Title: Accolades for work in treating cancer in Asia
Author: Carolyn Khew
Date: 5 November 2014
News Content: Neutral

THE STRAITS TIMES



The President's Science and Technology Awards were given out yesterday to Professor John Eu-Li Wong (centre), Professor Loh Kian Ping (left, with glasses), and two teams, which comprised (from left) Professor Freddy Boey, Professor Subbu Venkatraman, Associate Professor Tina Wang, as well as Professor Wynne Hsu, Professor Lee Mong Li and Professor Wong Tien Yin. -- ST PHOTO: MARK CHEONG

BY CAROLYN KHEW

MORE than a decade ago, Professor John Eu-Li Wong first noticed the "same cancer behaving differently" in Asians and Caucasians while he was studying abroad.

Prof Wong - who last night won a top science award - observed that lung cancer in the United States, for example, was largely a "disease of smokers", with men forming the bulk of its patients. In Singapore, however, a very large number of lung cancer patients were women in their 40s who had never smoked before.

This intrigued Prof Wong, now chief executive of National University Health System, and led him to set up the Cancer Therapeutics Research Group in 1997. "For the last 150 years, we have been importing treatment solutions from the West. What happens if the cancers are different in America and Asia?" said Prof Wong, who co-founded the group.

The group has shown major differences in the expression and treatment of common cancers between Asian and Caucasian populations.

It also brings together academic cancer centres from Singapore, Australia and across Asia to develop better treatments for cancers affecting mainly Asian populations.

For these and other efforts, the oncologist-haematologist was one of eight research scientists and engineers awarded the President's Science and Technology Awards (PSTA) by President Tony Tan Keng Yam at a ceremony held in the Istana yesterday.

"I'm just doing my job... It's a huge team effort," said Prof Wong, who was awarded the President's Science and Technology Medal - the most prestigious award under the PSTA.

Professor Subbu Venkatraman and his team at Nanyang Technological University (NTU) and the Singapore Eye Research Institute (Seri) received the President's Technology Award for developing an anti-glaucoma drug that can be injected into the eye surface. The sustained-release nanomedicine treatment lasts up to six months and is more effective than eye drops, which patients may forget to apply.

"Conventionally, nanomedicine has been aimed mainly at cancer chemotherapy. Demonstrating its utility for treating glaucoma is a huge breakthrough that will also open other doors," said Prof Venkatraman, chair of NTU's School of Materials Science and Engineering.

The technology's development was largely funded by Seri through a Translational Clinical Research Grant from the National Research Foundation.

Professor Wong Tien Yin of Seri and his National University of Singapore (NUS) team won the President's Technology Award for ocular imaging technology used for screening and tracking the progression of diseases such as glaucoma and stroke.

The President's Science Award went to NUS' Professor Loh Kian Ping for research on graphene chemistry.

Three scientists under the age of 35 received the Young Scientist Award: Yale-NUS' Assistant Professor Melissa Jane Fullwood, and NTU's Assistant Professor Wang Qijie and Assistant Professor Zhang Baile.

Prof Zhang, 33, designed an "invisibility cloak" that can make objects and even small animals disappear. He is working to make the cloak omni-directional and to create cloaks for different energy forms like light and heat.

A "world-class talent base" is needed for R&D to flourish, Minister in the Prime Minister's Office S. Iswaran said at yesterday's event. "The depth of Singapore's research talent base has been the key to our ability to tap science, technology and innovation in growing our economy," said Mr Iswaran, who is also Second Minister for Home Affairs and Trade & Industry.

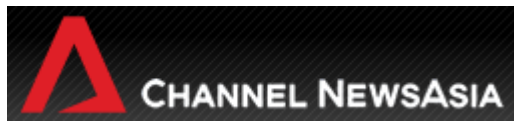
Publication: Channel News Asia

Title: Eight scientists and engineers recognised for R&D contributions

Author: Sharon See

Date: 5 November 2014

News Content: Neutral



SINGAPORE: Eight scientists and engineers were the recipients of the President's Science and Technology Awards at the Istana on Tuesday evening.

The awards are Singapore's highest scientific honours, given to individuals and teams for their contributions to research and development.

The President's Science Award was presented to NUS Prof Loh Kian Ping for his breakthrough research in graphene chemistry. Two teams from NUS and NTU receive the President's Technology Award for their works on eye treatment technology.

The pinnacle award, the President's Science and Technology Medal, went to Prof John Wong, CEO of the National University Health System. Prof Wong is a pioneer in Singapore's push for biomedical science and was instrumental in shaping its development.

Prof Wong said: "I'm glad to have been able to contribute to help develop the medical school, the NUS Yong Loo Lin School of Medicine to a school where we are able to turn out some really world-class young doctors. Our graduates are highly sought after from all around the world and I guess I'm very proud of all our students.

"I'm also proud of being able to help develop the cancer scene in Singapore. We are now able to treat all cancers in Singapore and no one needs to go overseas for treatment."

Mr S. Iswaran, Minister in the Prime Minister's Office, said: "The depth of Singapore's research talent base has been key to our ability to tap science, technology and innovation in growing our economy. We will continue to focus on developing a strong core of Singaporean research talent through comprehensive talent development programmes.

"Equally, the diversity of our talent ecosystem is a critical success factor for the generation of novel approaches and insights, through the creative and vigorous exchange of ideas. Hence, even as we grow the Singaporean core of our research talent base, we must continue to ensure that the community of scientists and researchers remains diverse and vibrant to facilitate the cross-fertilisation of ideas."

Mr Iswaran noted that the overall number of researchers, scientists and engineers has doubled over the last decade. There are about 30,000 of them in both the public and private sectors ... and 70 per cent of them are Singaporeans and Permanent Residents.