By the time she saw Professor McAllister, the prognosis was grim. “She was legally blind when I saw her. Her vision was at the stage where she’d have been eligible for a blind pension,” he said. After the treatment however, the vision in her right eye was restored. The damage to her left eye had been left too long.

Professor McAllister said other treatments were focused on managing the end-stage complications of the vein obstruction rather than tackling the obstruction itself so that vision could be restored. Some patients even endured painful injections into their eyes each month to help manage the condition. “This treatment represents a cure for many patients afflicted by this otherwise blinding eye condition,” he said.

Laser Method to Restore Sight an Aussie Miracle

Thousands of Australians facing certain blindness have been given hope of a complete cure from a single, painless laser treatment developed by Australian scientists.

The claim by internationally renowned ophthalmologist Ian McAllister follows verification of his ground-breaking laser treatment, which is the first cure in the world for the debilitating condition central retinal vein occlusion (“RVO”). RVO is the fifth-most common cause of blindness in Australia.

Perth grandmother Lorraine Hillier was one of the first to benefit. A few years ago, she was legally blind. Now she’s driving a car, has thrown away her glasses and is living life to the full after her sight was restored. “It’s a miracle; it really is,” she said. “I can’t thank him enough.”

Professor McAllister, who was a state finalist in this year’s Australian of the Year awards, said an 18-month human trial of his procedure, funded by the National Health and Medical Research Council, recorded a 76 percent success rate. Professor McAllister and his team from the Lions Eye Institute in Perth spent 15 years developing the treatment, which creates a bypass around blockages in the retinal vein that cause progressive blindness, particularly in the elderly.

Mrs Hillier was headed for total blindness after losing the sight in her left eye, and then discovered the same problem emerging in her right eye. “I panicked a bit,” she said. “If I lost the second eye, I’d be completely blind. It affects everything; you lose all of your independence.”

Brain Estrogen Shows Promise as Schizophrenia Treatment

Experts have discovered a form of estrogen that is effective in the reduction of the symptoms of schizophrenia.

The lead researcher Jayashri Kulkarni, director of the Monash Alfred psychiatry research centre, believes the hormone will be effective in men too. She led the use of standard estrogen to treat schizophrenia after noticing that symptoms were more severe in premenstrual women.

Her study confirmed that brain estrogen had a similar effect to standard estrogen in dramatically reducing schizophrenia symptoms, including psychosis, in post-menopausal women.

While standard estrogen (oestriol) is effective in short bursts, long-term use presents an increased risk of breast cancer and reproductive tumors in women,
and would feminise men. Other “hormonal cues” included a spike in the incidence of schizophrenia in women after giving birth, and in the lead-up to menopause.

Professor Kulkarni found that estrogen had similar effects on the brain’s chemical messengers to some of the newer anti-psychotic medications. Changes in the levels of these chemical messengers are thought to be involved in the symptoms of schizophrenia, such as delusions or hearing voices. Brain estrogen has proved successful in a clinical trial involving 20 Melbourne women, published in the journal Psychoneuroendocrinology.

The study found that patients taking brain estrogen (raloxifene hydrochloride) had a significant improvement in key schizophrenia symptoms including psychosis and showed enhanced memory and learning compared to those on lower doses or a placebo.

Researchers are still working in order to confirm the data and develop treatment options for younger women, and men.

**New Blood Test for Newborns to Detect Allergy Risk**

A simple blood test can now predict whether newborn babies are at high risk of developing allergies as they grow older, thanks to research involving the University of Adelaide.

Professor Tony Ferrante, an immunologist from SA Pathology and the Children’s Research Centre at the University of Adelaide, says the new marker may be the most significant breakthrough in allergy testing in recent decades.

“A protein in the immune cells of newborns appears to hold the answer as to whether a baby will either be protected, or susceptible to the development of allergies later on,” Professor Ferrante says.

Amounts of the cell signaling protein, called protein kinase C zeta, are much lower in children at risk of allergies. Professor Ferrante says the blood test is far more effective than previous indicators, such as a family's clinical history, or measuring the allergy-inducing antibody IgE.

In collaboration with Professor Susan Prescott from the University of Western Australia and Princess Margaret Hospital for Children, Professor Ferrante’s research team has refined the new marker for allergy risk, originally discovered in 2007, but now modified to a simple and manageable blood test at birth.

The researchers are also looking at whether fish oil supplements given to both pregnant women and those who have just given birth can reduce the risks of the children developing allergies. “There is evidence that the levels of this important protein increase with fish oil supplementation to protect against allergy development,” Professor Ferrante says.

Australia has one of the highest allergy rates in the world, with 40% of children now suffering from allergic diseases, including food allergies, eczema, asthma and hay fever. These conditions frequently persist into adulthood, placing a heavy burden on the healthcare system.

The studies and clinical trials have been funded by the Channel 7 Children’s Research Foundation and the National Health and Medical Research Council.

**UQ Wins $6.5 Million for Groundbreaking Research Projects**

A University of Queensland-led global consortium that aims to produce environmentally friendly aviation fuel from algae is one of four UQ research projects awarded a total of $6.48 million in State Government funding.

The grant means UQ’s St Lucia campus will become the base for world-first avgas research, which has Boeing, National and International Research Alliances Program. Funding is going to two of UQ’s algae-sourced biofuel projects, and two medical projects – one on dengue fever, and one on repairing spinal cord damage.

The UQ projects receiving funding are:

- $2 million for Professor Lars Nielsen’s Queensland Sustainable Aviation Fuel Initiative, which aims to create avgas from algae, in work being done at UQ’s Australian Institute for Bioengineering and Nanotechnology.
- $1.48 million for Associate Professor Ben Hankamer’s research into high-efficiency microalgal biofuel systems that aims to produce a range of biofuels through “photo-bioreactors”.
- $1.95 million for Professor Scott O’Neill’s advanced work on curbing the spread of deadly dengue fever by shortening mosquitoes’ life cycle (work that also has won backing from the Bill and Melinda Gates Foundation).
- $1.05 million for Professor Andrew Whittaker’s nanotechnology study that aims to mobilize the
body’s own healing abilities to regenerate and repair damaged spinal cord cells, work being done in conjunction with the Ottawa Hospital Research Institute.

Ms Bligh said the avgas project offered huge environmental benefits and funding meant the consortium would locate its globally significant research in Brisbane.

“Queensland is set to become the home for cleaner, greener, renewable jet fuel,” she said.

Aviation accounted for two percent of global greenhouse emissions and this could grow to three percent without further action. “We’re leading the way on aviation biofuels research,” Ms Bligh said. “With a growing focus on making our skies greener, this is big business and good for jobs and the environment.”

Professor Nielsen said biofuel that was safe to use and could be produced sustainably in quantities that could feed jets’ enormous appetites was the holy grail of the global aviation industry. It also needed to be as cheap, if not cheaper to produce, than fossil fuels.

Professor Nielsen said 18,000 aircraft were in operation globally, and another 25,000 were due to enter service within 20 years. Local partners in the avgas project include Mackay Sugar, Brisbane-based IOR Energy, James Cook University and Queensland’s Department of Primary Industries and Fisheries.

Dr Hankamer said the $1.48 million NIRAP funding to the Institute for Molecular Bioscience would help develop biodiesel, methane and hydrogen from low-cost, high productivity microalgal photo-bioreactors. “A photo-bioreactor is basically a sealed aquaculture system that brings in sunlight to provide the energy that algae need to grow,” he said.

Earlier research by the same team successfully increased green algae’s solar energy conversion efficiency and made production more efficient by refining growth conditions and photo-bioreactor design. It also studied how each strain of algae works best. Dr Hankamer said the new funding would attract a further $2 million in industry and UQ support, enabling the researchers to launch a $3.5 million project to test the economic feasibility of scaled-up new-generation algal energy systems.

The consortium backing the project includes global engineering and construction company Kellogg Brown & Root Pty Ltd, Neste Oil Corp, Cement Australia Pty Ltd, North Queensland and Pacific Biodiesel Pty Ltd, the University of Bielefeld and UQ. Dr Hankamer said algae captured CO2 as it grew, which offered the potential for offsetting CO2 emissions. “Algal bioreactors have the potential to assist Queensland in meeting its renewable energy and CO2 emissions reduction targets,” he said.

The deployment of algae-based systems also eliminated competition with agricultural crops. “One of the big concerns about traditional biofuel crops is that arable land and fresh water are limited and are needed for food crops,” he said. “In contrast, algal bioreactors can be located on non-arable land, essentially eliminating competition with food production. The fact that many strains of energy-producing algae can be grown in saline or waste water is an added benefit.”

The high capital costs and less-than-optimal yields of current bioreactors is a problem. “This project will improve bioreactor design and improve the breeding of high-performance algae to minimize system costs and increase yields,” Dr Hankamer said. “These improvements will assist the rapidly expanding ‘green jobs’ sector and contribute to the production of clean fuels, on a likely five to 10-year timescale.

With its abundance of sunshine and land, Queensland is an ideal location to develop a biofuel and bio-commodity industry based on algae.”

UQ’s dengue fever research would further position Queensland as a leader in tropical health and expertise, Premier Bligh said. “Dengue fever affects more than 50 million people annually and the work of Professor O’Neill and his team is being closely watched throughout the Asia-Pacific region,” she said. “His work involves infecting dengue-carrying mosquitoes with the bacterium wolbachia to both significantly reduce their life span and to make older mosquitoes incapable of biting.”

Professor Andrew Whittaker said the Australian Institute for Bioengineering and Nanotechnology’s spinal cord research was at the cutting edge of bioengineering and regenerative medicine. The project aimed to restore limb function in paraplegics and quadraplegics by developing and manufacturing a biodegradable scaffolding product that could be implanted at the injury site to help rebuild spinal cord.

The scaffold needed to enable the growth of stem cells, encourage their transition into neural cells and biodegrade in a timely manner. About 12,000 Australians are quadriplegics or paraplegics due to spinal cord injuries, and there are 400 new cases a year. The injuries cost the nation an estimated $1.2 billion a year, and a 25-year-old who becomes a paraplegic is estimated to cost $2.9
million for care for throughout their lives, as well as enormous costs – financial and otherwise – for families.

Premier Bligh said the groundbreaking work of Queensland’s leading researchers “deserves to be supported”.

“These are leading lights in Queensland’s biotech research community whose ideas potentially could make a big difference to people’s lives,” she said. “Biotech is an industry of the future and we expect it to be worth $20 billion by 2025. This is about supporting Queensland ideas and innovation into the future.”

CHINA

China: New HIV Model Suggests Killer T Cell for Vaccine

To date the limited success in modeling the behavior of the complex, unusual and unpredictable HIV virus has slowed efforts to develop an effective vaccine to prevent AIDS.

A new improved modeling system, developed by Chinese researchers, which attempts to incorporate more of the virus’ random behavioral dynamics, suggests that a particular type of T cell could be useful in the development of an AIDS vaccine.

Research published in the New Journal of Physics describes how physicists and biologists from Xiamen University have been able to incorporate random patterns in the virus’ mutation, and the way the virus responds to antibodies, into their model.

The new model, and the projections made by the new model for development of disease, mirror real-life, clinical behavior of the virus. Clinical trials show that the HIV virus behaves quite normally during the acute first phase of human infection, normally 2 to 6 weeks after HIV enters the host body, during which time the strength of the virus increases and the immune system deploys T cells against it.

However, the HIV virus avoids being cleared altogether. It is thought that HIV’s ability to evade the immune system relates to its own mutating properties and its ability to preferentially target CD4+ T cells, the master regulators of the immune system. The Chinese researchers have created a simulation which takes a wider range of variables into consideration, and while they are in agreement that both HIV’s mutating and T cell targeting ability are crucial to the virus’ survival, they have found a possible route to tackle it.

To date, no models have been able to discern between the behavioral patterns of two different types of T cells, CD4+ T and CD8+ T cells, both of which are involved in attacking HIV. Patterns emerging from these new models now suggest that CD8+ T cells could be used to stimulate a stronger response against the virus.

This particular type of T cell does not appear to be as preferentially targeted by HIV as its counterpart, and also appears to be more actively involved in putting the virus down during the first acute phase of the infection. “We assess the relative importance of various immune system components in acute phase and have found that the CD8+ T cells play a decisive role in suppressing the viral load,” the researchers say. This observation could mean that stimulation of a CD8+ T cell response might be an important goal in the development of an effective vaccine against AIDS.”

17 Babies Injected with Expired Medicine

A total of 17 measles-plagued babies were injected with expired medicine in a hospital in Harbin, capital of Northeast China’s Heilongjiang province, local health authorities said.

According to a release from the Harbin public health bureau, the babies have all been examined by doctors, who determined that they did not suffer any adverse reactions. Qu Naifang, deputy director of the Harbin Hospital for Infectious Diseases, pledged to be accountable for the incident.

The hospital said they suspended the medication of the expired Inosine and glucose injections produced by Jiangsu Chenpai Pharmaceutical Co immediately after the incident was exposed on Monday. The expiration date of those intravenous drips was October 2009.

Xu Pengfei, a pediatric doctor with China-Japan Friendship Hospital in Beijing, said if the expired medicine had spoiled, it could cause
an unfavorable effect. “It’s hard to tell because different patients have different reactions to drugs,” he said. “But such an incident should not occur in hospitals.”

The hospital attributed the incident to nurses who mixed the expired medicines with fresh ones. Three nurses were laid off, the charge nurse was dismissed from her post and two hospital officials were reprimanded. Families of some babies who were not included in the 17-baby name list believed that their children had also been injected with the expired medicine, which led to a deterioration of their children’s health.

Pu Guangbin, a 37-year-old farmer from Tonghe County in Heilongjiang, said that his 6-month-old son died in the hospital last Thursday, two days after the baby was admitted to the hospital. Pu, who could not show the bottle of the expired medication, insisted that his baby was injected with the expired medicine. “I want an explanation from the hospital,” Pu said, sobbing.

Zhang Yong, 42, a farmer from Harbin, said his 9-month-old daughter was admitted to the hospital last Friday, and then transferred to the intensive care unit two days later. “The doctor told me this Tuesday morning that my daughter was facing life-threatening danger, and that she would die at any time,” he said, near tears.

Substandard Human Rabies Vaccine Recalled

A Chinese biological company has issued a recall of a batch of its human rabies vaccine over concerns for consumer safety, the State Food and Drug Administration (SFDA) announced.

The vaccine, which was made and released by the Wuhan Institute of Biological Products in Central China’s Hubei province under batch number 200905007-3, involved 10,902 doses, of which 8,376 had been used by Monday, the administration said in an online statement.

To date, drug authorities have received no reports of adverse side-effects associated with the substandard vaccine, the statement said. The vaccine was found to contain an excessive amount of bacteria endotoxin, which can cause fever.

Other factors, such as whether and how this would impact its effectiveness, as well as when and where it was released and used, were not mentioned. Health professionals recommend that people who have been bitten by dogs or other animals receive the human rabies vaccine as soon as possible, because the disease is nearly 100 percent fatal for those infected.

Each year, more than 40 million people are attacked by animals on the mainland, mostly dogs, with more than 2,400 deaths from human rabies, official statistics showed. “Without a timely, quality vaccination, one would develop the fatal human rabies after a bite by infected dogs,” said He Xiong, deputy director of the Beijing Center for Disease Control and Prevention.

Of the 75 million dogs on the mainland, less than 20 percent have been vaccinated against rabies. To help ensure the safety and quality of biological products like the human rabies vaccine, the SFDA began to send inspectors to manufacturing companies.

Most of them were fresh out of university and inexperienced in detecting problems, according to an industry insider who wished to remain anonymous. He also indicated that corruption might have been involved. In recent years, stories of substandard vaccines have periodically made headlines in China.

Two Chinese drug firms were previously punished for producing more than 200,000 doses of substandard human rabies vaccine. Some experts have blamed limited production capacity as the cause of inferior vaccines.

“That’s particularly true in the case of human rabies vaccine,” said He. If the output exceeds the real capacity, the vaccine will not work as well, he noted. “The manufacturers should be held accountable for such incidences and the drug authority should work toward improving supervision,” he recommended.

In the latest case, the official website of the Wuhan company made no comment on the recall, despite the SFDA calling it a voluntary one initiated by company.

China Faces New Health Scare Over ‘Bad Vaccines’

Four years ago, Qiang Qiang was a healthy boy. Now, he is epileptic and has trouble keeping up at school — problems that emerged after a vaccination against Japanese encephalitis.

The seven-year-old is one of dozens of youngsters in the northern Chinese province of Shanxi whose
parents believe their children may have suffered serious side effects from vaccines in the country’s latest public health scare.

“His teacher at school tells us he is dumb, that he has short memory and cannot follow classes,” his father Gao Changhong said. “We have spent nearly 60,000 yuan (US$8,800) to try to cure him, and we really hope the government will take this situation seriously.”

A Chinese state media report last month said four children had died and more than 70 others in Shanxi fell ill after they received shots against illnesses including hepatitis B and rabies between 2006 and 2008.

The China Economic Times report blamed vaccines that had been exposed to excessive heat and should have been destroyed. The report quoted Chen Tao’an, a whistleblower at Shanxi’s Centre for Disease Control (CDC) where the vaccines were being handled, as a key source.

China’s health ministry initially investigated reports of bad vaccines in Shanxi in 2008 and found no problems. But a probe of the latest allegations indicated issues with “management” of the vaccines, though the shots themselves were not faulty when first produced, the health ministry said. It however insisted that the vaccines were not responsible for the four deaths.

According to the World Health Organisation, vaccines that are exposed to high temperatures can lose their effectiveness and trigger reactions.

Shanxi’s CDC admitted in a press briefing that its former director had been dismissed following irregularities in his ties with the vaccine firm at the heart of the scandal. But it has insisted its shots were safe. The allegations have triggered yet another health scare in a nation regularly plagued by food and medicine-related product safety concerns.

In the past few weeks alone, authorities have ordered inspections of cooking oil nationwide after reports said up to one-tenth of China’s supplies contained cancer-causing agents. Peddlers in the central province of Hunan have also reportedly been found soaking dry soybeans in green dye and selling them as fresh green beans.

And according to state media, a drug firm in the eastern province of Jiangsu has been accused of using an additive in a rabies vaccine that allowed it to meet inspection standards at a lower cost but compromised its potency.

The State Food and Drug Administration has admitted that “inferior materials” were used in producing the rabies vaccines. It said the firm had been ordered to halt production and some employees were suspected of criminal activity. The parents of the children in the Shanxi case are convinced their children were harmed by faulty vaccines.

Wang Mingliang lost his baby son after he received a vaccine against hepatitis B. Xiao'er soon began suffering from spasms and breathing difficulties — he died months later. “We spent more than seven months trying to get him well, from Western medicine to traditional Chinese medicine, and nothing worked,” he said.

“None of the hospitals we went to managed to find a cause for his illness, and that’s when we started suspecting the vaccine.” China has launched a high-profile product-safety blitz in recent years after a string of scares. Yet high-profile scandals like the melamine-tainted milk supplies in 2008 demonstrate the huge up-hill task faced by authorities. At least six babies died and 300,000 were sickened as a result, according to the government.

INDIA

Artificial Blood Vessels Developed from Jatropha

Artificial blood vessels from Jatropha? After bio-diesel, this humble tropical weed could now help Indian researchers to indigenously develop blood vessels.

A biodegradable polymer recently developed from Jatropha has attracted researchers from IIT-Madras to work towards a project in this direction. The IITians are not alone. A Thiruvananthapuram-based medical institute Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST) and a Belgium-based multi-national company have also shown interest in the polymer developed by a Gujarat-based national research institute.

The Central Salt Marine Chemicals and Research Institute (CSMCR) located in Bhavnagar district of the state has hit upon a process by which biodegradable polymers can be developed at almost zero-cost using one of the byproducts of Jatropha — a drought-resistant perennial plant that grows even in sandy and saline conditions.

“After bio-diesel, this humble tropical weed could now help Indian researchers to indigenously develop blood vessels. Artificial blood vessels from Jatropha?” said Pushpito
K Ghosh, director of the institute.

The institute has so far been offering its expertise to a number of Indian and foreign automotive manufacturers like DaimlerChrysler, General Motors and Mahindra & Mahindra to develop efficient vehicles that run on bio-diesel sourced from Jatropha. It has also been doing pioneering work in developing bio-diesel from Jatropha.

The scientists, however, continued to experiment with one of the by-products, crude glycerol, and discovered this biodegradable polymer which is believed to have multiple uses in the field of medicine including the development of artificial blood vessels.

Such artificial blood vessels generally consist of a woven, braided or knitted fabric structure. They are tubes made from synthetic (chemically produced) materials to restore blood circulation. “The polymer could be used in spinning thin hollow fibers which could act as a substitute for blood vessels,” Mr Ghosh said. The polymer was a “relatively inert material” and is biodegradable when left in soil. “The long term degradation of this material is a matter of careful study,” he added.

A leading cardiac surgeon in Ahmedabad, Dr Apoorva Kanhere says that any material that is being developed as an artificial blood vessel need to be inert and supple. “It should not be thrombogenic (meaning it should not aid the clotting of blood) and it should also be able to withstand the blood pressure,” he said.

Synthetic grafts in humans are often required in various vascular bypass surgeries. Such surgery is done to open blocked arteries in one part of the body by using a vessel from elsewhere in the body. However, up to 40% of patients (especially those who are diabetic) don’t have a vessel suitable for the procedure. In such cases, surgeons use synthetic grafts or artificial blood vessels.

While IITians are looking to develop artificial blood vessels, a Kerala-based institute is also looking at possibilities to develop nano particulate systems which could be used in developing medical instruments for targeted delivery of drugs.

The new discovery has also caught the attention of a Belgium-based firm which is looking to jointly collaborate with CSMCRI to commercially develop the biopolymer on a PPP (Public-Private Partnership) basis. If negotiations work out, then a joint collaboration with this firm can be forged, Mr Ghosh said. “This will help the discovery to be taken to the second phase which will involve scaling up the production of the polymers from a few grams to kilogram,” he added.

Eventually, according Mr Ghosh, the third phase of the project at CSMCRI will involve scaling up the production to the tonne-mark. “We have sent a few grams of the polymer to both the institutes (IIT-Madras and SCTIMST) for preliminary tests,” Mr Ghosh said.

The success of the polymer has also attracted the country’s Department of Science and Technology which has floated a proposal to fund 70% of the project cost, provided the institute has an industry partner who can fund the remaining 30% of the cost.

India and Germany to Initiate Joint Research in Oncology, Regenerative Medicine, Neurosciences
cooperation enables the partners to develop applicable scientific results which could be commercialized and may lead to formation of joint ventures. All publications, patents coming out of these projects, need to be jointly authored by both Indian and German scientists. All necessary approvals like ethical clearance, HMSC approval from Indian point of view as well as EU if, applicable, from German point of view, e.g. before conducting animal experimentation if any needs to be obtained by PI’s before undertaking the project.

The ICMR has invited proposals for the projects from scientists of both the public sector and private sector. Scientists or faculty members working in regular capacity in universities, national R&D laboratories or institutes and private R&D institutes can participate in this program.

For the private sector, partners from all kinds of private sectors can participate in the program, but financing is limited. For Indian scientists from the private sector, only local hospitality in Germany as part of the exchange visit is available from the German side. For German scientists from private sector, only travel costs are available for small and medium size enterprises (for definition of SME ref. to 2003/361/EC) as well as local hospitality in India will be borne by themselves.

**Indian Scientists Decode TB Bacteria Genome**

Indian scientists have mapped the Mycobacterium tuberculosis genome, a first of its kind achievement that gives hope of discovering a cost effective drug for the disease that kills at least 330,000 Indians every year.

“Our scientists along with over 100 science students from several universities have done this within a few months. We hope within 18-24 months we will be able to take one molecule to the clinical trial stage,” Council for Scientific and Industrial Research (CSIR) chief Samir Bramhachari said.

“I am too excited. What we have not done so far has been achieved. I thank all those students who have helped it become a reality. We are doing this through open source drug discovery (OSDD) and anyone across the world is free to join the effort,” Bramhachari elaborated.

Scientists said that though 1.7 million people die of TB every year globally, there has not been any new drug discovery for last the four to five decades. “OSDD is a completely new formula across the world. Here we are making all our progress available to the public. Anyone can take advantage and develop a drug based on our research. The aim here is not patents but drug discovery for a neglected disease,” said Rajesh Gokhle, a senior scientist associated with the project.

**Nearly Half a Million Foreigners Throng India for Cheap Treatment**

Nearly five hundred thousand foreign patients seeking “dirt-cheap” treatment have visited India in the last one year, boosting efforts to make the country a major health tourism destination. Though the trend of foreigners coming to India for treatment has gained momentum only in the last five years, the country is giving tough competition to other medical hotspots like Singapore, Thailand and Malaysia.

“Medical travel in the country is picking up as an attractive option for NRIs and foreign patients and nearly five lakh of them came here in search of dirt-cheap treatment in the last one year,” said Pradeep Thukral, executive director of Indian Medical Travel Association (IMTA).

“A heart surgery which can cost as much as 30,000 pounds in the UK and up to USD60,000 in the US, and a hip replacement that can cost over USD60,000 in America, costs between USD3,000 and USD10,000 and USD15,000 respectively in India,” Thukral said. The recent economic slowdown has also forced corporate, insurance groups as well as out of pocket individuals in the developed world to hunt for better value for their money and India is offering the best deal to them. “As a result, the foreign patients arrival is growing at 40 percent plus rate annually and the sector is expected to touch USD two billion by 2012 as per a McKinsey survey,” he said.

When US citizen Kathleen Dodds (age 42) was diagnosed with a fibroid tumor last year, she found herself in a bind as she was not insured and the cost of surgery was very high - USD30,000. Kathleen found an affordable solution thousands
of miles away in India through ‘IndUSHealth’. Dodds flew out to Apollo Hospital in Delhi, where she had a successful hysterectomy just for USD9,000, including round-trip airfare and hospital stay. ‘I was treated with more care and attention than I had ever experienced in the US that was also without much strain on my pocket,’ she said.

Besides low treatment cost, the availability of world-class hospitals with the latest technology and highly-skilled doctors is contributing to more foreigners visiting the country for treatment. Over 100 top private hospitals such as Apollo Hospitals, Max Healthcare and Fortis are catering to the medical needs of such patients, including complicated operations like hip replacements surgery, spinal work, bypass or valve replacements, plastic surgery and even cancer cure.

Transgenic Chicken for Therapeutic Use Developed

The Project Directorate on Poultry (PDP), Hyderabad, under the Indian Council for Agricultural Research (ICAR) has developed transgenic chicken for therapeutic purposes by transferring a gene from a different species into chicken.

A team, led by senior scientist T.K. Bhattacharya, transferred the enhanced green fluorescent protein (EGFP) gene of jellyfish (Aequorea Victoria), to produce the transgenic chicken. “This transgenic chicken is not edible but is for therapeutic use in fighting viral diseases and cancer, AIDS and Parkinson’s disease,” Dr. Bhattacharya explained. This is the first time this has been done in India. Transgenic chicken was developed in the U.S., U.K., Canada and in China.

The PDP has succeeded in standardizing the technique for developing transgenics in chicken. This technology will further cater to developing transgenic chicken for production of therapeutic proteins for human and animal use. The ICAR has applied for a process patent for its work.

JAPAN

Japan’s Miyazaki Beef Threatened by Foot-and-Mouth Outbreak

Japan’s prized Miyazaki beef is under threat from the country’s first outbreak of foot-and-mouth disease in a decade, which has spread to more than 100 farms, officials said Monday.

The health threat prompted Prime Minister Yukio Hatoyama to pledge 100 billion yen ($1.49 billion) to assist farmers who are expected to lose some 16 billion yen from slaughtering their livestock.

The outbreak, which started last month, has forced the cull of 49 seed bulls, leaving just six to continue breeding a species of cattle that produces the tender premium beef from Miyazaki prefecture on Kyushu island.

The country’s famed “Wagyu” cattle - including beef from Miyazaki, Kobe and other lush grazing regions - first caught the world’s attention following reports the Kobe brand is pampered, fed beer and massaged daily, sometimes with sake, and sometimes even treated to classical music for relaxation.

The beef is sought-after worldwide for its intense marbling with mostly unsaturated fat, and the variety from Miyazaki typically wholesales for around 160 to 320 dollars a kilogram in Japan.

The foot-and-mouth outbreak, Japan’s first since 2000, was detected on April 20 and has spread to 111 farms in Miyazaki in Japan’s south, involving more than 85,000 cattle and pigs, a prefectural farm official said. The disease affects cloven-hoofed animals, including sheep, goats and deer. It is rarely transmitted to humans but spreads easily between animals, causing them pain and often killing their young.

The six most prized bulls from Miyazaki were moved to a safe and isolated location to ensure their survival, said the official, adding that breeding a seed bull was often an arduous task, taking about seven years. “We are praying that we can do something so that the beef brand will survive,” the official elaborated.

Japan has already suspended exports of meat products including Wagyu beef. Japan exports some 35 tonnes of the premium beef from Miyazaki every year. The Japanese government has stepped up efforts to contain the outbreak, putting together Monday an emergency task force to set up roadside disinfection checkpoints for agricultural vehicles and speed up compensation for farmers.

Fears are growing that the outbreak may spread beyond Miyazaki. “It’s becoming a problem not just in Miyazaki prefecture but also on the entire Kyushu island. Above all, we must prevent the disease from spreading further,”
warned Ban Kugimiya, the mayor of nearby Oita city.

The outbreak has also forced the Phoenix Zoo in Miyazaki City to close temporarily in order to prevent contamination of vulnerable species including its giraffes, camels and antelopes. The UN Food and Agriculture Organisation last month urged countries to step up vigilance against foot-and-mouth disease following the cases in Japan and an outbreak in South Korea since early April.

SINGAPORE

Number of Flu Cases Near Epidemic Levels

It is epidemic season in Singapore: The number of cases of flu has gone through the roof.

Although this is a traditionally high season for influenza and colds - collectively called acute respiratory infection - the number of people with the sniffles has been at epidemic, or near-epidemic, levels for the past six weeks. Last week, for instance, 18,420 people sought treatment for the flu at polyclinics alone - or about 4,000 more patients a week than the norm for this time of the year.

Private clinics are also seeing more patients with runny noses, fevers, aching bones and sore throats. The Raffles Medical chain of more than 40 GP clinics has seen the number of such cases jump by about 20 percent. Doctors say many of their flu patients are exhibiting more severe symptoms.

Dr Chng Shih Kiat, deputy medical director at Raffles Medical, said, “They tend to be more serious and prolonged, with complications such as sinusitis, resulting in antibiotics being prescribed.” More worrying is the higher number of patients turning up with pneumonia, a more severe form of upper respiratory tract infection, he added.

Pneumonia is the third-biggest killer here - after cancer and heart disease - accounting for more than 2,000 deaths in 2008. No figures on fatalities last year or numbers for this year are available. Dr Leo Yee Sin, clinical director of the Communicable Disease Centre, said there is a definite increase in flu cases, and that many involve the pandemic H1N1 strain, which created a health scare worldwide last year, but eventually proved to be milder than originally thought.

According to Ministry of Health (MOH) figures, 29 percent of patients here with flu-like symptoms last week had this bug. There has been one H1N1-related death this month. The victim was a 49-year-old Chinese man who died on May 15. The Singapore permanent resident had a history of hypertension, heart problems and diabetes.

His death brings the number of people who succumbed to H1N1 in Singapore to 26.

Another 111 severely ill patients survived after some time in a hospital intensive care unit. People at the greatest risk of H1N1 are pregnant women and those with underlying medical problems such as asthma or diabetes, people who are very fat or have low immunity. An MOH spokesman advised vaccinations, especially for people at higher risk of developing complications. “Vaccination remains the most effective way to prevent influenza infection,” she said.

Those who want to get protection can visit a polyclinic and get the triple-strain seasonal flu vaccine being offered there for under $26. The vaccine protects against H1N1 and the two other major circulating strains here - Influenza A (H3N2) and B.

The Health Promotion Board has been running a series of advertisements exhorting people to practice good hygiene to prevent the flu bug from spreading. Meanwhile, another epidemic is also making the rounds here. Hand, foot and mouth disease (HFMD), a disease that mostly affects very young children, has reached almost epidemic levels over the past two weeks. Last week, there were 667 cases reported.

However, there is relief ahead. Most schools will close for the mid-year holidays from tomorrow, and this will go some way towards breaking the transmission of the disease, since HFMD is often passed between young children in classrooms or childcare centers.

$140m Expansion to Increase R&D Space at The Biopolis

Biomedical research and development hub The Biopolis will undergo a $140 million expansion which will boost its total R&D space to some 310,000 square meters - a move aimed at meeting the increased demand for biomedical R&D space.

According to developer JTC Corporation, the expansion plans will add about 46,000 m2 to The Biopolis and is slated for completion in 2013.

The expanded Biopolis will also incorporate energy-efficient laboratory designs, which will translate to reduced energy consumption as well as higher savings for tenants where operational costs are concerned. Some of the measures that JTC will implement include more accurate sizing of laboratory equipment to reduce energy
wastage, solar control and glazing for laboratory spaces to reduce heat gain, better lighting selection to reduce maintenance and running costs as well as the incorporation of natural ventilated spaces to reduce the building’s cooling load.

“In the upcoming expansion of The Biopolis, sustainability will be taken a step further with... energy-efficient lab design. Some of the sustainable lab design strategies will be more practical and cost-effective in nature,” JTC said. The Biopolis has been purpose-built for public and private biomedical research institutes and organizations.

In 2009, Singapore’s biomedical sciences manufacturing output rose 2.5 percent year-on-year to $20.7 billion, while total employment climbed 7.2 percent to 13,174. Singapore aims for the sector to hit a manufacturing output of $25 billion by 2015.

Meanwhile, total business spending stood at $700 million last year while fixed asset investments (FAI) were $1.2 billion. Located at one-north, The Biopolis is currently in Phase 3 of its development. By end-2010, Phase 3 will add 41,500 m2 of space to the biomedical hub for R&D laboratories and supporting offices.

Phase 1 of The Biopolis (a 185,000 m2 seven-building development) is fully occupied, as is Phase 2, which comprises a cluster of two buildings spanning 37,000 m2.

Singapore Scientists’ Zebrafish Model for Parkinson’s Disease an Important Step Closer to Drug Development for the Disease

Scientists at the Genome Institute of Singapore (GIS), a biomedical research institute of the Agency for Science, Technology and Research (A*STAR), have recently developed a zebrafish model for Parkinson’s disease that can be used for understanding the mechanism underlying its development. The knowledge gained will be helpful for future screening of new drugs to treat Parkinson’s disease (PD).

This study describes the first zebrafish model for LRRK2 mutation-related PD. It is able to overcome some limitations of other animal models of LRRK2 and demonstrates that zebrafish, a tropical freshwater fish that can often be found in aquariums, can be used to study the development of human diseases. Led by GIS Group Leader Dr Liu Jianjun, the finding was published in PLoS Genetics.

To explore the biological functions of LRRK2, the scientists studied this gene in zebrafish by blocking its normal function. This resulted in Parkinsonism-like phenotypes in zebrafish, including locomotive defects and loss of neurons, similar to those of PD patients. It was found from the study that the defects of the fish can be rescued by expressing the normal protein of LRRK2. Significantly, the administration of Levo-dopa (L-dopa), a compound that is widely used to treat PD, can also rescue the locomotive defects caused by the modification of the zebrafish LRRK2 protein.

Parkinson’s disease (PD) is a degenerative disease of the brain that often impairs motor skills, speech and other functions. The discovery of several gene mutations in affected patients clearly demonstrated the involvement of genetic factors in the development of PD. LRRK2 was discovered from previous studies by the same team of researchers to be one of the most important genetic causes of PD in the Asian population.

“Parkinson’s disease is a degenerative disease of the brain that often impairs motor skills, speech and other functions. The discovery of several gene mutations in affected patients clearly demonstrated the involvement of genetic factors in the development of PD. LRRK2 was discovered from previous studies by the same team of researchers to be one of the most important genetic causes of PD in the Asian population. This work shows how the use of a simple model system in fish can help decipher the root causes of a serious human disorder like Parkinson’s disease,” said Professor Edison Liu, Executive Director of the GIS.

Dr Lim Kah Leong, Associate Professor of the National Neuroscience Institute and Duke-NUS Graduate Medical School, added “This novel and elegant study has illuminated the role of an otherwise poorly understood but important domain of LRRK2 that is associated with an increased risk for Parkinson’s disease amongst Asian populations. The use of zebrafish as a disease model is a clever approach. I am definitely pleased to note that our arsenal of experimental organisms for drug screening has expanded with this study.”

The zebrafish model derived from this study serves as a vertebrate model suitable for large-scale drug screening and provides a good disease model for PD. Using a novel technology known as the Zinc-finger nucleases (ZFNs), further research is being carried out to generate additional mutations of zebrafish LRRK2 gene. Such mutated zebrafishes can be used for advancing investigation for the biological mechanism of PD and screening of new drugs for PD treatment.

Painless, Cheaper Way to Diagnose Bladder Cancer

Doctors here may have found a way of detecting bladder cancer through a simple urine sample, instead of the current method of having an invasive scope exam. If the team is successful, the test will not only be cheaper and far less painful, but it could also be
more effective, as early studies have shown it to be 100 percent sensitive. By comparison, a cystoscopy has only 33 percent sensitivity, the study found.

The researchers from the National University Health System and the National University of Singapore (NUS) received a $400,000 grant to start clinical trials for their method, which is called non-invasive urinary metabonomic diagnosis of bladder cancer.

The researchers put urine samples from 24 bladder cancer patients and 51 patients without the condition through a series of gases, heat and cold and monitored the concentrations of a set of metabolites - the by-products of the body in reaction to toxins in foods and the environment.

Dr Eric Chan, assistant professor with the department of pharmacy at the science faculty of NUS and one of the researchers, said the tests could “clearly distinguish the presence of the cancer based on the metabolic profiles.”

Cystoscopy, in which a flexible fibre-optic tube is inserted into the urethra to examine the bladder, is very uncomfortable, said Professor E. Kesavan, head of the department of urology at the National University Hospital (NUH). “It is also relatively expensive as the procedure has to be repeated every three to 12 months, depending on the patient’s risk of recurrence,” added the senior consultant, who has 20 years of experience in treating the cancer.

The bladder is a reservoir for urine from the kidneys. Cancer can result if the cells lining the bladder develop abnormally. Bladder cancer is the 10th most common cancer in men here, and is about five times more common in men than in women.

The most common symptom is the passing out of bloodstained urine but it is usually not painful. If bladder cancer is suspected, the doctor will arrange for a cystoscopy and a biopsy or removal of a small amount of tissue from the lining of the bladder.

Prof Kesavan said treatment depends on the stage of the cancer, the type of bladder cancer, and the patient’s age and general health. “Surgery is recommended for most early bladder cancers and the five-year survival rate is good at 95 percent,” he added.

Dr Chan said the study was inspired by a documentary on dogs in Britain and the United States trained to detect cancer from urine samples of patients with breast and lung cancer. “The cancer cells release biochemical substances not produced by normal cells and these dogs detect them by sniffing. They were able to identify the cancer in the samples with near-perfect accuracy,” he said. This inspired the team to look at the chemical extracts within the urine samples that attracted the dogs in the documentary.

A study carried out between December 2008 and August last year on 24 patients who had the cancer and 51 who did not found the method to be 100 percent accurate. Dr Chan added that the results also showed the potential of assessing which stage the cancer is at.

The findings were published online by the Journal of Proteome Research, an American peer-reviewed scientific journal, in March.

The Singapore team’s $400,000 grant - by the National Medical Research Council - is part of the more than $60 million the council disburses in grants a year for hospitals and tertiary institutions to carry out research. The researchers are recruiting 100 patients with bladder cancer and 100 patients without to kick-start the trial.

Dr Chan said, “We managed to get 18 bladder cancer patients to sign up. It is a slow process but we are confident we will be able to get more.” Ultimately, the team hopes to develop laboratory equipment as good as the sniffer dogs.

Fujitsu Establishes its First Biomedical Research Laboratory in Singapore

In partnership with A*STAR, Fujitsu will provide cutting-edge methodology to drive research for diagnosis of cancer and diseases.

Fujitsu Laboratories Ltd., Fujitsu Asia Pte Ltd. and the Agency for Science, Technology and Research (A*STAR) jointly announced the official opening of a new research facility in Singapore, Fujitsu Laboratories & R&D Division of Fujitsu Asia Pte Ltd. (hereafter, “Fujitsu Laboratories Singapore”). As Fujitsu’s first biomedical focused research facility in the South East Asia region, the laboratory is part of a comprehensive ecosystem which partners universities and research institutes with industry-relevant capabilities that will further strengthen Singapore’s status as Asia’s research and development (R&D) hub. Fujitsu will be working with A*STAR on the development of aptamer technology for diagnostics application and business development trials.

Fujitsu Laboratories Singapore will support a number of key research initiatives, working in collaboration with A*STAR, Experimental Therapeutics Centre (ETC), National University of Singapore (NUS), National University Hospital (NUH) and the Cancer Science Institute (CSI) to explore...
improvements in diagnostics of diseases such as prostate and gastric cancer, cardiovascular diseases and dengue through the development of aptamers.

Currently, antibodies are used in diagnostics of diseases. The use of aptamers versus antibodies ensures higher consistency, stability and overall quality, resulting in a more efficient and cost effective diagnostic process. Using aptamers for diagnostics will see individuals benefiting from more effective and cheaper diagnosis of diseases, resulting in earlier detection and treatment. This will ultimately translate into higher cure rates and a better quality of life. Governments globally will also benefit as this will mean lower healthcare costs. In addition, Fujitsu’s proprietary methodology for aptamer development enables optimization in the development process benefiting the pharmaceutical, healthcare and biomedical industry.

“One of the missions of Fujitsu Laboratories Singapore is to conduct strategic research that addresses important biomedical problems, through our novel technology methodology that presents major commercial potential. This is closely aligned with Fujitsu Laboratories’ greater vision of creating a ‘human-centric networked society.’ The launch of Fujitsu Laboratories Singapore and our collaboration with A*STAR symbolises our commitment to contribute to the Asia region by improving human life through innovative technologies,” said Kazuo Murano, Chairman, Fujitsu Laboratories Limited.

“Our partnership with A*STAR is further testament of our goal of advancing open innovation, which encourages information exchange across institutions and geographies free of barriers. By encouraging open information exchange between universities, government and research institutes globally, we hope to increase collaborations resulting in R&D that will drive new innovations in Information Communication Technology,” Dr. Murano added.

“The opening of the Fujitsu Laboratories Singapore reafirms Fujitsu Asia’s broader goal of bringing the best technologies from around the world to Singapore. Fujitsu is the first Information Communications Technology company to provide innovative methodology for aptamer development. Fujitsu’s collaboration with A*STAR represents our commitment to being part of an ecosystem that will enable Singapore to harness innovations in technology, with the aim of developing a world-class R&D hub for diagnostic aptamer research,” said Francis Goh, President, Fujitsu Asia Pte Ltd.

Through R&D in electronics, Fujitsu Laboratories started research in nanotechnology in 2000, with one of the focus areas being nano-biotechnology. The world-unique methodology in modified DNA aptamer applied in Fujitsu Laboratories Singapore is a result of 10 years of R&D in nano-biotechnology. The opening of this new lab facility and collaboration with A*STAR reaffirms the company’s commitment to enhancing human life through the application of technology.

“Fujitsu and Singapore have enjoyed more than three decades of strategic partnership. With the inauguration of Fujitsu Laboratories Singapore at Biopolis, Fujitsu has taken the bold step of expanding its full value chain of activities in Singapore into upstream R&D. Fujitsu’s decision underscores Singapore’s attractiveness as an R&D and innovation hub, and our standing as the Biopolis of Asia. Fujitsu Laboratories Singapore’s collaborations with ETC, NUS, NUH and CSI also demonstrate the success of our strategy in offering a comprehensive, integrated biomedical sciences ecosystem that companies find appealing. Singapore and A*STAR look forward to many more years of successful strategic partnerships with Fujitsu,” said Mr Lim Chuan Poh, A*STAR Chairman and the Guest of Honour at the opening of Fujitsu Laboratories Singapore.

Aptamers came to be known recently as an alternative to antibodies. They are manufactured chemically, not biologically, thus ensuring higher consistency and overall quality. However, because aptamers used up to now are made from RNA having unstable nature, they are used in only limited areas. Fujitsu established a novel aptamer development system using stable DNA instead of RNA. One unique characteristic of this aptamer system is its high potential to enable a variety of chemical interactions. This makes Fujitsu’s aptamer technology a powerful tool to develop alternatives to using antibodies. By employing Fujitsu’s aptamer technology, establishment and optimization processes of diagnostics development become more efficient. Fujitsu Laboratories Singapore will work closely with customers, partners and academia to generate advancements that will drive research in the area of diagnostics.

Fujitsu aims to be the Asia centre for R&D research across various disciplines, bringing together research expertise and know-how from Fujitsu Laboratories sites located in other countries.

By fostering a collaborative community, Fujitsu will be exploring ways to encourage the sharing of
knowledge and best practices. Fujitsu Laboratories’ aim is to create commercial value for R&D of our customers, partners and academia, as leverage to develop better tools and products with the goal of enhancing human life.

A*STAR and Fujitsu have enjoyed close collaborations on R&D in the physics sciences with the most recent announcement on a partnership to develop petascale computing. The expansion of the strategic partnership into biomedical sciences will allow Fujitsu to continually value-add to the nation through its strength in developing innovative technology solutions. Fujitsu Laboratories Singapore is located in Biopolis, a hub dedicated to biomedical R&D activities and has an environment that fosters a collaborative culture among the private and public research community.

Fujitsu Laboratories Singapore joins a growing community of companies such as GlaxoSmithKline, Novartis, Roche, Abbott and Hill-Rom that are engaged in biomedical R&D in Singapore. To date, 4,300 researchers carry out biomedical sciences R&D in Singapore that includes drug discovery, translational and clinical research in more than 50 companies and other public-sector institutes. In 2009, the output for biomedical manufacturing grew steadily to about S$21 billion and the sector employed more than 13,000 people.

**A*Star, MRC Grant $4.5m for Six Research Projects**

Singapore’s Agency for Science, Technology and Research (A*Star) and the UK’s Medical Research Council (MRC) announced yesterday that they have jointly awarded $4.5 million in grants to six collaborative research projects in infectious diseases.

Each project aims to contribute towards developing a treatment, vaccine or antimicrobial product to address disease infections. Under one grant, researchers from A*Star’s Institute of Medical Biology and the UK’s Imperial College London aim to shed light on the signaling pathways of rogue strains of Escherichia coli (E. coli), a bacteria found in the gut.

One strain is the leading cause of infantile diarrhoea, morbidity and mortality in developing countries. The other is predominant in the developed countries and can cause gastroenteritis or hemolytic-uremic syndrome. Another grant, shared by researchers from A*Star’s Singapore Institute of Clinical Sciences and the UK’s University College London, will be targeted at redirecting the body’s T cells to overcome tolerance in chronic hepatitis B infection.

The other four collaborations are between:

- **# National University of Singapore (NUS) and University of Liverpool** to optimize the interacts of drugs used to treat tuberculosis and HIV.
- **# A*Star’s Singapore Immunology Network and Imperial College London** to examine the interplay between regulatory T cells and Streptococcus bacterium.
- **# Nanyang Technological University and the UK’s National Institute for Medical Research** to investigate how the malaria-causing Plasmodium parasite evades the immune system.
- **# NUS and the University of Birmingham** to study how multi-antibiotic resistant bacteria responsible for hospital-acquired infections actively pump out drugs from their interiors.

Lee Eng Hin, executive director of A*Star’s Biomedical Research Council, said, “By bringing the two communities together, we aim to accelerate knowledge creation with the goal of treating, eradicating and preventing infectious disease, and improving human health.”

**Singapore Scientists Exploit p53 to Improve Cancer Treatment**

Researchers from the p53 Laboratory of Singapore’s Agency for Science, Technology and Research (A*STAR), have made a discovery that makes feasible a unique method of cancer treatment. Their work, published online in the leading journal Cell Death and Differentiation, offers new insight on how to tap on the properties of p53, the ‘guardian of the genome’, to more effectively kill cancer cells while sparing normal cells.

The researchers, led by Dr Cheok Chit Fang and Prof David Lane, the co-discoverer of the p53 gene in 1979, achieved this by exploiting one of the key functions of p53 – the control of the cell cycle. Activating p53 halts the cell cycle and prevents endoreplication, a process by which a cell accumulates excess genetic material by duplicating its existing genetic material without actually dividing. If endoreplication happens in human cells, they die. Deliberately inducing endoreplication in cancer cells through chemical means has been explored as a means of killing off cancer cells. However, as the drugs used are not highly specific to cancer cells, many normal cells are also killed in the process.

Fortunately, in many cancers, the cancer cells lack working copies of p53. By using a drug
that activates p53 in healthy cells and temporarily induces the cells to stop the production of genetic material, endoreduplication is prevented. Cancer cells which lack working copies of p53 are thus left susceptible to a second drug that induces endoreduplication, resulting in tumor-specific killing. The activation of p53 is reversible and the normal cells resume their function once the cancer cells have been killed.

Said Prof David Lane, Director of the p53 Laboratory and A*STAR's Chief Scientist, “We are proposing a unique combination of drugs which may have therapeutic benefits and could potentially alleviate the side effects of currently available cancer treatments. The clinical approval of nutlin or nutlin-like drugs will allow such exciting concepts to be tested in the clinic. We hope that this work encourages further breakthroughs in p53 research and brings more efficient and cost-effective treatments for the millions of cancer patients worldwide.”

Dr Cheok said, “One of the most difficult problems in treating cancer is ensuring that normal, healthy cells are not killed over the course of treatment. Many of the currently available methods of treatment, such as chemotherapy and radiation therapy, damage normal cells in the process of killing cancer cells. We are using our knowledge of p53 to overcome this difficulty.”

Dr Cheok was among the first few Singaporeans to embark on a PhD scholarship from A*STAR in 2001. After receiving her PhD from the University of Oxford, she began her post-doctoral training under the tutelage of Prof Lane in 2006. She is also an Assistant Professor and a Senior Research Fellow at the Department of Biochemistry at the Yong Loo Lin School of Medicine, NUS.

Prof Lane added, “We are proud of Chit Fang for having made this significant finding so early in her scientific career. It gives me great pleasure to have her as part of my team working on deepening our understanding of how to use basic science findings to develop new therapies.”

TAIWAN

Taiwan Scientists Identify Keys to Bipolar Disorder

A group of Taiwan scientists have successfully identified four genes that are associated with bipolar I disorder in people who are ethnically Chinese.

“This study marks important progress in the identification of disease genes for bipolar I disorder. It is the only large scale bipolar I disorder study ever done on Han Chinese or on any Asian population,” said the team’s leader, Andrew Tai-Ann Cheng, a distinguished research fellow in Academia Sinica’s Institute of Biomedical Sciences.

Bipolar I disorder is a mood disorder defined by the presence of recurrent episodes of abnormally elevated mood (mania), according to the research team. Some patients who experience manic episodes also experience depressive episodes, or mixed episodes, in which features of both mania and depression are present at the same time.

The affliction, which affects approximately 1 percent of the world’s population, often interferes with patients’ personal lives and affects their ability to function socially. The scientists said the inheritability of bipolar I disorder has been estimated to be around 80 percent and is passed down through multiple genes, but the exact cause of the disease remains unclear.

In this study researchers analyzed the genes of 1409 patients with bipolar I disorder and 1000 normal individuals using high density genotyping technology. They linked four genes — SP8, ST8SIA2, CACNB2 and KCTD12 — to bipolar I disorder in ethnic Chinese people, and three of them (SP8, CACNB2 and KCTD12) were identified for the first time.

Because SP8 and ST8SIA2 influence the development of the brain, the scientists said their study supports a model attributing the development of bipolar I disorder to the growth of the brain or central nervous system. CACNB2 and KCTD12 are genes regulating calcium and potassium ion channels, which also suggested that disorders of the ion channels — proteins that regulate the flow of ions across cell membranes — contribute to the development of bipolar I disorder.

“The genes identified in this study pave the way for researchers to elucidate pathogenic mechanisms for bipolar disorder and perhaps new drug targets for the disease,” Cheng said. With the combined effort of public health and medical centers, Cheng hopes that in the future genetic factors associated with the pharmacological effects of mood stabilizers can also be identified, leading to advances in health care, personalized medication, and the prevention of bipolar disorder and suicide.

The study was the result of a collaboration between the Institute of Biomedical Sciences and 25 medical centers and psychiatric institutes in Taiwan. A Taiwan Bipolar Consortium was established by Cheng in 2003 to cement the collaboration
of the many organizations. The study was published online in the international scientific journal Molecular Psychiatry.

NORTH AMERICA

First Prostrate Cancer Vaccine a Major Breakthrough

Renowned oncologist Anuradha Hooda said that the first vaccine to treat prostrate cancer Provenge, is a major scientific breakthrough in fighting the disease.

The Government of United States approved this vaccine, which was developed by the US-based Dendreon Corporation. “This is a major breakthrough in cancer treatment. This concept has been looked at for many years but we haven’t been able to be successful in coming out with any cancer vaccine treatment. There have been a lot of trials done in Melanoma also but before they are able to come out in clinical use the drugs have fizzled out. This is the first of its kind and hopefully many more will follow. This is a completely new concept,” said Anuradha Hooda, Chief Medical Oncologist and Hematology at the Max Super Speciality Hospital.

Unlike traditional vaccines that prevent a disease, Provenge treats prostate cancer by stimulating the body’s own immune system to attack malignant cells. It is produced by taking cells from a patient’s tumor and incorporating them into a vaccine that is injected back into the patient.

Dendreon is the first company to show a cancer vaccine can extend patient survival. In a late-stage study of 512 patients, men given Provenge lived an average of 4.1 months longer than the other patients.

According to the Indian Council of Medical Research that tracks cancers in India, there are 5 million cancer cases at any given time, with 800,000 new cancers and 550,000 cancer deaths occurring each year. Hooda believes that the disease can be tackled if the patients are aware enough about their symptoms and cure.

“The major thing that needs to be done is patient education and awareness because that is where the fight really starts. The patients need to be aware of not only the symptoms that may come about from having a disease like that but also be pro-active in going for screening programs for certain kinds of cancers for which we do have well established screening programs,” Hooda said.