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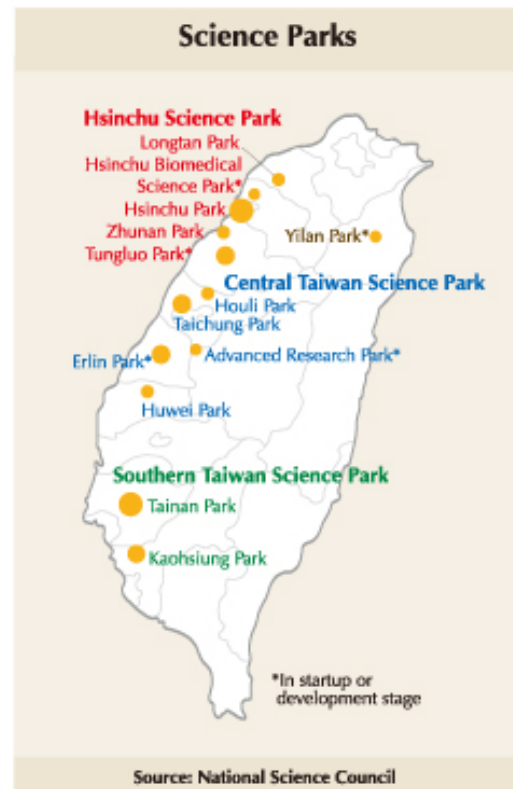
Taiwan's Science Parks

According to the World Economic Forum's *Global Competitiveness Report 2011-2012*, Taiwan ranks first in its "state of cluster development" index. More than a dozen science parks in Taiwan are organized into three geographic groups: Hsinchu Science Park, Central Taiwan Science Park and Southern Taiwan Science Park.' Newcomers to the science park system, currently in the startup stage, include the Yilan Science Park, the Hsinchu Biomedical Science Park, and the Advanced Research Park in Nantou County. Expansion of a number of other parks is also underway.

Taiwan's science parks are designed and administered to provide ideal conditions for high-tech business operations. These include affordable leases, secure supplies of water, power and materials, and efficient shipping services. The parks also provide excellent environments for developing powerful synergies with clusters of related enterprises, some in nearby industrial parks, as well as with public R&D institutions.

Related Websites:

- National Science Council: <http://www.nsc.gov.tw>
- Department of Industrial Technology, Ministry of Economic Affairs: <http://www.moea.gov.tw/Mns/doiit>
- Atomic Energy Council: <http://www.aec.gov.tw>
- National Applied Research Laboratories: <http://www.narl.org.tw>
- Industrial Technology Research Institute: <http://www.itri.org.tw>
- Institute for Information Industry: <http://www.iii.org.tw>
- Hsinchu Science Park: <http://www.sipa.gov.tw>
- Southern Taiwan Science Park: <http://www.stsipa.gov.tw>
- Central Taiwan Science Park: <http://www.ctsp.gov.tw>



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1. Taiwan unveils new competitive strain of soybean

(Central News Agency, 04 03 2013)

The Kaohsiung District Agricultural Research and Extension Station in southern Taiwan recently unveiled a new strain of soybean that it hopes can be sold to local and foreign markets by the end of 2013, a researcher said. "Kaohsiung 12," nicknamed "Emerald," which is the new strain to have been developed this year, but which has not been genetically modified, has higher yield and bigger beans, said Chou Kuo-lung, an associate researcher at the station. The new strain can yield at least 25 percent more than the current mainstream "Kaohsiung 9," he told CNA, adding that its greater production could further enhance its competitiveness on the international stage. Vegetable soybeans, or green soybeans (immature ones in their green pods), are popular exports to Japan. Taiwan produced some 70,000 tons of green soybeans in 2012, with nearly half exported to the neighboring country, Chou said. The export output of green soybeans touched a record of US\$71.6 million last year, up 80 percent from about US\$40 million five years ago, according to government statistics.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201303040005

2. Size of proton may be smaller than thought: research

(Taipei Times 07 03 2013)

An international research team including scientists from National Tsinghua University said that protons may be smaller than previously assumed. Liu Yi-wei, a founding member of the team and an associate professor at the university's physics department, said that mainly hydrogen spectroscopy and electron scattering are used to measure the size of a proton. However, using a new technique in which a muon (a heavy, unstable, relative of the proton) is placed in orbit around a proton, producing an atom called muonic hydrogen, the team found the radius of a proton to measure 0.84087 femtometers, Liu said. The new measurement is approximately 4 percent smaller than the widely accepted radius of 0.8768 femtometers that is recognized by the Committee on Data for Science and Technology. A femtometer is a billionth of a billionth of a meter, or a billionth of nanometer, said Gwo Shangjr, a professor at the university's physics department and head of the research and development office. The precision of the new measurement was increased by 1.7 times, Gwo said, adding that the small, but significant difference in the measurements presents a perplexing puzzle to scientists around the world. The results of the experiment show that there are still missing pieces in scientists' understanding of quantum electrodynamics, Liu said. A new international research team consisting of scientists from nine countries has been formed to continue solving the "proton size puzzle" with experiments on muonic helium, he added.

<http://www.taipeitimes.com/News/taiwan/archives/2013/03/07/2003556490>

3. Transnational NCKU team reveals molecular mystery aging process

(The China Post 13 03 2013)

The mystery of the missing link between aging and genes was discovered by Taiwan's National Cheng Kung University (NCKU) together with Canada's University of Alberta (UAlberta) and U.S.' Institute for Systems Biology (ISB), with the findings published in the Feb. 28 issue of CELL, said NCKU. Dr. Jung-Hsien Chiang from the Department of Computer Science and Information Engineering, who leads the NCKU team, has revealed that the mechanisms of aging are associated with the nuclear pore complexes (NPCs) as an active participant in gene silencing and the formation of peripheral heterochromatin. The paper titled "A Role for the Nucleoporin Nup170p in Chromatin Structure and Gene Silencing" describes the revolutionary findings in which the seven-member transnational research team draws a clear picture that the role of yeast NPC protein Nup170p in subtelomeric gene silencing is linked to its association with the chromatin-remodeling complex. Chiang explained that the aging of cells is closely related to telomere length and each time a cell divides, the telomere gets shorter and eventually leads to cell death; however, to date, it is unclear what functional role NPCs play in establishing and maintaining distinct chromatin domains within living cells. "Our team has uncovered that the binding of Nup170p to subtelomeric chromatin is cooperative and necessary for the association of telomeres with the nuclear envelope, which is a comprehensive roadmap to explain how Nup170p plays a physiological role at telomeres," Chiang added. The team also successfully illustrated that the Nup170p with regions of the genome contain ribosomal protein and subtelomeric genes, where it functions as a repressor of transcription. Chiang said, "This is the first time that we reveal functional interactions between Nup170p and chromatin domains that generally reside adjacent to the nuclear envelope, including subtelomeric and telomeric regions." The members of the team are eminent scholars in their own fields in which the University of Alberta took charge of cell biology; ISB tackled gene expression profiling; and NCKU focused on bioinformatics computing. Chiang's team at NCKU tackles data retrieval from the research and systematic computations provided by NCKU, which facilitated in deciphering the mystery of aging. The result of the study is the preliminary effort toward a general understanding of the aging mechanism, according to Chiang, who noted that the research project is still ongoing and more investment will be made in the coming future.



<http://www.chinapost.com.tw/taiwan/national/national-news/2013/03/13/372857/Transnational-NCKU.htm>

4. Taiwan team finds new way to cut pneumothorax recurrence

(Central News Agency, 14 03 2013)

A research team at National Taiwan University Hospital (NTUH) reported that it has found a way to effectively cut the recurrence rate or surgery for primary spontaneous pneumothorax. Pneumothorax, more commonly known as collapsed lung, refers to an abnormal collection of air or gas in the pleural space that separates the lung from the chest wall and which may interfere with normal breathing by preventing the lung from fully expanding. A primary pneumothorax is one that occurs without apparent cause and in the absence of significant lung disease. Yang Pan-chyr, dean of NTU College of Medicine, said the research team worked with Far Eastern Memorial Hospital on large-scale clinical trials, the results of which were published in the prestigious medical journal *The Lancet*. Chen Jin-shing, a surgeon at the university hospital and one of the research team members, said that more than 2,000 people in Taiwan each year require catheter drainage or surgery due to serious spontaneous pneumothorax. The disease usually strikes tall, slender men aged 15-40, causing sudden chest pains, breathlessness and coughing. A serious case can result in death. Chen said that simple aspiration and drainage is the standard initial treatment, but treatment failure or recurrence is as high as 50 percent. He said that in an effort to cut the recurrence rate, the team randomly assigned 214 patients between Dec. 31, 2006 and June 30, 2012. After simple aspiration and drainage via catheter, patients were randomly assigned to receive minocycline pleurodesis or to be in the control group with no further treatment. At one year, pneumothoraces had recurred in 31 of the 106 patients in the minocycline group, compared with 53 out of 108 in the control group. The recurrence rate for patients in the minocycline group was 40 percent less compared with the control group, while the surgery rate was down by 34 percent compared with the controls, Chen said. The team concluded that simple aspiration and drainage, followed by minocycline pleurodesis, is a safe and more effective treatment for primary spontaneous pneumothorax. The findings were also published on MDLink, a secure medical web portal.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aLIV&ID=201303140028

5. Taiwan develops method to turn grass into charcoal, vinegar

(Central News Agency, 15 03 2013)

Taiwan has developed techniques to turn waste grass into charcoal or vinegar that can be used as raw materials for organic production and as natural cleaning products, reducing carbon dioxide emissions, researchers said. Taiwan produces about 5,000 metric tons of grass per year that goes unused, so to make good use of the resource, the Livestock Research Institute under the Council of Agriculture said, it has developed the method for turning it into charcoal. The water and vapor collected during the charcoal production process is used to produce the valuable grass vinegar, the institute said. The charcoal kilns designed by the researchers cost only around NT\$50,000 (US\$1,682) each and can process up to 200 kg of dry grass at a time. The production cost of each kg of grass charcoal is about NT\$20, far lower than the production cost of bamboo charcoal at NT\$130. The institute said that grass charcoal has better absorption properties than other types of charcoal and contains high levels of phosphorus and potassium, which are essential for plant growth. It can also be used in the manufacture of a variety of deodorizing items. Grass vinegar, meanwhile, can be used to produce highly efficient cleaning products such as soap, detergent and pet shampoo.

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<http://www.taipeitimes.com/News/taiwan/archives/2013/03/17/2003557293>

6. Taiwanese researchers find bacteria to treat fatty liver disease

(Central News Agency, 16 03 2013)

A research team at central Taiwan's Hungkuang University, has succeeded in finding four strains of lactic acid bacteria that may be effective in treating fatty liver, a condition that affects people who are obese or drink a lot of alcohol, the team leader said. Researchers sorted out the functional lactic acid bacteria from millions of their kind, and then fed alcohol-addicted mice with the bacteria under laboratory control, said Tsen Hau-yang, dean of the university's College of Human Ecology. After eight weeks of the feeding practice, the mice's alcoholic-incurred fatty liver condition was found to have shown obvious improvement, Tsen said, noting that the research result has been patented. Now the school in Taichung is talking with local biotechnology companies on technology transfers that will enable the production and marketing of health care foods containing the patented lactic acid bacteria, Tsen said. He expected such dietary supplement targeting fatty liver in humans will be launched in the market within one year. Under Taiwan's draft regulations, dietary or health supplements must pass animal trials to acquire an official permit for sale in the market. The draft is expected to be approved by the Department of Health, the top health authority of the country, this year, according to Tsen's secretary Lin Chun-hao. Taiwan's laws do not require companies making dietary or health supplements to conduct clinical trials on humans. For his part, Tsen said he is



confident in the ability of lactic acid bacteria-containing products, such as yogurt, in strengthening the immunity of the gastrointestinal system in humans. Apart from the lactic acid bacteria used to improve fatty liver conditions, his research team has also developed lactic acid bacteria-containing feeds that can protect chickens from contracting salmonella, Tsen said. In recent years, Hungkuang University has been working to establish an academic/industrial alliance that focuses on the development and production of lactic acid bacteria-containing foods that promote and help maintain human health, the school said.

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<http://www.taipeitimes.com/News/taiwan/archives/2013/03/18/2003557376>

7. Taiwan recognized in world's largest astronomical project

(Central News Agency, 17 03 2013)

Two of Taiwan's research institutions have been recognized for their roles in the world's largest astronomical project based in Chile, which was recently launched to discover more details about the birth of stars and the formation of the universe. The Atacama Large Millimeter/submillimeter Array (ALMA) -- an international partnership of Europe, North America and East Asia with Chile -- was formally launched March 13. It is a single telescope composed of 66 high precision antennas that are located on the Chajnantor plateau, 5,000 meters above the sea level in the north of the South American country. Academia Sinica, Taiwan's top research institution and a partner in the project, asked Chung Shan Institute of Science and Technology under the Ministry of National Defense to establish a Front End Integration Center (FEIC) and to carry out tests on front



end receiver systems at the heart of the ALMA array, according to a defense official. The FEIC in Taiwan was tasked with the testing of 17 units but, after three of them were finished, was asked to test five more in North America since Taiwan was able to demonstrate both quality and punctuality. In 2011, the testing of four receiver systems originally assigned to Europe were handed over to Taiwan, increasing the total number to 26 to be tested by Taiwan's FEIC. As of December 2012, the testing of all 26 units was completed and the systems were shipped to Chile for assembly. In the end, Taiwan' FEIC, which was set up at a later date than all the other integration centers, conducted testing on the largest number of receiver systems with top speed and top quality, according the defense official, who preferred anonymity. The performance of the Taiwan team was recognized by ALMA, he added. The ALMA Front End system, designed to receive signals of ten different frequency bands, is the first element in a complex chain of signal receiving, conversion, processing and recording. Each front end contains a set of extremely sensitive receivers, cooled to temperatures of just four degrees above absolute zero (-269 degrees Celsius), which detect the millimeter- and submillimeter-wavelength light that ALMA "sees." By detecting light invisible to the human eye, the ALMA can show unprecedented details about the birth of stars, infant galaxies in the early universe and planets coalescing around distant suns. The facility is also able to discover and measure the distribution of molecules, many of which are essential for life, that form in the space between the stars.

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http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aECO&ID=201303180032

8. Taiwan inks pact with Japanese cancer center

(Central News Agency, 23 03 2013)

The Taiwan Society for Therapeutic Radiology and Oncology signed an agreement on academic exchanges with a Japanese leading-edge cancer therapy center. Under the agreement, the society will introduce information on heavy-charged particle beam treatment of Saga Heavy Ion Medical Accelerator in Tosu (Saga HIMAT) in Japan to local patients and help them get the treatment in Japan. Jen Yee-min, president of the society and a doctor at the Tri-Service General Hospital, noted that cancer has long the number one cause of death in Taiwan, with treatments including tumor removal, chemotherapy and radiation therapy. Among the types of radiation therapy, there is photon beam (including gamma beam and X beam), and particle beam (including proton beam and heavy-charged particle beam) treatment. Jen said that proton beam and heavy-charged particle beam can upgrade treatment efficiency and have fewer side effects than X beam therapy, which is currently used in Taiwan. He said the damage done to cancerous cells by heavy-charged particle beam is several times that of other beams, but causes less pain and side effects, and does not require the patient to be hospitalized. Heavy-charged particle beam has shown good results in the treatment of liver cancer, early lung cancer, prostate cancer, bone and soft tissue tumors and head tumors, he said. However, he went on, there is no particle beam therapy in Taiwan at present and the country can learn from Japan's experience in this field for more than a decade. Jen said that



heavy-charged particle beam therapy is even better than proton beam therapy, with the damage to cancerous cell two to three times that of the proton beam or X beam therapies. The treatment process can also be shortened, he went on, citing the example of lung cancer, which requires more than 20 sessions under the present treatment, reducible to 15 sessions with proton beam treatment and only five sessions using heavy-charged particle beam treatment. The cost of the equipment for heavy-charged particle beam, however, is three times that of proton beam treatment. The equipment for proton beam treatment is around NT\$3 billion (US\$100.48 million) compared with NT\$10 billion for equipment for heavy-charged particle beam treatment. A course of proton beam treatment costs NT\$300,000, while a course of heavy-charge particle beam treatment will cost about NT\$1 million. Jen said that heavy-charged particle beam treatment can be provided for between 500 and 1,000 patients a year. Yen Sang-hue, director of the Cancer Tumor Center at Taipei Veterans General Hospital, said there are presently four heavy-charged particle beam treatment facilities in operation around the world -- one in Germany and three in Japan. Saga HIMAT, the first such center built jointly by private enterprise and local government, will open May 29, and start to accept cancer patients in July. Meanwhile, Chang Kung Memorial Hospital's Linkou branch is currently planning to set up a proton treatment center, which is scheduled to open in January 2014. Hung Chih-hung, director of the hospital's department of radiation oncology, said it will initially select six patients for treatment. Hung noted that cancer patients increase by between 80,000 and 90,000 a year in Taiwan, and between 30 and 40 percent of whom will need radiotherapy after assessment. Among them, between 6,000 and 9,000 should be able to get proton beam treatment, he said. After the center opens, he estimated, it will be able to accept between 1,600 and 1,800 patients a year.

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9. DOH unveils drug regulatory center

(Taiwan Today, 26 03 2013)

The ROC Department of Health and Tainan City-based National Cheng Kung University jointly launched the Center for Pharmaceutical Regulatory Science March 25, aiming to foster cooperation and communication in the sector between academia, government and industry. The center is a platform for integrating interdisciplinary resources, communicating pharmaceutical regulations and training research personnel, said Kang Jaw-jou, director-general of the DOH's Food and Drug Administration. Kao Yea-huei, an NCKU clinical pharmacy and pharmaceutical studies professor who doubles as the center's director, added that the CPRS aims to establish a professional research framework for pharmaceutical regulation in Taiwan and further promote drug safety and efficacy. The center's mission includes conducting academic research on pharmaceutical regulation; promoting exchanges and collaboration between local drug management agencies, their foreign counterparts and academic institutions; and providing training, Kang said. Preparations for a White Paper on the quality and safety of cosmetics, drugs and medical equipment are underway, with proposals due by the end of June, Kao said. A study on drug management is also being conducted, she added. Kang said that the DOH hopes to work with the center to give people a healthier lifestyle.

<http://www.taiwantoday.tw/ct.asp?xItem=203232&ctNode=445>

10. TSMC, Imagination announce technology tie-up

(Taiwan Today, 26 03 2013)

Taiwan Semiconductor Manufacturing Co. and Imagination Technologies from the U.K. jointly announced March 25 a collaborative technological project to boost mobile phone performance. Headquartered in Hsinchu City in northern Taiwan, TSMC is the world's leading dedicated semiconductor foundry, while Kings Langley-based Imagination is a global front-runner in creating and licensing solutions in multimedia, processor and communication technologies. The firm is also a member of TSMC's Soft-Internet Protocol Alliance program. "We are pleased to be working with Imagination to understand how best to use its PowerVR graphics processing units to work with us to optimize future generations of our most advanced process technologies and advanced system design techniques," said TSMC Vice President of R&D Cliff Ho. "Many of our licensees rely on TSMC to provide them with leading edge low power, high performance silicon foundry capabilities," said Hossein Yassaie, chief executive officer of Imagination. "We are delighted to announce our strengthening relationship with TSMC, and look forward to seeing the fruits of these projects benefitting our many mutual customers," he added. As part of the deal, the two partners will develop highly optimized reference design flows and silicon implementations using the British firm's PowerVR Series 6 GPUs combined with TSMC's manufacturing technologies, including 16-nanometer FinFET process technology. The two will jointly create fully characterized reference system designs, utilizing high bandwidth memory standards and TSMC's 3-D IC technology to demonstrate new levels of system performance and capabilities.

<http://www.taiwantoday.tw/ct.asp?xItem=203260&ctNode=445>



11. Materials Science Professor Unveils Friendlier OLED Lighting

(Central News Agency, 26 03 2013)

OLED's blanketing light is better for households than LED's spot pattern: Preliminary results of an ambitious OLED project led by materials scientist Prof. Jwo-huei Jou of the National Tsing-Hua University of Taiwan has been achieved: A small organic light emitting diode (OLED) panel emitting much friendlier correlated color temperature (CCT) than candle's 1,914 Kelvin with color rendering index (CRI) of 93, narrowly lagging the benchmark of 100 for a candle.

http://cens.com/cens/html/en/news/news_inner_42569.html

12. Taiwan, Germany to study gas hydrates in South China Sea

(Central News Agency, 26 03 2013)

Taiwan and Germany will work together on a five-week research project, starting March 31, to study gas hydrates on the seabed off southern Taiwan, with a view to developing a potentially rich energy resource, the German Institute Taipei said. The research expedition will explore and examine the ice-like mineral that is usually found on the ocean floor at depths of between 500 and 2,000 meters, according to the institute. Hydrates contain gases, such as hydrocarbons, that attach themselves inside symmetrical cages of water molecules to form hydrate crystals. "Interest in the extraction of gas hydrates is high all around the world. However, many fundamental questions about gas hydrate deposits remain open," said Christian Berndt, the research team's chief geoscientist. The project is also aimed at defining the role of plate tectonics in the formation of gas hydrates, which makes the selected site in the South China Sea ideal since it is where the Eurasian tectonic plate and the Philippine Sea plate converge, the German Institute said. Berndt said the team will use the newest geophysical methods, which could create 3-D images of the subsurface, to get estimates of how much gas hydrate is on the seabed in that area. The technology could generate data that is "10 times better than before," he said. It could also help to predict the impact of hydrate mining on the stability of the ocean floor, he added. The joint project will begin on the German research ship "Sonne" and will be followed by a second excursion in June on a brand new Taiwanese research vessel, the institute said. Germany's Federal State Ministry of Research will input funding of 1.2 million euros (NT\$46 million) for the project, while Taiwan will contribute 300,000 euros, according to the institute.

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<http://www.taiwantoday.tw/ct.asp?xItem=203298&ctNode=445>

13. Heart problems tied to blood type A: research

(Taipei Times, 01 04 2013)

People with blood type A are more susceptible to cardiovascular disease and prone to having heart attacks, according to results of a study by Taiwanese researchers at the Chang Gung Memorial Hospital. The study was conducted on 277 Taiwanese adults (men younger than 45 years and women younger than 55 years), who underwent coronary angiography (X-ray imaging of coronary arteries) at the hospital between 2005 and 2008. According to the study, patients with blood type A had a significantly greater risk of coronary artery disease (CAD) and myocardial infarction (MI), also known as heart attacks, than individuals who do not have type A blood. The result is in accordance with findings from medical teams in Europe and North America, which indicate similar risks for certain blood types, despite the different ethnic and genetic backgrounds. The findings were announced earlier in an article titled "Association of Blood Group A with Coronary Artery Disease in Young Adults in Taiwan" in Volume 15 No. 14 of the Internal Medicine Journal, a publication from the Japanese Society of Internal Medicine. For young Taiwanese adults, the study found there was a significantly different distribution for those with cardiovascular diseases (O: 30.1 percent, A: 39.7 percent, B: 26.5 percent and AB: 3.7 percent), than the control population (O: 42.6 percent, A: 24.0 percent, B: 27.1 percent and AB: 6.2 percent). According to the findings, people with blood type A are at a greater risk of cardiovascular disease and heart attack than those with non-A blood groups. Even after adjustments for common cardiovascular risk factors, such as age, gender, hypertension, cigarette smoking, diabetes, body mass index, family history and lipid profiles, the study found people with blood type A were still at an increased risk of cardiovascular disease and heart attacks. Chiu Tsung-chieh, head of Division of Transfusion Medicine at Taipei Veterans General Hospital, said other international studies had found that people with blood type A were at a greater risk of developing stomach cancer. He said the studies still require further research, but that the statistics are revealing. Ho Yi-cheng, family practitioner at Shu Tien Clinic in Taipei, said that blood groups differ by the antigens in the red blood cells. For example, people with blood type A have A antigens in their red blood cells, while people with blood type B have B antigens. "Those people with both A and B antigens are part of the AB blood group. Those people who do not have either A or B antigens are in the blood group O," he said. The study's findings are a good reminder for individuals with blood type A to take preventive measures against the onset of cardiovascular disease. Doctors recommend reducing the intake of fatty foods, eating more fruit and vegetables, taking regular exercise and avoiding smoking. In addition, people with



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blood type A who already suffer from hypertension or diabetes or who smoke or are overweight, should seek medical advice and be proactive in making lifestyle adjustments, doctors said. The different characteristics of the various blood groups have been published in medical journals. Studies have shown that O type blood does not coagulate as easily as other blood groups, thus people with blood type O should not regularly take aspirin, ginkgo biloba pills or other anti-blood clotting medicine.

<http://www.taipeitimes.com/News/taiwan/archives/2013/04/01/2003558521>