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NATURE PUBLISHING INDEX 2010 CHINA

www.natureasia.com/publishing-index/china/2010

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INTRODUCING THE NATURE PUBLISHING INDEX CHINA

BRINGING SOME OF CHINA'S BEST CENTRES OF RESEARCH TO LIGHT

David Swinbanks, Managing Director Asia and Australasia, Nature Publishing Group

Nature Publishing Group is delighted to present here for the first time the rankings of research institutions and cities in mainland China based on the Nature Publishing Index — a measure of the output of research articles in Nature journals. These rankings are based on the number of papers published in 2010, with data for 2009 also presented for comparison. Furthermore, China's performance is placed in context regionally and globally by presenting the rankings of its institutions in the Asia-Pacific index (see Asia-Pacific rankings p. 20) and in the recently released Global Top 50 Index (see www.natureasia.com/en/publishing-index/global/).

The increase in output of scientific papers from China over the past decade has been phenomenal, rising from just over 20,000 papers in 2000 to over 130,000 in 2010. In the process, China has shot past all developed nations and now lies second only to the United States.

There has been an even more dramatic rise in the numbers of papers from China published in Nature journals, rising from just six in 2000 to 149 in 2010 (see figure bottom). It should be borne in mind that even though the number of Nature primary research journals has doubled during this period from 8 in 2000 to 17 in 2010, the number of papers from China has increased 25-fold.

What the Nature Publishing Index does is take the raw data of the numbers of papers published and break them down by institution, assigning a corrected count to each paper according to the percentage of authors from that institution. The rankings are based on this corrected count. On the index website (www.natureasia.com/publishing-index), it is possible to drill down to the abstracts of the individual papers that make up the counts.

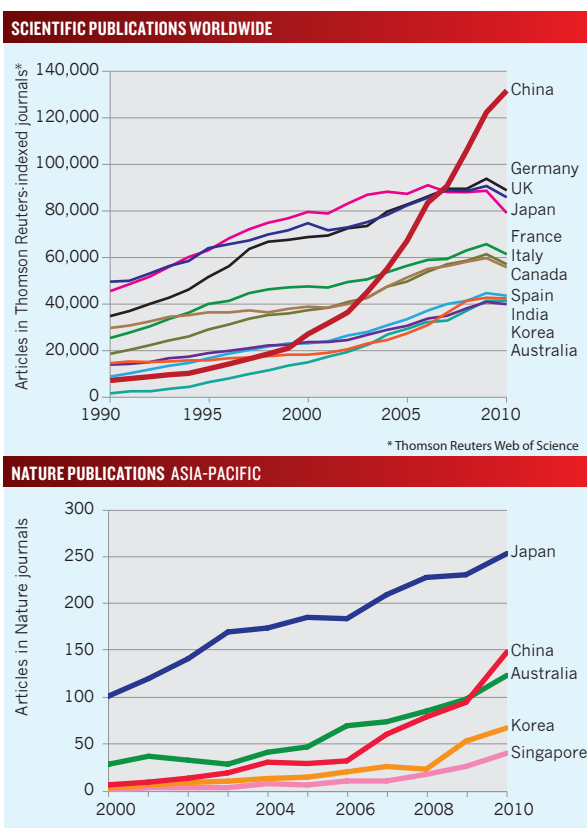
The Index offers a unique insight into some of the highest-quality basic research emerging from China. The rankings in this supplement provide snapshots of China in 2010 and 2009. To see the very latest results for China, visit the China data on the index website at www.natureasia.com/publishing-index/china. The index is updated every week with a moving window of 12 months of data.

There are many ways to assess the output and quality of research from institutions and countries, and the Nature Publishing Index is just one of these. There are also several caveats that must be applied in interpreting the index. Nature journals, although covering a broad spectrum of basic research in the life, physical, chemical and geosciences, provide relatively limited coverage of applied sciences, engineering and clinical medicine. The index should therefore be viewed primarily as an index of high-quality basic and not applied research. Having made that note, however, there are of course exceptions, such as the journals *Nature Photonics*, *Nature Materials* and *Nature Nanotechnology*, which cover both domains.

The output of an institution or country obviously depends on its size. In this regard, the Chinese Academy of Sciences, which has over 100 institutes and over 50,000 researchers, is much better placed to generate large numbers of papers than say a university, and this should be borne in mind when making comparisons with other institutions in China. In this supplement, we provide statistics on the numbers of researchers, students and faculty at each institution so readers can more easily take this factor into account.

With these caveats, we believe the index provides an extremely powerful tool to assess and find some of the best basic research coming out of China, and, because all the raw data and abstracts to the research articles behind the index website, institutions and science policy makers are free to make their own interpretations and analysis of the data generated by the index, provided they cite the index as the source.

This print publication is only intended to be a guide to the Nature Publishing Index website and how it can be used to draw results and information on China. Our interpretations and presentations of rankings should not be viewed as definitive or final. This publication is just the starting point of many different ways to interpret and mine the data on China in the index. We warmly welcome feedback (by email to index.feedback@natureasia.com), and we hope that the index will become a dynamic entity that responds to input and feedback from users. ■



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THE 2010 INDEX

CHANGING TIMES

Felix Cheung, Editor, Nature China

Science constantly brings changes to the world, but the scientific world is now undergoing one of the biggest changes in history. Emerging countries, such as China, Brazil, India and South Korea, are now challenging the traditional superpowers of science, such as the US and the UK. The scientific output of China, in particular, has experienced exponential growth in recent years. The number of primary research papers produced by Chinese institutions now exceeds the output of the UK, Germany and Japan, and is now second only to the US. Although the majority of the research work done in China is still of relatively low quality, the amount of high-quality research is growing.

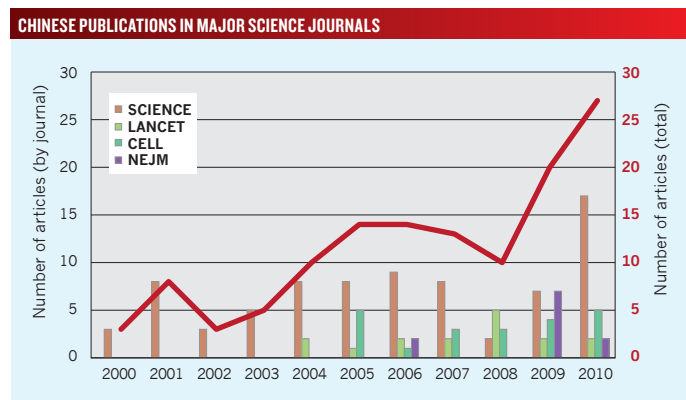
The world has witnessed remarkable changes in China. The number of Chinese papers published in Nature journals (see previous page) and other high-impact journals (see graph), the number of national and state key laboratories founded in Chinese universities, and the number of global high-tech companies and pharmaceuticals that are pouring investments into this dynamic country are increasing at a phenomenal rate. It is an amazing experience to watch these transformations unfold in such a short period of time.

China is widely recognized as the 'global factory', so it is not difficult to understand why the country is strongest in chemistry and materials research. However, China has used its national manpower and resources to its advantage and made significant progress in genetics, clinical medicine and structural biology. This clever approach has helped many Chinese institutions that had no place in science a decade ago improve their research standards, build up their reputation and develop their own areas of expertise. Cities like Shenzhen, Xiamen, Guangzhou and Tianjin have also ridden the wave of national success and quickly developed economies based on scientific and technological innovations.

China is the third-largest country in the world by area. It is one of the world's major carbon emitters, but also acts as one of the world's largest terrestrial carbon sinks. It has the Tibetan Plateau and Himalayas in the west, the Gobi desert in the north, and the East and South China Seas in the east. Mirroring this diversity, China has much to offer in terms of research on climate change, soil erosion, sand storms, tectonics, earthquakes and ocean currents.

The energy crisis and other national security problems have also prompted China to focus research on dye-sensitized solar cells, rechargeable batteries and high-temperature superconductors. With the need to stay at the forefront in information technology and communications, the country has devoted much of its resources into the development of lasers, optics and quantum information.

China has the largest population and the largest hospital network in the world, presenting obvious advantages over other countries in conducting genome-wide association studies, collecting clinical data



*Number of articles with more than 50% of the contributing authors based in mainland China (from published institutional affiliation).

and running epidemiological surveys. As a result, China now plays an increasingly important role in studies of drug safety and efficacy, hereditary diseases, cardiovascular diseases and diabetes.

In September 2010, China announced that it would double its annual budget for the Chinese Human Proteome Project at the Beijing Proteome Research Center and invest US\$180 million in a national laboratory called the 'Pilot Hub of Encyclopedical proteomix', or PHOENIX, at Peking University. The nation also plans to expand the electron microscope facility at Tsinghua University and increase the capacity for protein-structure studies at the Institute of Biophysics of the Chinese Academy of Sciences. In January 2011, China reported a commitment of US\$300 million to the Human Variome Project — an international collaboration that aims to uncover all of the genetic variations that cause human diseases. These large investments are clear indications of China's ambition and determination to stay at the forefront of biotechnology, genetics and medicine.

Many countries now recognize China's rise in scientific research. International collaboration with Chinese scientists can bring many new opportunities and benefits. By working together, China can learn the latest innovations from developed countries, and developed countries can borrow the manpower and resources of China. Language barriers and cultural differences, however, still present daunting challenges in initiating such collaboration.

The Nature Publishing Index offers a unique way to assess the high-quality research output of an institution or a city. We have analysed the index data and assessed the various strengths of each Chinese institution and city. We hope the information will give our readers some guidance and an idea of where some of the best research is being conducted in China. ■

TOP TEN INSTITUTIONS

Higher education and scientific research in China have undergone immense changes over the past 25 years. When the late leader Deng Xiaoping approved the '863 Program', his vision was to improve the overall capacity and research capability of academic institutions in the country to match world standards. The program has since evolved into Project 985 and Project 211, which aim to promote the global reputation and influence of the top 100 institutions in China and to strengthen key disciplinary areas of research to meet the economic and social needs of the twenty-first century.

Universities with 'national key disciplines' receive large amounts of funding from the government to establish research centres, build state key laboratories and recruit top talents for their selected disciplines. As a result, their contribution to innovative research and the number of publications in Nature journals are on the rise.

The Nature Publishing Index offers a unique way to assess the research output of an institution. Our analysis shows that the top ten Chinese institutions for high-quality scientific research, in descending order, are the Chinese Academy of Sciences (CAS), Tsinghua University,

the University of Science and Technology of China (USTC), BGI Shenzhen, Peking University, Nanjing University, the University of Hong Kong, Southeast University, Xiamen University and Zhejiang University. The majority of these institutions have now established their own areas of expertise. Tsinghua University, USTC, Nanjing University and Xiamen University, for example, have respectively become leaders in structural biology, physics, materials and chemistry.

We would like to point out that although the Nature Publishing Index rates the CAS as China's top research institution, the number of researchers working at the CAS is three to five times that of most universities in the country. It is therefore important to keep in mind that when making comparison between the different Chinese institutions, one must take into account the number of researchers working at the institution, data for which we have provided in this publication.

We would also like to stress that the interpretation of the index on the following pages is intended as a guide to the Nature Publishing Index and should not be viewed as definitive or final. ■

NATURE PUBLISHING INDEX CHINA

2010 RANK	INSTITUTION	CORRECTED COUNT	ARTICLES	2009 RANK	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	13.35	40	1	12.01	31
2	Tsinghua University	6.16	16	2	2.70	8
3	University of Science and Technology of China	3.73	7	3	2.67	8
4	BGI Shenzhen	3.57	9	19	0.52	1
5	Peking University	3.44	17	4	2.62	8
6	Nanjing University	3.09	7	7	1.41	5
7	The University of Hong Kong	2.17	8	8	1.29	4
8	Southeast University	2.05	3	-	-	-
9	Xiamen University	1.83	3	10	1.00	1
10	Zhejiang University	1.65	12	14	0.66	4



HOW TO READ THE NATURE PUBLISHING INDEX CHINA

The Nature Publishing Index China is a ranking based on the number of primary research articles published in the Nature family of journals by institutions and cities in mainland China and Hong Kong. The ranking is based on a corrected count that takes into account the fractional contribution of an institution or a city (by author affiliation) to each published article. The fractional counts are then tallied for the designated period. Only articles printed in the ranking period are included in the calculation of the index (advance online publications are not included until assigned an issue number and sent to press). The Nature Publishing Index China 2010 is based on frozen data for the calendar year 2010: January 1 to December 31.

The Nature Publishing Index China is based on affiliation data drawn from Nature journal articles published on nature.com. There is great variability in the way authors present their affiliations. Every effort is made to count affiliations in a consistent way making reasonable assumptions to determine corrected counts and these assumptions are explained on the website. As such, corrected counts are approximations based on these assumptions and no counts are definitive.

THE CHINESE ACADEMY OF SCIENCES (CAS)

STRENGTH IN NUMBERS

CORRECTED COUNT: 13.354 ARTICLES: 40

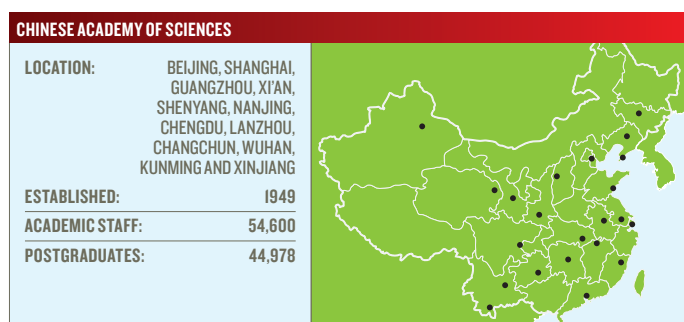
Despite intense domestic and international competition, the Chinese Academy of Sciences (CAS) is contributing more primary research articles to Nature journals than ever before. According to the Nature Publishing Index 2010, the national premier academic institution maintains its position of leadership in the China rankings and is now fourth in the Asia-Pacific rankings behind the University of Tokyo, RIKEN and Kyoto University (see p. 20). The CAS is ranked 32nd on the Nature Publishing Index Global Top 50, ahead of Osaka University in Japan, Princeton University and the University of Maryland in the USA and Imperial College London in the UK — it is also the only Chinese academic institution present in the Global Top 50.

Founded in 1949 and headquartered in Beijing, the CAS has branch offices in 11 cities — Shanghai, Guangzhou, Xi'an, Shenyang, Nanjing, Chengdu, Lanzhou, Changchun, Wuhan, Kunming and Xinjiang — and more than 100 affiliated institutes dotted throughout the country. In addition, the CAS has two affiliated universities, namely the University of Science and Technology of China and the Graduate University of the Chinese Academy of Sciences. The CAS represents the world's largest science and technology research organization with close to 100,000 professionals, including staff, technicians and students, conducting research in frontier areas of basic and applied sciences.

This year, CAS researchers have contributed 40 articles with a corrected count (CC) of 13.35 to Nature journals, including 14 (CC 2.92) to the flagship title *Nature*. The published research spans all disciplines of science, with 22 articles (CC 6.21) in life sciences, 13 (CC 5.34) in physical sciences, three (CC 0.85) in palaeontology and two (CC 0.96) in earth sciences.

Our analysis shows that the research strengths of the CAS lie in physics, structural biology, genetics and chemistry. The CAS published more articles in *Nature Structural & Molecular Biology* than any other Asia-Pacific institution in 2010, and ranks second in the region in contributions to *Nature Physics*. The organization also takes fourth position in the Asia-Pacific journal rankings for *Nature* and *Nature Genetics*. The CAS has traditionally been a strong player in palaeontology and neurosciences, but the number of articles in these fields has decreased slightly compared to 2009. Nevertheless, the CAS is still the second-most published Asia-Pacific institution in *Nature Neuroscience*.

Although the CAS has more than 100 affiliated institutes scattered across the country, only 27 of these have made their names onto the pages of Nature journals in 2010: 16 in Beijing, six in Shanghai, two in Kunming, one in Fuzhou and one in Chengdu. The top five affiliated institutes with the largest contribution to Nature journals are the Institute of Physics, the Shanghai Institutes for Biological Sciences, the Institute of Biophysics, the Institute of Vertebrate Paleontology and Paleoanthropology, and the Fujian Institute of Research on the Structure of Matter.



The growing contribution of the CAS to Nature journals is a positive sign of emerging innovation. However, if we take into account the scale of the organization and the number of researchers, there is still much room for improvement before the CAS can truly reflect its power and influence on the world stage. ■

NATURE PUBLISHING INDEX GLOBAL TOP 50

RANK	INSTITUTION	COUNTRY	CORRECTED COUNT	ARTICLES
1	Harvard University	USA	72.72	238
2	Centre National de la Recherche Scientifique	France	55.22	182
3	Max Planck Institutes	Germany	50.37	157
4	Stanford University	USA	44.09	101
5	Massachusetts Institute of Technology	USA	35.91	82
6	The University of Tokyo	Japan	34.33	80
7	National Institutes of Health	USA	32.70	107
8	Yale University	USA	29.72	67
9	California Institute of Technology	USA	28.57	71
10	Columbia University	USA	28.28	67
23	RIKEN	Japan	18.24	50
25	Kyoto University	Japan	16.98	36
32	Chinese Academy of Sciences	China	13.35	40
33	Osaka University	Japan	13.27	34

The data for the Global Top 50 is drawn from the beta website of the Nature Publishing Index Global Top 50 (www.natureasia/publishing-index/global). We welcome feedback from readers on the website and the way results are presented.

Results for organizations that include numerous sub-entities (e.g. the Max Planck Institutes) are presented as aggregates of all contributing entities in the beta index. An exception to this rule is the University of California System, for which each of the ten universities of the system are presented individually. On aggregate count, the University of California System has a corrected count in excess of 100 and would be ranked number one.

The Nature Publishing Index Global Top 50 is produced in collaboration with Digital Science (www.digital-science.com), a division of Macmillan Publisher Ltd, owner of Nature.

TSINGHUA UNIVERSITY

LEADING THE UNIVERSITY PACK

CORRECTED COUNT: 6.155 ARTICLES: 16

Founded in 1911, Tsinghua University is situated in the Haidian District of Beijing, close to Old Summer Palace and Peking University. Water features, shady trees and historical architectures create a calming atmosphere, making Tsinghua University one of the beautiful university campuses in the world. Every year, Tsinghua University produces thousands of graduates, many of whom go on to become distinguished scholars and leaders in all walks of life.

This year, the Nature Publishing Index ranks Tsinghua University as the top research university in China. Long regarded as China's most prestigious university, Tsinghua University has secured second place in the China rankings in 2010 and moved a long way ahead of its domestic competitors on corrected count. On the Asia-Pacific rankings, Tsinghua University has leapt from 17th to seventh ahead of Nagoya University in Japan, A*STAR in Singapore and Seoul National University in Korea (see p. 20).

This year, Tsinghua University has contributed 16 articles (CC 6.16) to Nature journals, including five (CC 2.78) to *Nature*. With highly distinguished structural biologists like Yigong Shi, Nieng Yan and Xinquan Wang stationed at the School of Life Sciences, it should come as no surprise that more than half of Tsinghua University's publications in Nature journals are in the field of structural biology.

TSINGHUA UNIVERSITY	
LOCATION:	BEIJING
ESTABLISHED:	1911
ACADEMIC STAFF:	7,186
POSTGRADUATES:	22,017

These researchers have caught on to the trend of studying transporter proteins — a topical area that has captured the interest of Nature journal editors.

Over the past few years, the majority of articles that Tsinghua University researchers have published in Nature journals have been in the life sciences. Historically, however, Tsinghua University has produced many high-caliber physicists, most notably the 1957 Nobel laureates Chen Ning Yang and Tsung Dao Lee. In 2010, Tsinghua University has made a comeback by publishing four (CC 1.39) articles in physics, up from a single article the year before. Despite the growth, however, Tsinghua University's share of authorship in each of these articles remains small, ranging from 13% to 57%. ■

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA

A LEADING LIGHT

CORRECTED COUNT: 3.725 ARTICLES: 7

The University of Science and Technology of China (USTC) was founded in Beijing by the CAS in 1958 and relocated to Hefei — the capital city of Anhui Province — in 1970 during the Cultural Revolution. The USTC is a member of the country's prestigious 'C9 league' universities and one of only two universities that is under the administration of the CAS. Because of its special connection with the CAS, the USTC has received full support from the government since its founding. The USTC is the only university in China with two national facilities — the National Synchrotron Radiation Laboratory and the Hefei National Laboratory for Physical Sciences at the Microscale (HFNL). Jianguo Hou, who established the HFNL in 2003, is now president of the USTC.

The USTC places a strong emphasis on basic research and has a solid reputation in physics. Guangcan Guo, who established the Laboratory of Quantum Communication and Quantum Computation (now the Key Laboratory of Quantum Information) in 1999, and Jianwei Pan, who has reported a series of experiments on quantum entanglement in *Nature* since 1997, as well as Hou himself are some of the key figures responsible for this reputation.

Tsinghua University may well be China's leading university in life sciences, but when it comes to physical sciences, the USTC wins hands down. This year, the USTC has contributed seven (CC 3.73) articles to Nature journals, all related to quantum physics and condensed matter

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA	
LOCATION:	HEFEI
ESTABLISHED:	1958
ACADEMIC STAFF:	3,600
POSTGRADUATES:	13,794

physics. Guo and Hou each published one wholly authored (CC 1.0) article in *Nature Communications* and *Nature Photonics*, respectively. Pan contributed three (CC 1.51) articles to Nature journals, including two articles in *Nature Photonics* and one in *Nature Physics*. Overall, the USTC is the leading contributor to *Nature Photonics* in the Asia-Pacific region.

Although the total number of articles has decreased by one compared to 2009, the USTC hangs on to third position in the China rankings by having a higher share of authorship in each article. The result is encouraging and suggests that researchers at the USTC are becoming capable of doing high-quality research on their own. The USTC has enjoyed steady publication growth and has improved from 18th to 16th in the Asia-Pacific rankings (see p. 20). ■

BGI SHENZHEN

TAKING THE WORLD BY STORM

CORRECTED COUNT: 3.572 ARTICLES: 9

One particular thing that stands out in the Nature Publishing Index 2010 is the number of articles published in the Nature journals by BGI Shenzhen — the premier genomics institute in China. In 2010, the former Beijing Genomics Institute contributed nine articles (CC 3.57) to Nature journals, with the majority of these in genetics and biotechnology. BGI Shenzhen is now ranked second and third in the Asia-Pacific region on contributions to *Nature Biotechnology* and *Nature Genetics*.

The story of success began in 2001 when Huanming Yang — the founder of the Beijing Genomics Institute in Beijing — published his first paper in *Nature* on the sequencing of the human genome. At that time, the institute claimed only 1% of the authorship; the overwhelming majority of authors were from universities in the USA, the UK and Germany. However, the milestone event helped convince the CAS and other sources to pour funding into the emerging institute. In 2006, lured by incentives from the Shenzhen government, the institute moved to Shenzhen, where it was refounded as BGI Shenzhen in 2007.

This year, BGI Shenzhen published results on the genomes of soybean, the giant panda, maize and an ancient human, as well as silkworm methylome, human exome and gut metagenome in Nature journals. The share of authorship in each of these articles ranges from 5% to 74%. As a result, BGI Shenzhen has moved from 19th to fifth in

BGI SHENZHEN	
LOCATION:	SHENZHEN
ESTABLISHED:	2007
ACADEMIC STAFF:	3,000
POSTGRADUATES:	UNDISCLOSED

the China rankings and skyrocketed from 100th to 17th in the Asia-Pacific rankings ahead of Peking University, Nanjing University and other long-time domestic leaders (see p. 20).

BGI Shenzhen recently received a US\$1.5 billion loan from the China Development Bank and is planning to purchase additional sequencing machines from Illumina to support greater collaboration with universities and companies. With the new funding, BGI Shenzhen aims to sequence the genomes of 1,000 plants and animals within the next two years. Today, BGI Shenzhen has branch offices in Europe and America and is one of the global leaders in genomics. Expect BGI Shenzhen to continue its growth in contributions to Nature journals in the coming years. ■

PEKING UNIVERSITY

STRENGTH IN BREADTH

CORRECTED COUNT: 3.440 ARTICLES: 17

Peking University and Tsinghua University are widely regarded as the most elite universities in China. Whilst there has been much debate over which university is the better of the two, the majority of students would agree that both universities are equally prestigious and difficult to enter. People often compare the rivalry between Peking and Tsinghua to that of Oxford and Cambridge. Like the saying “Oxford for arts, Cambridge for sciences” goes, there is even a common impression that Peking University is stronger in politics and social sciences, while Tsinghua University is stronger in the sciences and engineering.

The Nature Publishing Index 2010 shows that there might be some truth in this common saying. In 2010, Peking University contributed a record 17 articles (CC 3.44) to Nature journals, including five articles in *Nature*. Peking University ranks second in the China rankings on the number of articles published in Nature journals, just one article ahead of Tsinghua University. In terms of corrected count, however, Peking University ranks fifth in the China rankings, falling well behind Tsinghua University.

The published research spans a wide range of disciplines, with Peking University publishing 12 articles (CC 1.71) in life sciences, four (CC 1.53) in physical sciences and one (CC 0.2) in earth sciences. The university is now the third-ranked Asia-Pacific institution on contribution to *Nature Cell Biology*.

PEKING UNIVERSITY	
LOCATION:	BEIJING
ESTABLISHED:	1898
ACADEMIC STAFF:	4,206
POSTGRADUATES:	15,039

The breadth of disciplines strongly reflects the diversity of top scientists working at Peking University. However, Peking University lacks a strong ‘identity’ — a key discipline that the university excels in — and instead is achieving a solid but not outstanding performance in many fields. This is unlike other universities in China that have chosen to try and excel in particular fields. It is early days yet and the jury is still out on which is the best approach to adopt.

The low corrected counts suggest that Peking University is relying on external (including international) collaboration to publish high quality research, whereas other universities in China have developed strong in-house teams. Again it remains to be seen which approach is best but this does tend to lower Peking University’s ranking. ■

NANJING UNIVERSITY

A SOLID PERFORMER

CORRECTED COUNT: 3.088 ARTICLES: 7

Nanjing University has been recognized as one of the key Asia-Pacific institutions for cutting-edge research in materials science, solid-state physics and condensed matter physics ever since it established the National Laboratory of Solid State Microstructures (NLSSM) in 1984. In fact, the research output from the NLSSM is so high that almost the entirety of Nanjing University's publication in Nature journals revolves around solid materials.

Founded in 1902, Nanjing University is located in the heart of Nanjing, an ancient capital approximately 280 kilometres north-west of Shanghai. In 2010, Nanjing University climbs from seventh to sixth in the China rankings with seven articles (CC 3.09)

THE UNIVERSITY OF HONG KONG

EYE ON INFLUENZA

CORRECTED COUNT: 2.172 ARTICLES: 8

In 2010, the University of Hong Kong (HKU) outperformed itself by doubling its contribution to Nature journals. With eight articles (CC 2.17) up its sleeve, the university maintains its leadership in the city it was named after and sits safely in seventh place in the China rankings. The contribution from HKU to Nature journals is now two to three times that of Hong Kong Polytechnic University, the Hong Kong University of Science and Technology, the Chinese University of Hong Kong or any of its local rivals.

With severe acute respiratory syndrome (SARS), avian flu and swine flu still in the recent memories of the Hong Kong people, it should come as no surprise that infectious diseases and microbiology

SOUTHEAST UNIVERSITY

OUT OF NOWHERE

CORRECTED COUNT: 2.049 ARTICLES: 3

Founded in 1902 and located in Nanjing, Southeast University is one of 32 national universities under the administration of the Ministry of Education. It is one of the oldest universities in China and shares the same heritage as Nanjing University.

Describing the performance of Southeast University in the China rankings as unexpected would be no exaggeration. In 2007, Southeast University made its debut in Nature journals by publishing its first article in *Nature Nanotechnology*. At that time, only two of the 11 authors responsible for producing the paper were from Southeast University. Since then, Southeast University has had no contribution to any of the Nature family of journals.



in Nature journals — all but one related to solid materials. The NLSSM and its spin-off, the Nanjing National Laboratory of Microstructures, are responsible for producing four of these articles, two-thirds of Nanjing University's contribution to Nature journals by corrected count.

The research published by Nanjing University covers all areas of materials science, ranging from biomaterials to composites, optical materials to superconductors. The top three articles with the highest share of authorship are published in *Nature Materials*, *Nature Nanotechnology* and *Nature Communications*. ■



are key areas of interest and strength at HKU. Kwok Yung Yuen at the Department of Microbiology is responsible for contributing the article with the highest share of HKU authorship to Nature journals in 2010.

Something unusual about HKU this year is the dramatic rise in high-quality research in earth sciences. HKU contributed three articles (CC 0.72) in earth science to Nature journals, including two to *Nature* and one to *Nature Geoscience*, on topics related to climate change and biodiversity. With the newly launched *Nature Climate Change*, we are eager to see if HKU can outperform itself again in 2011. ■



In 2010, however, Southeast University published three articles (CC 2.05) in Nature journals, including one article on the panda genome in *Nature* and two wholly authored articles on metamaterials in *Nature Communications*. Metamaterials are artificially engineered materials with remarkable optical properties. Tiejun Cui and Huifeng Ma at the State Key Laboratory of Millimetre Waves reported the use of metamaterials to make invisibility cloaks and three-dimensional lenses in *Nature Communications*, and because of their effort, Southeast University this year commands second place in the Asia-Pacific rankings for that journal (see www.natureasia.com/en/publishing-index/asia-pacific/2010/). ■

XIAMEN UNIVERSITY

THE RIGHT CHEMISTRY

CORRECTED COUNT: 1.829 ARTICLES: 3

Trailing behind Southeast University is Xiamen University, a contender that is making its way into the top ranks of the Nature Publishing Index China. Founded in 1921 and celebrating its 90th anniversary in 2011, Xiamen University is situated in the coastal city of Xiamen approximately an hour by plane from either Shanghai or Hong Kong. With a total of three articles (CC 1.83) published in Nature journals in 2010, Xiamen University has managed to improve its placement from tenth to ninth in the China rankings.

Xiamen University made its debut in Nature journals in 2008 with two papers — an article by Shengcai Lin at the School of Life Sciences in *Nature Chemical Biology* and a wholly authored article in *Nature*

ZHEJIANG UNIVERSITY

RISING UP THE RANKS

CORRECTED COUNT: 1.650 ARTICLES: 12

Zhejiang University published 12 articles (CC 1.65) in Nature journals in 2010, including three (CC 0.5) in *Nature*. A dramatic increase in the number of articles, from just four in 2009, has driven Zhejiang University from 14th to tenth in the China rankings. The published research covers the full gamut of science with a bias towards life sciences. Eight (CC 1.25) of the articles published in 2010 were in life sciences, and the other four (CC 0.4) were in physical sciences.

Founded in 1897, Zhejiang University is located in Hangzhou, one of China's most important tourist cities. With the city's pleasant climate and West Lake's picturesque surroundings, Zhejiang University is one of the best places in the country for learning and conducting research.

REGIONAL ROUNDUP

THE UPS AND DOWNS

The Nature Publishing Index 2010 shows that the year was a fruitful one for China, which can now count 110 institutions that have made it into Nature journals — 33 more than the previous year. Of all the institutions that appeared in the China rankings in 2009, 40% had a greater contribution to Nature journals this year, compared with 14% with a lesser contribution, 3% that remained unchanged, and 43% that did not make it into the rankings in 2010.

Shanghai Jiao Tong University experienced the biggest drop of all, declining from ten articles (CC 1.76) in 2009 to two (CC 0.05) in 2010, precipitating a fall from fifth to 64th in the China rankings. Shenyang

XIAMEN UNIVERSITY	
LOCATION:	XIAMEN
ESTABLISHED:	1921
ACADEMIC STAFF:	2,475
POSTGRADUATES:	18,073

Materials by Suyuan Xie at the university's Department of Chemistry. In the following year, Lin contributed a wholly authored article to *Nature Cell Biology*. In 2010, Xie contributed a wholly authored article to *Nature Chemistry*, making Xiamen University fourth on contributions to the title in the Asia-Pacific region. An interesting characteristic of Xiamen University is that the majority of its publications in Nature journals are '100% made in Xiamen' — a characteristic reflecting the city's relative isolation from major centres in the country.

The research strength of Xiamen University appears to lie in chemistry, which is not surprising given that the field is one of Xiamen University's national key disciplines. ■

ZHEJIANG UNIVERSITY	
LOCATION:	HANGZHOU
ESTABLISHED:	1897
ACADEMIC STAFF:	8,241
POSTGRADUATES:	20,811

In terms of the number of articles published, Zhejiang University represents one of the top contributors to Nature journals in China, trailing only the CAS, Peking University and Tsinghua University. In terms of corrected count, however, Zhejiang University ranks below Southeast University and Xiamen University, but rises above Second Military Medical University and Fudan University. The result shows that Zhejiang University has been joining forces with the global community in conducting high-quality research on a breadth of topics. The university will therefore need to put in extra effort in order to generate work that is truly its own, and in so doing make its way toward the top of the China rankings on the Nature Publishing Index. ■

Normal University, the Polar Research Institute of China and Nanjing Normal University are some of the notable dropouts this year. These universities appeared in China's top 20 in 2009 but did not return to the chart in 2010.

In terms of growth, BGI Shenzhen takes the lead with a 6.8-fold increase in its contribution to Nature journals in 2010 compared with 2009. Zhejiang, Tsinghua, Nanjing and Xiamen universities have also improved significantly with an increase of 1.8–2.5 times over the result for 2009. Southeast University can be awarded 'most improved' for the year, as it did not make the list in 2009 but is in China's top ten in 2010. ■

TOP TEN CITIES

Many people are aware of the rapid growth of China's research output, but not of the dramatic changes that are happening within the country itself. The Nature Publishing Index offers a unique way to assess the research output of a city. Our analysis shows that the top ten Chinese cities for high-quality basic research, in descending order, are Beijing, Shanghai, Nanjing, Hefei, Hong Kong, Shenzhen, Xiamen, Hangzhou, Guangzhou and Tianjin. Not only do these ten cities account for approximately 88% of China's contribution to Nature journals in 2010, they also mark the locations of all of the top 20 institutions in the China rankings. The findings will give researchers, business leaders and science policy makers a greater insight into China's emerging cities of scientific innovation.

NATURE PUBLISHING INDEX CHINA

2010 RANK	CITY	CORRECTED COUNT	2009 RANK	CORRECTED COUNT	2010 RANK	CITY	CORRECTED COUNT	2009 RANK	CORRECTED COUNT
1	Beijing	23.07	1	16.58	11	Chengdu	0.84	13	0.24
2	Shanghai	8.78	2	9.76	12	Fuzhou	0.84	27	0.06
3	Nanjing	6.30	5	1.91	13	Xi'an	0.84	-	-
4	Hefei	5.10	3	4.09	14	Jinan	0.65	22	0.12
5	Hong Kong	4.74	4	2.56	15	Zhengzhou	0.59	-	-
6	Shenzhen	3.65	9	0.55	16	Shenyang	0.55	7	0.96
7	Xiamen	1.83	-	-	17	Kunming	0.50	30	0.03
8	Hangzhou	1.70	8	0.66	18	Wuhan	0.47	10	0.4
9	Guangzhou	1.38	25	0.07	19	Pingyi	0.33	12	0.25
10	Tianjin	1.29	19	0.14	20	Suzhou	0.29	14	0.24

BEIJING

CORRECTED COUNT: 23.07
POPULATION: 12.4 MILLION
GDP PER CAPITA: RMB 97,536



Beijing, the capital city of China, is not only the centre of politics, arts and culture, but also the centre of high-quality scientific research. The result is not surprising considering that Beijing is home to the Chinese Academy of Sciences (CAS) — the national premier research organization — and most of its affiliated institutes. Tsinghua and Peking University, widely regarded as China's two most prestigious universities, are also located here.

In addition, thousands of multinational enterprises and pharmaceutical companies have taken root in Zhongguancun, a technology hub situated in the Haidian District of Beijing. Many of these enterprises and companies have set up their own research and development centres in Beijing or established collaborations with one of the city's research institutions.

The research institutions in Beijing that have made it into China's top 20 on the Nature Publishing Index 2010 include the CAS, Tsinghua University, Peking University and the National Institute of Biological Sciences. Within the CAS, the Institute of Physics and the Institute of Biophysics are two Beijing-based institutes that contribute to Nature journals on the same level as any of the top 20 institutions in China. ■

SHANGHAI

CORRECTED COUNT: 8.78
POPULATION: 14 MILLION
GDP PER CAPITA: RMB 107,478



Shanghai is the largest and the most populous city in China. It is also the centre of economy, finance and international trade. Some of the country's

tallest buildings stand here, providing the city with its characteristic skyline.

Shanghai is also the national pillar of drug research and development. Many large pharmaceutical companies set up their regional headquarter, representative offices and research centres in Shanghai, and there are many experienced pathologists, toxicologists, chemists and clinicians working in the city. The Shanghai Institutes for Biological Sciences, the top research institute for life sciences in China and an affiliate of the CAS, is also located here.

According to the Nature Publishing Index 2010, the research institutions in Shanghai that have made it into China's top 20 include the Second Military Medical University, Fudan University, the Shanghai Cancer Institute and GlaxoSmithKline Research and Development Center. Almost all Nature papers produced by these research institutions are in the life sciences, covering the areas of biotechnology, cell biology, genetics and cancer biology. ■

NANJING

CORRECTED COUNT: 6.30
POPULATION: 6.3 MILLION
GDP PER CAPITA: RMB 67,142



Nanjing used to be the capital of China before 1949, but has since transformed into a centre of education, transportation and tourism. It is an important production base for a comprehensive range of products, including electronics, chemicals and building materials. Despite being a second-tier city, Nanjing boasts some of the country's most prominent academic institutions.

According to the Nature Publishing Index 2010, the research institutions in Nanjing that have made it into China's top 20 include Nanjing University, Southeast University and Nanjing Medical University. Nanjing and Southeast universities are both leading institutions in materials research, whereas Nanjing Medical University places its research emphasis on biomedical research. ■

HEFEI

CORRECTED COUNT: 5.10
POPULATION: 4.9 MILLION
GDP PER CAPITA: RMB 42,810



Hefei, the capital of Anhui Province, is an inland city that is most famous for science and education. Despite being a third-tier city, Hefei ranks as one of the most important cities for scientific and technological innovation in China, trailing only Beijing, Shanghai and Nanjing.

According to the Nature Publishing Index 2010, the University of Science and Technology of China (USTC) and Anhui Medical University are the only two research institutions in Hefei that have made it into China's top 20. The USTC, one of only two universities under the administration of the CAS, is the national leader in physical sciences, while Anhui Medical University is the leading institution in medical genetics research, particularly dermatology. ■

HONG KONG

CORRECTED COUNT: 4.74
POPULATION: 7 MILLION
GDP PER CAPITA: HKD 247,241



Hong Kong, a former British colony, was and still is China's gateway to the world. It is home to the University of Hong Kong (HKU), the Chinese University of Hong Kong, the Hong Kong University of Science and Technology and a number of world-renowned universities that have a proven record of accomplishment in scientific research.

Hong Kong is also the city that had the first outbreak of avian flu H5N1 virus in 1997 and severe acute respiratory syndrome (SARS) in 2003. For this reason, the city has shifted much of its research focus into infectious diseases and microbiology.

According to the Nature Publishing Index 2010, the research institutions in Hong Kong that have made it into China's top 20 include the HKU and Hong Kong Polytechnic University. The most representative paper produced by HKU this year was an article published in *Nature Biotechnology* on the discovery of influenza nucleoprotein. ■

SHENZHEN

CORRECTED COUNT: 3.65
POPULATION: 8.9 MILLION
GDP PER CAPITA: RMB 92,042



Shenzhen is one of the earliest special economic zones — and arguably the most successful one — in China. The city has attracted a great deal of investment from high-tech companies, especially those in information technology, microelectronics, pharmaceuticals and biotechnology, after Deng Xiaoping made his highly publicized 'inspection tour' in January 1992. High-quality innovative research was unheard of in Shenzhen until the city published its first article in *Nature* in 2006. Since then, Shenzhen has enjoyed remarkable growth in the publication of original research in some of the world's most respected journals.

According to the Nature Publishing Index 2010, BGI Shenzhen is the only Shenzhen-based research institution to make it into China's top 20. Despite being the sole institution on the list, the strong performance of BGI Shenzhen in genetics research is enough to elevate Shenzhen from ninth most important research city in China in 2009 to sixth in 2010. ■

XIAMEN

CORRECTED COUNT: 1.83
POPULATION: 1.7 MILLION
GDP PER CAPITA: RMB 98,135



Once known as Amoy in the West, Xiamen is a beautiful coastal city located on the rim of Fujian Province. This city's long beaches, pleasant climate and natural scenery make it a popular tourist destination. Xiamen University, hailed as one of the most beautiful universities in China, sits in a prime location facing the sea and is the only research institution in Xiamen to make China's top 20 in the Nature Publishing Index 2010. The university's Nature publications have been growing steadily at approximately 25% a year over the last five years, with chemistry and cell biology being its greatest research strengths. ■

HANGZHOU

CORRECTED COUNT: 1.70
POPULATION: 6.8 MILLION
GDP PER CAPITA: RMB 74,494



Known as the 'City of Heaven', Hangzhou is the capital of Zhejiang Province and one of China's most important tourist cities. It is home to Zhejiang University, one of China's oldest and most prestigious institutions for higher education and a member of the 'C9 league'. Zhejiang University is also the only research institution in Hangzhou to make it into China's top 20 in 2010. The research published by Zhejiang University spans a wide range of scientific disciplines, from structural biology to immunology and from material physics to quantum physics. ■

GUANGZHOU

CORRECTED COUNT: 1.38
POPULATION: 7.9 MILLION
GDP PER CAPITA: RMB 114,943



Guangzhou, the capital of Guangdong Province, is the third-largest city in China and a major seaport with great historical importance. It is the location of the annual Canton Fair — one of the world's largest trade fairs — that is held by the Ministry of Commerce to help establish bilateral trade relations between China and other countries. Sun Yat-sen University is the only research institution in Guangzhou to appear in China's top 20 in the Nature Publishing Index 2010. The university contributed seven articles to Nature journals in 2010, all in life sciences — specifically genetics and cell and molecular biology. ■

TIANJIN

CORRECTED COUNT: 1.29
POPULATION: 9.8 MILLION
GDP PER CAPITA: RMB 76,755



Located 100 kilometres east of Beijing, Tianjin is the sixth largest city in China and a city that is undergoing dramatic changes. Together with Beijing, Shanghai and Chongqing, Tianjin is one of four municipalities that are under the direct administration of the central government. Nankai University is the only research institution in Tianjin to make China's top 20, ranked 14th in the country with four articles in Nature journals, including a wholly authored article in *Nature Chemistry*. ■

USING THE NATURE PUBLISHING INDEX

HOW TO FIND THE INFORMATION YOU NEED

www.natureasia.com/publishing-index

The Nature Publishing Index is maintained by Nature Publishing Group (NPG), a division of Macmillan Publishers that publishes *Nature*, the international science weekly, and over 30 Nature-branded primary research and review journals covering a broad spectrum of the life sciences, physical and chemical sciences, and clinical medicine. Nature journals are among the most highly cited journals in the scientific literature and are renowned for their publication of high-quality, high-impact research.

The index allows institutions and countries/territories to be ranked according to the number of primary research articles they publish in the Nature family of journals in a one-year period. The index presents both raw numbers of articles with author affiliations to a given country or institution, and a *corrected count* that is adjusted according to the relative contribution of each author to each published article based on the percentage of authors from that institution or country in the affiliations of the paper. This corrected count is tallied over a one-year period and used to rank the institutions and countries according to their contribution to Nature journals. Only articles printed in the ranking period are included in calculation of the index—advance online publications are not included in the index until assigned an issue number and sent to press. The Nature Publishing Index 2010 Asia-Pacific is for the calendar year 2010: January 1 to December 31.

The index, online at www.natureasia.com/publishing-index, is updated every week with a moving window of one-year of data. The index website provides links to the abstracts of all articles used to calculate corrected counts, providing the details of individual papers and authors contributing to an institution or country's rank in the index and making the index fully transparent.

The index website also provides data for review articles published in Nature journals for the Asia-Pacific region. Review articles, however, are not included in the annual rankings because reviews are commissioned by Nature journal editors rather than being papers submitted by researchers. ■

NATURE PUBLISHING INDEX ASIA-PACIFIC

The Asia-Pacific index is updated weekly and includes articles published in the latest issues of the Nature journals. Users of the index website can subscribe for weekly email alerts to keep up to date with the latest results from the region. A print publication presenting the frozen data for each calendar year is published annually. ■

NATURE PUBLISHING INDEX GLOBAL TOP 50

A new addition to the Nature Publishing Index website in 2011 is the beta website of the Global Top 50—an index of the top 50 institutions based on publications in *Nature* and the Nature research journals. The Global

Top 50 index is updated annually and is currently in the beta stage of development as the algorithms that underlie the index calculations and determine affiliations undergo continued improvements for accuracy. ■

CORRECTED COUNT

The Nature Publishing Index is based on an article's *corrected count*—a calculation that takes into account the number of affiliated institutions per author and the percentage of authors per institution. All authors are considered to have contributed equally to each article. The maximum corrected count for any article is 1.0. The corrected count for a country/territory reflects the total corrected count for all institutions based in that region. The rules governing the calculation of corrected counts with respect to the way affiliations are presented are adjusted regularly to account for new scenarios.

The Nature Publishing Index is based on affiliation data drawn from Nature journal articles published on nature.com. There is great variability in the way authors present their affiliations. Every effort is made to count affiliations in a consistent way making reasonable assumptions to determine corrected counts and these assumptions are explained on the index website. As such, the corrected counts are approximations based on these assumptions and no counts are definitive. ■

RANKINGS, GRAPHS AND LISTS

COUNTRY RANKINGS

Countries and territories are ranked according to corrected count and can also be filtered by article type using the selector at the top of the page. Clicking on a country name will display a list of institutions within that country/territory. ■

INSTITUTION RANKINGS

The institutional rankings track institutions in the Asia-Pacific region (including India and Australasia) according to corrected count. Data for primary research articles (Articles & Letters), reviews, or a combination of both, can be viewed by selecting the appropriate tab in the article filter at the top of the page. By default, the top 25 institutions are listed; clicking on 'Show all' at the bottom of the list will display all of the institutions. Clicking on the number in the 'Articles' column displays a list of all the articles from that particular institution.

Global institutional rankings are also available under the beta website of the Global Top 50. The global index page shows the list of institutions ranked by corrected count, and the list of Nature articles contributing to the corrected count can be accessed by clicking on the number in the 'Articles' column. ■

RANKINGS BY NATURE JOURNAL

The journal rankings group all articles from the Asia-Pacific region according to Nature research journal, and can be filtered by article type. By default, the top five institutions are listed for each journal. Clicking on 'Show All' lists all of the institutions from the Asia-Pacific that have affiliations listed in that journal, and clicking on the number of articles displays a list of the articles from that journal with affiliations from that institution. ■

HISTORICAL RANKINGS

The historical rankings track data by Asia-Pacific country for primary research articles (reviews are not included) back to 2000. Clicking on the year at the top of the table will display the rankings for that year based on the corrected count. ■

HISTORICAL GRAPHS

These graphs provide a visual representation of the historical data based on primary research articles (only). By default, the top five countries are displayed but users can freely select or deselect the countries of their choice. The graph is redrawn after a change in selection. By default, data for the corrected count is displayed; however, data for the number of articles can also be selected. Clicking on 'Show Data' will display the numerical values (rounded to the closest whole number) along the line graph. ■

LATEST RESEARCH

The latest research section provides a breakdown of the latest publications in Nature journals from the Asia-Pacific region by country/territory, including journal name and article title. ■

HOW TO READ THE INDEX

ARTICLE FILTER

The index primarily tracks research articles, but data on reviews is also available. At the top of most ranking lists there is an article filter. Since the index focuses on primary research articles, the tab for 'Articles & Letters' is selected by default. However, clicking on 'Reviews' displays data for review articles, while clicking on 'All' displays both primary research articles and reviews.

Articles & Letters	Reviews	All
Institution	Corrected Count ²	Articles ³
1. The University of Tokyo, Japan	33.67	82
2. RIKEN, Japan	18.18	47
3. Kyoto University, Japan	16.7	35
4. Chinese Academy of Science (CAS), China	13.99	41
5. Osaka University, Japan	13.86	34

Articles & Letters	Reviews	All
Institution	Corrected Count ²	Articles ⁴
1. The University of Tokyo, Japan	5.42	6
2. The University of Melbourne, Australia	3.82	8
3. The University of Queensland, Australia	3.5	5
4. Agency for Science, Technology and Research (A*STAR), Singapore	2.46	4
5. The University of New South Wales, Australia	2.4	6

Articles & Letters	Reviews	All
Institution	Corrected Count ²	Articles ⁴
1. The University of Tokyo, Japan	39.09	88
2. RIKEN, Japan	20.43	52
3. Kyoto University, Japan	16.95	36
4. Osaka University, Japan	15.61	37
5. Chinese Academy of Science (CAS), China	14.32	43

EXPANDED AFFILIATIONS

Certain organizations, such as the Chinese Academy of Sciences and the Agency for Science, Technology and Research are umbrella agencies with many affiliated institutions. Such organizations are indicated by a plus mark ('+') in the index lists and can be expanded to show the contribution from each constituent institution.

Articles & Letters	Reviews	All
Institution	Corrected Count ²	Articles ⁴
1. The University of Tokyo, Japan	39.09	88
2. RIKEN, Japan	20.43	52
3. Kyoto University, Japan	16.95	36
4. Osaka University, Japan	15.61	37
5. Chinese Academy of Science (CAS), China	15.72	43
Institute of Physics (IOP), CAS	2.37	6
Shanghai Instituted for biological Sciences (SIBS), CAS	2.23	9
Institute of Biophysics (IBP), CAS	1.86	4

ARTICLES

The number of articles reflects the total number of articles with author affiliations for a particular institution or country. Institutions and countries are counted once per article. Clicking on the number of articles in any of the index ranking lists brings up a list of all of the articles published by an institution or country/territory in the past year. The articles contributing to the index are listed along with the name of the Nature journal and the corrected count associated with that article. Hovering over the article title reveals the article DOI and clicking on the title opens the article abstract on nature.com.

Articles & Letters	Reviews	All
Journal	Title	CC ²
<i>Nature Communications</i>	A-synuclein mutation linked to dementia produces neurodegeneration when expressed in mouse brain	0.03
<i>Nature Genetics</i>	A genome-wide association study identifies four susceptibility loci for keloid in the Japanese population	0.35

TOP 110 INSTITUTIONS

CHINA 2010

NATURE PUBLISHING INDEX 2010 CHINA — INSTITUTIONS

2010				2009		
RANK	INSTITUTION	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	13.354	40	1	12.008	31
2	Tsinghua University	6.155	16	2	2.696	8
3	University of Science and Technology of China	3.725	7	3	2.674	8
4	BGI Shenzhen	3.572	9	19	0.520	1
5	Peking University	3.440	17	4	2.615	8
6	Nanjing University	3.088	7	7	1.413	5
7	The University of Hong Kong	2.172	8	8	1.292	4
8	Southeast University	2.049	3	–	–	–
9	Xiamen University	1.829	3	10	1.000	1
10	Zhejiang University	1.650	12	14	0.664	4
11	Second Military Medical University	1.637	3	9	1.035	3
12	Fudan University	1.436	9	11	0.933	6
13	Anhui Medical University	1.367	3	6	1.421	3
14	Nankai University	1.243	4	38	0.141	1
15	Shanghai Cancer Institute	1.193	3	42	0.133	1
16	Nanjing Medical University	1.068	3	–	–	–
17	National Institute of Biological Sciences, Beijing	1.040	2	21	0.438	1
18	The Hong Kong Polytechnic University	1.000	1	26	0.250	1
19	GlaxoSmithKline Research and Development Center	0.940	1	–	–	–
20	Sun Yat-Sen University	0.894	7	57	0.060	1
21	Hong Kong University of Science and Technology	0.858	2	–	–	–
22	Xi'an Jiaotong University	0.801	2	–	–	–
23	China Agricultural University	0.723	5	36	0.146	2
24	The Chinese University of Hong Kong	0.712	5	12	0.883	3
25	Beijing Institute of Radiation Medicine	0.650	2	13	0.833	1
26	Shandong University	0.628	4	48	0.100	1
27	Chinese Academy of Agricultural Sciences	0.626	4	23	0.350	2
28	Zhengzhou University	0.573	3	–	–	–
29	Chinese Academy of Geological Sciences	0.500	2	26	0.250	1

2010				2009		
RANK	INSTITUTION	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
30	Beijing University of Technology	0.364	1	–	–	–
31	Beijing Normal University	0.350	2	61	0.031	1
32	Sichuan University	0.342	6	41	0.136	2
33	Shandong Tianyu Museum of Nature	0.333	1	26	0.250	1
34	China Earthquake Administration	0.324	2	18	0.530	1
35	Wuhan University	0.292	3	59	0.050	1
36	Soochow University	0.290	2	35	0.150	2
37	Shihezi University	0.258	2	39	0.140	1
38	Shanxi University	0.250	1	–	–	–
=	Beihang University	0.250	1	–	–	–
40	Chinese Academy of Medical Sciences & Peking Union Medical College	0.190	4	32	0.188	1
41	South China University of Technology	0.174	5	73	0.010	1
42	XinXiang Medical University	0.168	1	–	–	–
43	Dalian University of Technology	0.156	2	–	–	–
44	Earthquake Administration of Yunnan Province	0.154	1	–	–	–
45	Southwest University	0.152	1	–	–	–
46	Research Center for Qinghao	0.150	1	–	–	–
47	Beijing Institute of Microbiology and Epidemiology	0.146	1	–	–	–
48	Shantou University	0.131	2	–	–	–
49	Cancer Institute of Guangxi	0.130	1	–	–	–
=	Southern Medical University	0.130	1	–	–	–
51	Jilin University	0.125	2	22	0.373	4
52	National Center for Nanoscience and Technology	0.125	1	–	–	–
53	East China Normal University	0.108	2	37	0.143	1
54	Sichuan Normal University	0.100	1	–	–	–
55	Tongji University	0.090	2	34	0.161	2
56	Inner Mongolia Medical College	0.085	3	–	–	–
57	Shenzhen University	0.082	3	–	–	–

2010				2009		
RANK	INSTITUTION	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
58	Huazhong Normal University	0.080	1	–	–	–
59	Nanjing University of Information Science & Technology	0.070	1	–	–	–
60	Affymetrix Asia Pacific	0.060	1	–	–	–
=	Qidong Liver Cancer Institute	0.060	1	–	–	–
=	Liver Cancer Institute at Fusui County	0.060	1	–	–	–
63	The Third People's Hospital of Hangzhou	0.052	2	–	–	–
64	Shanghai JiaoTong University	0.052	2	5	1.760	10
65	Tianjin University	0.050	1	–	–	–
=	Renmin University of China	0.050	1	72	0.010	1
67	People's Hospital of Xinjiang Uygur Autonomous Region	0.042	2	67	0.015	1
68	China Medical University	0.040	1	30	0.202	2
=	Chinese National Human Genome Center at Shanghai	0.040	1	17	0.542	3
=	Lanzhou University	0.040	1	–	–	–
=	Guangzhou University of Chinese Medicine	0.040	1	–	–	–
72	Cixian Hospital	0.039	1	–	–	–
73	Huazhong Agricultural University	0.033	1	–	–	–
74	Fourth Military Medical University	0.030	1	–	–	–
=	Disease Prevention and Control Center at Haimen County	0.030	1	–	–	–
76	Yunnan University	0.028	1	–	–	–
77	China Conservation and Research Center for the Giant Panda	0.024	1	–	–	–
=	Chengdu Research Base of Giant Panda Breeding	0.024	1	–	–	–
79	Changzhi Medical College	0.023	1	–	–	–
80	Shandong Provincial Institute of Dermatology and Venereology	0.022	1	67	0.015	1
=	The General Hospital of Air Force	0.022	1	77	0.007	1
82	China Academy of Engineering Physics	0.021	1	–	–	–

2010				2009		
RANK	INSTITUTION	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
83	Nanjing Agricultural University	0.020	1	–	–	–
84	CapitalBio	0.020	1	–	–	–
85	Linzhou Esophageal Cancer Hospital	0.020	1	–	–	–
86	Capital Medical University	0.016	2	43	0.130	1
87	The First People's Hospital of Shangqiu	0.016	1	–	–	–
=	Anyang Tumor Hospital	0.016	1	–	–	–
=	Tumor Hospital of Linzhou	0.016	1	–	–	–
=	People's Hospital and Chinese Medicine Hospital of Linzhou	0.016	1	–	–	–
=	Xinjiang Medical University	0.016	1	–	–	–
=	Henan University of Science and Technology	0.016	1	–	–	–
93	Cancer Hospital of Henan Province	0.012	1	–	–	–
94	Guangxi Medical University	0.010	1	–	–	–
=	General Hospital of Beijing Military Command	0.010	1	–	–	–
=	Wannan Medical College	0.010	1	67	0.015	1
=	Shanghai Skin Diseases and STD Hospital	0.010	1	–	–	–
98	Ningxia Medical University	0.008	1	–	–	–
=	Xinyang Central Hospital	0.008	1	–	–	–
=	Central Hospital of Xinxiang	0.008	1	–	–	–
=	Nanyang Medical College	0.008	1	–	–	–
=	Henan University	0.008	1	–	–	–
=	People's Hospital of Puyang	0.008	1	–	–	–
=	Fujian Medical University	0.008	1	–	–	–
=	Henan Provincial People's Hospital	0.008	1	–	–	–
=	The Third People's Hospital of Yunnan Province	0.008	1	–	–	–
=	Hebi Dahejian Hospital	0.008	1	–	–	–
=	Shaanxi Tumor Hospital	0.008	1	–	–	–
=	The Red Cross Hospital of Huojia	0.008	1	–	–	–
110	Hefei Teachers College	0.005	1	–	–	–

TOP INSTITUTIONS BY NATURE JOURNAL

CHINA 2009–2010

Nature, which celebrated its 142nd anniversary in 2010, is the mother of a growing family of journals of the Nature Publishing Group (NPG). With the addition in 2010 of *Nature Communications* — the first multidisciplinary journal launched by NPG since *Nature* itself — there are now 17 primary research journals included in the Nature Publishing

Index. *Nature* is published on a weekly basis, the Nature research journals are published monthly on a wide range of topics covering the life, physical and chemical sciences. The top five Chinese institutions publishing in the Nature research titles over the past two years (2009–2010) are presented below along with the top ten for *Nature*. ■

NATURE



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	9.06	38
2	Tsinghua University	3.70	7
3	Peking University	2.45	9
4	The University of Hong Kong	1.72	6
5	University of Science and Technology of China	1.67	3
6	BGI Shenzhen	0.95	4
7	Xiamen University	0.81	1
8	Shanghai Jiao Tong University	0.69	7
9	National Institute of Biological Sciences, Beijing	0.65	1
10	Shenyang Normal University	0.63	1

NATURE CHEMICAL BIOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Shandong University	0.12	1
2	Nankai University	0.03	1

NATURE CHEMISTRY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Nankai University	1.00	1
=	Fudan University	1.00	1
=	Xiamen University	1.00	1
4	Peking University	0.90	1
5	Chinese Academy of Sciences	0.83	1

NATURE BIOTECHNOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	BGI Shenzhen	1.01	2
2	The University of Hong Kong	0.94	1
3	Shanghai Cancer Institute	0.26	1
4	Chinese Academy of Sciences	0.20	3
5	Southwest University	0.15	1

NATURE COMMUNICATIONS



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Southeast University	2.00	2
2	Chinese Academy of Sciences	1.90	5
3	University of Science and Technology of China	1.00	1
4	Nanjing University	0.84	2
5	Beijing University of Technology	0.36	1

NATURE CELL BIOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	1.61	7
2	Shanghai Jiao Tong University	1.00	1
=	Xiamen University	1.00	1
4	Peking University	0.99	2
5	Tsinghua University	0.96	4

NATURE GENETICS



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Anhui Medical University	2.79	6
2	Chinese Academy of Sciences	2.28	11
3	BGI Shenzhen	2.13	4
4	Chinese Academy of Agricultural Sciences	0.95	5
5	Sun Yat-Sen University	0.66	3

NATURE GEOSCIENCE



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	China Earthquake Administration	0.85	3
=	Chinese Academy of Sciences	0.85	3
3	Chinese Academy of Geological Sciences	0.17	1
4	Earthquake Administration of Yunnan Province	0.15	1
5	University of Science and Technology of China	0.14	1

NATURE IMMUNOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Second Military Medical University	2.61	3
2	Tsinghua University	1.00	1
=	Peking University	1.00	1
4	Chinese Academy of Sciences	0.73	2
5	Shanghai Medical College	0.33	1

NATURE MATERIALS



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Nanjing University	1.27	3
2	The Hong Kong Polytechnic University	1.00	1
3	University of Science and Technology of China	0.33	2
4	Chinese Academy of Sciences	0.20	1
5	Harbin Institute of Technology	0.13	1

NATURE MEDICINE



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Nanjing Medical University	1.00	1
2	GlaxoSmithKline Research and Development Center	0.94	1
3	Chinese Academy of Sciences	0.18	2
4	East China Normal University	0.14	1
=	Shihezi University	0.14	1

NATURE NANOTECHNOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Nanjing University	1.25	2
2	Fudan University	0.64	1
3	Zhejiang University	0.56	2
4	The Chinese University of Hong Kong	0.50	1
5	Shandong University	0.44	1

NATURE NEUROSCIENCE



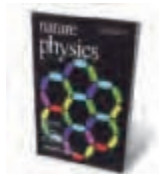
RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	2.28	4
2	Sichuan University	0.42	2
3	The University of Hong Kong	0.27	1
4	Huazhong University of Science and Technology	0.25	1
=	The Hong Kong Polytechnic University	0.25	1

NATURE PHOTONICS



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	University of Science and Technology of China	1.81	3
2	Nanjing University	0.50	1
3	Tsinghua University	0.47	1

NATURE PHYSICS



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	2.82	10
2	University of Science and Technology of China	1.41	4
3	Tsinghua University	1.08	4
4	Peking University	0.21	1
5	The University of Hong Kong	0.13	1

NATURE STRUCTURAL & MOLECULAR BIOLOGY



RANK	INSTITUTION	CORRECTED COUNT	ARTICLES
1	Chinese Academy of Sciences	2.33	5

There is no paper published in *Nature Methods* from China during 2009 to 2010.

ASIA-PACIFIC TOP 200 INSTITUTIONS

2010

NATURE PUBLISHING INDEX 2010 ASIA-PACIFIC — INSTITUTIONS

2010					2009		
RANK	INSTITUTION	COUNTRY	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
1	The University of Tokyo	Japan	34.33	80	1	28.43	68
2	RIKEN	Japan	18.24	50	4	12.56	42
3	Kyoto University	Japan	16.98	36	2	18.14	41
4	Chinese Academy of Sciences	China	13.35	40	5	12.01	31
5	Osaka University	Japan	13.27	34	3	15.68	34
6	Tohoku University	Japan	8.04	22	6	7.08	23
7	Tsinghua University	China	6.16	16	17	2.70	8
8	Nagoya University	Japan	5.44	14	16	3.01	10
9	Agency for Science, Technology and Research	Singapore	5.00	22	8	5.56	17
10	Seoul National University	Korea	4.87	18	7	5.95	13
11	Korea Advanced Institute of Science & Technology	Korea	4.59	10	22	2.43	4
12	National Institute of Advanced Industrial Science and Technology	Japan	4.53	18	30	1.69	8
13	The University of Sydney	Australia	4.15	18	15	3.13	9
14	The University of Queensland	Australia	3.90	15	10	4.30	17
15	National University of Singapore	Singapore	3.73	22	21	2.46	9
16	University of Science and Technology of China	China	3.73	7	18	2.67	8
17	BGI	China	3.57	9	100	0.52	1
18	Peking University	China	3.44	17	19	2.62	8
19	Monash University	Australia	3.25	10	25	2.21	9
20	Nanjing University	China	3.09	7	34	1.41	5
21	The Commonwealth Scientific and Industrial Research Organisation	Australia	2.98	12	48	1.12	6
22	Hokkaido University	Japan	2.85	6	71	0.80	4
23	Sungkyunkwan University	Korea	2.82	6	61	0.93	4
24	The University of New South Wales	Australia	2.74	13	51	1.08	5
25	The University of Melbourne	Australia	2.61	17	11	3.78	21
26	Kanazawa University	Japan	2.44	3	144	0.27	3
27	Kyushu University	Japan	2.36	10	12	3.60	12
28	Japan Agency for Marine-Earth Science and Technology	Japan	2.26	5	187	0.17	2
29	Keio University	Japan	2.23	6	14	3.31	10
30	Griffith University	Australia	2.20	6	180	0.18	5
31	The University of Hong Kong	China	2.17	8	37	1.29	4
32	Australian National University	Australia	2.14	9	9	4.65	15
33	National Institute for Material Science	Japan	2.08	7	24	2.31	5
34	Southeast University	China	2.05	3	–	–	–
35	Tokyo Institute of Technology	Japan	2.04	9	32	1.50	11
36	Hiroshima University	Japan	1.99	6	42	1.22	9
37	Tokyo Medical and Dental University	Japan	1.86	6	23	2.32	12
38	Xiamen University	China	1.83	3	56	1.00	1
39	Pohang University of Science and Technology	Korea	1.82	6	27	2.01	8
40	Nara Institute of Science and Technology	Japan	1.76	6	248	0.10	1
41	The University of Otago	New Zealand	1.75	8	90	0.57	6
42	University of Tsukuba	Japan	1.70	4	31	1.56	7
43	The Walter and Eliza Hall Institute of Medical Research	Australia	1.65	7	13	3.33	9
44	Zhejiang University	China	1.65	12	82	0.66	4

2010					2009		
RANK	INSTITUTION	COUNTRY	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
45	Nanyang Technological University	Singapore	1.65	5	35	1.40	5
46	Second Military Medical University	China	1.64	3	53	1.03	3
47	Korea University	Korea	1.58	5	26	2.15	8
48	Macquarie University	Australia	1.52	4	125	0.35	3
49	NTT Group	Japan	1.50	2	–	–	–
50	Fudan University	China	1.44	9	60	0.93	6
51	Victor Chang Cardiac Research Institute	Australia	1.43	3	339	0.04	1
52	Anhui Medical University	China	1.37	3	33	1.42	3
53	National Institute of Information and Communications Technology	Japan	1.29	3	–	–	–
54	Antarctic Climate and Ecosystems Cooperative Research Centre	Australia	1.29	2	–	–	–
55	GNS Science	New Zealand	1.28	4	52	1.06	3
56	Nankai University	China	1.24	4	205	0.14	1
57	Japan Synchrotron Radiation Research Institute	Japan	1.24	8	225	0.13	1
58	Shanghai Cancer Institute	China	1.19	3	216	0.13	1
59	Okayama University	Japan	1.12	3	156	0.24	2
60	Nanjing Medical University	China	1.07	3	–	–	–
61	National Institute of Biological Sciences, Beijing	China	1.04	2	114	0.44	1
62	Okinawa Institute of Science and Technology	Japan	1.04	3	–	–	–
63	Garvan Institute	Australia	1.04	4	65	0.87	4
64	Kobe Pharmaceutical University	Japan	1.00	1	–	–	–
65	Chugai Pharmaceutical	Japan	1.00	1	–	–	–
66	National Research Institute for Earth Science and Disaster Prevention	Japan	1.00	1	–	–	–
67	The Hong Kong Polytechnic University	China	1.00	1	153	0.25	1
68	GlaxoSmithKline Research and Development Center	China	0.94	1	–	–	–
69	Kobe University	Japan	0.92	7	44	1.18	7
70	Sun Yat-Sen University	China	0.89	7	301	0.06	1
71	Hong Kong University of Science and Technology	China	0.86	2	–	–	–
72	Hanyang University	Korea	0.85	2	83	0.66	2
73	National Institute of Agrobiological Sciences	Japan	0.85	3	–	–	–
74	The Jikei University	Japan	0.84	3	55	1.00	1
75	Waseda University	Japan	0.83	4	120	0.39	2
76	Queensland Institute of Medical Research	Australia	0.83	16	28	1.76	11
77	The University of Tasmania	Australia	0.81	4	–	–	–
78	The University of Auckland	New Zealand	0.81	6	124	0.37	3
79	Xi'an Jiaotong University	China	0.80	2	–	–	–
80	National Institute of Informatics	Japan	0.80	2	–	–	–
81	Korea Research Institute of Bioscience and Biotechnology	Korea	0.79	3	113	0.44	1
82	The University of Adelaide	Australia	0.76	6	260	0.08	3
83	Massey University	New Zealand	0.75	1	62	0.90	1
84	International Centre for Diarrhoeal Disease Research	Bangladesh	0.75	1	–	–	–
85	Korea Institute of Science and Technology	Korea	0.74	4	46	1.15	2
86	China Agricultural University	China	0.72	5	201	0.15	2
87	The Chinese University of Hong Kong	China	0.71	5	64	0.88	3
88	Yokohama City University	Japan	0.69	4	74	0.76	5
89	Fujita Health University	Japan	0.66	2	155	0.24	3
90	Gwangju Institute of Science and Technology	Korea	0.66	2	49	1.08	3
91	Beijing Institute of Radiation Medicine	China	0.65	2	70	0.83	1
92	Tokyo Metropolitan Institute for Neuroscience	Japan	0.63	1	109	0.50	1
93	Daiichi Sankyo	Japan	0.63	1	–	–	–
94	Novartis	Singapore	0.63	1	–	–	–
95	Shandong University	China	0.63	4	246	0.10	1
96	Chinese Academy of Agricultural Sciences	China	0.63	4	126	0.35	2

2010					2009		
RANK	INSTITUTION	COUNTRY	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
97	Victoria University of Wellington	New Zealand	0.62	4	231	0.12	1
98	Korea Research Institute of Chemical Technology	Korea	0.61	2	–	–	–
99	Juntendo University	Japan	0.61	4	73	0.77	5
100	Zhengzhou University	China	0.57	3	–	–	–
101	National Yang-Ming University	Taiwan	0.56	2	242	0.10	1
102	Yonsei University	Korea	0.56	6	40	1.27	3
103	Ewha Womans University	Korea	0.55	3	41	1.24	2
104	Japan Atomic Energy Agency	Japan	0.55	2	241	0.10	1
105	Akita University	Japan	0.54	1	117	0.42	1
106	National Cardiovascular Center Research Institute	Japan	0.53	2	–	–	–
107	Sogang University	Korea	0.52	2	87	0.59	3
108	University of Hyogo	Japan	0.52	3	136	0.32	2
109	The University of Wollongong	Australia	0.50	2	226	0.13	1
110	Nihon University	Japan	0.50	1	129	0.34	2
111	Chinese Academy of Geological Sciences	China	0.50	2	147	0.25	1
112	Ajou University	Korea	0.48	3	355	0.03	1
113	The University of Western Australia	Australia	0.48	15	36	1.40	10
114	Gunma University	Japan	0.47	4	318	0.05	2
115	Nagasaki University	Japan	0.47	3	–	–	–
116	Cooperative Research Centre for National Plant Biosecurity	Australia	0.47	1	–	–	–
117	Taipei Veterans General Hospital	Taiwan	0.45	1	–	–	–
118	National Institute of Genetics	Japan	0.45	3	78	0.71	2
119	Ono Pharmaceutical	Japan	0.44	1	–	–	–
120	ROHM	Japan	0.44	2	–	–	–
121	National Center for Neurology and Psychiatry	Japan	0.43	3	–	–	–
122	Nippon Oil Corporation	Japan	0.43	1	–	–	–
123	National Institutes of Natural Sciences	Japan	0.42	2	–	–	–
124	Ideal Star	Japan	0.42	1	–	–	–
125	National Cancer Center	Japan	0.42	1	68	0.85	3
126	University of Science and Technology	Korea	0.42	3	291	0.06	1
127	Doshisha University	Japan	0.41	2	–	–	–
128	Landcare Research	New Zealand	0.40	1	240	0.10	1
129	Chuo University	Japan	0.40	1	–	–	–
130	Japan Fine Ceramics Center	Japan	0.40	2	206	0.14	1
131	Peter MacCallum Cancer Center	Australia	0.40	6	72	0.78	8
132	China Medical University	Taiwan	0.39	3	345	0.03	2
133	Tata Institute of Fundamental Research	India	0.38	2	58	1.00	1
134	Tokyo University of Agriculture and Technology	Japan	0.37	2	–	–	–
135	Kyowa Hakko Kirin	Japan	0.37	3	145	0.25	1
136	Beijing University of Technology	China	0.36	1	–	–	–
137	Indian Institute of Technology Kanpur	India	0.36	1	–	–	–
138	Unhwa Corporation	Korea	0.36	1	–	–	–
139	Tokyo Metropolitan Institute of Medical Science	Japan	0.36	2	84	0.64	5
140	Swinburne University of Technology	Australia	0.35	2	57	1.00	1
141	Korea Ocean Research & Development Institute	Korea	0.35	1	133	0.33	1
142	Beijing Normal University	China	0.35	2	349	0.03	1
143	Sichuan University	China	0.34	6	215	0.14	2
144	Sapporo Salmon Museum	Japan	0.33	1	–	–	–
145	Shandong Tianyu Museum of Nature	China	0.33	1	148	0.25	1
146	Tokyo Women's Medical University	Japan	0.32	3	99	0.52	3
147	China Earthquake Administration	China	0.32	2	98	0.53	1
148	FDK Corporation	Japan	0.32	2	–	–	–

2010					2009		
RANK	INSTITUTION	COUNTRY	CORRECTED COUNT	ARTICLES	RANK	CORRECTED COUNT	ARTICLES
149	Institute of Society for Techno-Innovation of Agriculture, Forestry and Fisheries	Japan	0.32	2	–	–	–
150	Osaka Prefecture University	Japan	0.31	3	191	0.17	1
151	Chang Gung University	Taiwan	0.31	2	286	0.07	2
152	National Cancer Center	Korea	0.29	1	68	0.85	3
153	Wuhan University	China	0.29	3	312	0.05	1
154	Soochow University	China	0.29	2	200	0.15	2
155	Osaka City University	Japan	0.29	1	45	1.18	5
156	Geological Survey Institute	Indonesia	0.29	1	–	–	–
157	Hitachi	Japan	0.29	2	316	0.05	2
158	Ishikawa Prefectural University	Japan	0.29	1	–	–	–
159	Chiba University	Japan	0.28	3	43	1.19	3
160	Kumamoto University	Japan	0.28	2	141	0.28	3
161	Japan Aerospace Exploration Agency	Japan	0.27	2	168	0.21	3
162	National Institute for Environmental Studies	Japan	0.27	1	–	–	–
163	Toranomon Hospital	Japan	0.27	1	303	0.06	1
164	Mahidol University	Thailand	0.26	4	177	0.19	2
165	Iwate Medical University	Japan	0.26	2	–	–	–
166	Shihezi University	China	0.26	2	212	0.14	1
167	Shanxi University	China	0.25	1	–	–	–
168	Beihang University	China	0.25	1	–	–	–
169	Ritsumeikan University	Japan	0.25	1	–	–	–
170	Kochi Medical School	Japan	0.25	1	–	–	–
171	National Institute for Basic Biology	Japan	0.24	2	–	–	–
172	Academia Sinica	Taiwan	0.24	2	50	1.08	3
173	Konkuk University	Korea	0.24	3	236	0.11	1
174	Samsung	Korea	0.23	2	20	2.48	5
175	Osaka Kyoiku University	Japan	0.23	2	–	–	–
176	Ludwig Institute for Cancer Research	Australia	0.23	1	193	0.17	1
177	Tokyo University of Agriculture	Japan	0.22	1	–	–	–
178	Central Research Institute of Electric Power Industry	Japan	0.22	2	–	–	–
179	The Royal Children's Hospital	Australia	0.22	1	–	–	–
180	Hirosaki University	Japan	0.22	2	–	–	–
181	Westmead Millennium Institute	Australia	0.22	1	230	0.12	2
182	Gifu University	Japan	0.22	1	–	–	–
183	Australian Astronomical Observatory	Australia	0.22	1	–	–	–
184	Hyogo College of Medicine	Japan	0.22	2	39	1.27	4
185	Shinshu University	Japan	0.22	2	97	0.53	2
186	Sapporo Medical University	Japan	0.20	2	169	0.21	2
187	Saitama Medical University	Japan	0.20	3	232	0.11	3
188	Azabu University	Japan	0.20	1	–	–	–
189	Nagoya Institute of Technology	Japan	0.20	1	–	–	–
190	Toyama Prefectural Agricultural, Forestry & Fisheries Research Center	Japan	0.20	1	–	–	–
191	NIWA	New Zealand	0.20	1	–	–	–
192	Ushio	Japan	0.20	1	–	–	–
193	University of Tokushima	Japan	0.19	2	143	0.27	3
194	Chinese Academy of Medical Sciences & Peking Union Medical College	China	0.19	4	178	0.19	1
195	National Tsing Hua University	Taiwan	0.18	2	–	–	–
196	National Institute for Longevity Sciences	Japan	0.18	2	–	–	–
197	KAN Research Institute	Japan	0.18	1	235	0.11	1
198	Burnet Institute	Australia	0.18	1	254	0.09	1
199	The University of Aizu	Japan	0.18	1	–	–	–
200	South China University of Technology	China	0.17	5	405	0.01	1



GlaxoSmithKline R&D China

A LEADER IN NEUROSCIENCE DRUG DISCOVERY AND DEVELOPMENT

GlaxoSmithKline (GSK), a leader in the global pharmaceutical industry, strives to improve the quality of human life by enabling people to do more, feel better and live longer. Our company has a firm foundation in science and an excellent track record of turning innovative research into new medicines. GSK is headquartered in the UK, where it has a number of research complexes, along with research centers in the US, and in Belgium, where its vaccines research is based.

In 2007, GSK committed to establishing an R&D hub in Shanghai, China, primarily for neurodegeneration and neuroinflammation research. The emphasis is on carrying work from early phase drug discovery through to clinical proof-of-concept studies for diseases such as Alzheimer's disease (AD), Parkinson's disease (PD), and multiple sclerosis (MS).

A desire to capitalize on the spirit and energy of the local workforce drove the decision to begin R&D in China, particularly as a growing number of experienced scientists were returning to their homeland from the US and Europe. Our objective is to make "discovered in China" a reality. The culture of GSK in China is very much that of an entrepreneurial biotech organization in a "big pharma" setting, complete with support and long-term vision.

Since 2008, GSK has recruited nearly 450

people into the Shanghai research operations. Already, these employees have demonstrated significant capabilities in drug discovery: three clinical trials in MS and AD have started, two drug candidates have advanced to clinical studies, and in February 2010, some of our early stage work with elucidation of a possible role for IL-7 in MS was published in *Nature Medicine*.

Neurological disorders present some very significant challenges for drug discovery, primarily due to the complexity of the brain and a lack of in-depth understanding of disease biology. This situation is compounded by a lack of animal models which accurately mimic human disease, and limited access to drug targets in the central nervous system owing to the blood-brain barrier (BBB). At GSK R&D China we view these challenges as opportunities to apply cutting edge science to generate novel and innovative solutions. And we favor targets that address multiple pathways relevant to disease biology since we believe that this will enhance success in achieving clinical efficacy.

To address the deficiencies in animal models for profiling drug candidates, we have established stem-cell platforms, which can also be used for phenotypic screening to identify novel, disease relevant targets. GSK is also engaged in initiatives

both internally and through collaboration, which are designed to circumvent the problems involved in penetrating the BBB.

A diverse compound screening collection, for example, plays an important part in the identification of tractable starting points for drug discovery. In China, we have used knowledge about traditional Chinese medicines to assemble a collection of pure molecules from medicinally important plants for screening.

Clinical trials for many CNS disorders, such as PD and AD, require lengthy studies but a lack of genuine biomarkers and good clinical readouts make proof-of-concept studies difficult. As such, GSK is devising experimental medicine studies that can provide the confidence to make the substantial investment decisions needed to progress molecules to late stage clinical evaluation.

GSK believes that the discovery of truly differentiated medicines requires the application of game-changing science. In Shanghai we are fully committed to this course.



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INTRODUCING *NATURE CHINA*

A ONE-STOP PORTAL HIGHLIGHTING THE BEST SCIENTIFIC RESEARCH FROM MAINLAND CHINA AND HONG KONG

www.naturechina.com

Nature China highlights the best research coming out of Mainland China and Hong Kong, providing scientists from around the world with a convenient portal into publications drawn from across all scientific disciplines. Each month, our editors scan the recently published literature, select high-quality papers and write 200-word summaries to explain the significance of the research work.

The official website naturechina.com, intended for users based outside of Mainland China, was launched in January 2007. The mirror website naturechina.com.cn, intended for users based within Mainland China, was launched in April 2007.

In celebration of *Nature China*'s four-year anniversary, in May 2011,

we have relaunched the website with a new design and expanded content. The website now includes highlights from Chinese academic journals that are in partnership with Nature Publishing Group, such as *Acta Pharmacologica Sinica*, *Asian Journal of Andrology*, and *Cell Research*; top-ten most read *Nature China* highlights of each year; and monthly updated rankings of Chinese academic institutions according to their output of papers in Nature primary research journals.

By organizing all these information into a comprehensive, regularly updated, one-stop web portal, we hope to help you quickly reach the resources you need to study, and to keep you up-to-date with the most significant research coming out of Mainland China and Hong Kong. ■

NATURE CHINA CONTENTS



LATEST RESEARCH HIGHLIGHTS

Nature China is dedicated to highlighting the best research being produced in Hong Kong and Mainland China in science and clinical medicine.

Every week our editors survey the scientific literature to identify the best recently published papers, from the region, and provide short summaries.

NPG PUBLISHING PARTNER HIGHLIGHTS

Each month our editors choose a selection of highlights from the NPG partner journals based in China.

NATURE PUBLISHING INDEX CHINA

Institutions in China are ranked each month on the numbers of papers they have published in Nature journals in the past 12 months and adjusted for the relative contributions of authors from the institution to the paper.

TOP TEN HIGHLIGHTS

A list of the top ten most downloaded highlights from the international website of *Nature China* of that year, taking into account the time at which they were published.



THE UNIVERSITY OF HONG KONG

A CENTURY OF KNOWLEDGE, HERITAGE AND SERVICE: LOOKING AHEAD TO THE NEXT 100 YEARS

The University of Hong Kong (HKU) was founded in 1911 by a group of visionaries to nurture future generations of leaders and promote a knowledge-based society. For the past 100 years, HKU has lived up to its promise, growing with and helping to shape the city as Hong Kong redefines its position on the international landscape of education and research.

Today HKU has become a comprehensive research-intensive institution comprising ten faculties. HKU has cast its net wide and attracted funding, talents and international collaboration, enabling the university to produce numerous important discoveries. HKU has far-reaching influence that goes beyond Greater China and the Asia-Pacific region.

International excellence, regional prominence

HKU consistently ranks high among the top universities in the world. In 2010, the Times Higher Education and the Quacquarelli Symonds World University Rankings named HKU as the number one university in Asia, and 21st and 23rd in the world. Moreover, according to ISI Essential Science Indicators, HKU has 110 scientists who rank among the top one per cent in their field. The international

recognition has enabled the university to attract high-calibre researchers, teachers and students — not only from Hong Kong, but also mainland China and around the world — and create a dynamic environment that reels in talents and ideas. HKU has invited a list of visiting research professors, including outstanding scientists from Princeton University, the University of Toronto and Yale University; established joint doctorate programmes with institutions, including Imperial College and King's College, London; and actively participated in networks, such as Universitas 21, the Association of Pacific Rim Universities and the Association of Commonwealth Universities.

HKU is situated in Hong Kong, a city hub that conveniently links international researchers with mainland Chinese partners for collaboration. Four 'state key laboratories' — a key component of China's research in science and technology — on brain and cognitive sciences, emerging infectious diseases, liver research and synthetic chemistry are currently based at HKU. The university has recently established a research and development base in Shenzhen to foster a closer tie with the government, industry, and education and research communities of mainland China.

HKU is currently exploring opportunities for further research collaborations and centres in mainland China.

Locally, the university repeatedly secures a major share of competitive government funding for research, including taking the lead in recently funded, cross-institutional projects on nasopharyngeal carcinoma research, molecular functional materials, and emerging electronics. HKU has the largest number of academicians of the Chinese Academy of Sciences/Engineering of any Hong Kong institution and holds a leading position in research output, both in the quantity of output and the number of citations.

HKU aims to apply the innovative findings of its research to enhance development and change lives, actively encouraging technology transfer and knowledge exchange.

Strategic areas of research focus

HKU supports a broad range of curiosity-driven research and encourages novel inter-disciplinary research through its Strategic Research Areas programme. In 2008 to 2011, HKU has identified five areas of strengths encompassing 19 themes to encourage cross-fertilization of knowledge, expertise and ideas.



Biomedicine: Stem cells and genetics are at the cutting edge of research in finding causes of illness and cures. Researchers at HKU are now studying the role of cancer stem cells in the development of liver and colorectal cancer, identifying genetic factors that might increase the risk of scoliosis and schizophrenia, and developing molecular therapies for degenerative disc disease. Another cause of disease is infection and HKU is at the forefront in investigating the sources and treatment of emerging viruses, such as SARS, bird flu and swine flu.

Frontier technology: HKU researchers are developing new technologies to amass a comprehensive list of genomic and proteomic changes associated with diseases and improve distributed computer systems. Nanotechnology could help engineer body tissues for growth and repair, and produce novel medicines and implants. New technologies are also being used to investigate compounds, particularly those related to traditional Chinese medicine, which might lead to new drug discoveries.

Environment: HKU researchers are exploring new ways of producing, storing, using, and integrating renewable energy sources; designing and synthesizing

molecular materials that can offer, for example, lower power consumption and innovative applications; and investigating ways to make cities and water supplies sustainable in the face of urbanization, industrial development, and population growth.

China: Rapid developments in China often outpace government policy and can result in collisions between old and new ways of doing things. HKU researchers are considering how these changes affect business, governance and social welfare, and examining the effectiveness of government policy in addressing urban policy. The impact of a changing society on the creative industries is another area of focus, as is the effects of mobility on the sense of identity.

Community: Hong Kong faces challenges and opportunities both unique to its situation and shared with other world cities. HKU researchers are addressing issues such as childhood obesity and the effect of physical environment on physical activity; how to incorporate technologies into new scientifically based, knowledge-building models for teaching and learning; and the structures that underpin Hong Kong's governance, including financial regulatory systems.

Severe Acute Respiratory Syndrome (SARS)

HKU has played an indispensable role in the global battle against SARS. One of the most noteworthy achievements happened in March 2003 when the Li Ka Shing Faculty of Medicine discovered the coronavirus for causing SARS. A rapid response to the crisis was possible thanks to HKU's established expertise in microbiology, infectious diseases, pathology and immunology, as well as previous work in avian flu. HKU has gained leverage on the proximity to and collaborations with South China, a primary breeding ground for emerging infections.

Besides identifying the coronavirus, developing rapid diagnostic tests and finding the animal reservoir and possible portals of transmission for SARS, the microbiology team at HKU has also collaborated with the hospital authority to engage in clinical and virological studies on the impact of viral load, radiographic features, antiviral treatment and epidemiology of this new type of pneumonia.



THE UNIVERSITY OF HONG KONG
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www.hku.hk



XIAMEN UNIVERSITY

BUILDING A HIGH-LEVEL RESEARCH UNIVERSITY THAT IS WELL-KNOWN THROUGHOUT THE WORLD

Xiamen University (XMU) was founded in 1921 by the patriotic overseas Chinese leader Tan Kah Kee. It was designated a state key university in 1963 and is now one of China's top-level universities listed under the state key '211' and '985' construction projects.

XMU is located on the southeastern coast of Xiamen Island. Backed by the hills and facing the sea, many visitors enjoy the delightful climate and beautiful scenery offered at the XMU campus. XMU provides its academic staff with first-class facilities, including libraries, campus network and fully equipped laboratories, which have attracted a large number of outstanding scientists from home and abroad.

XMU has placed equal importance to the development of both natural and social sciences. Currently, XMU has five first-class and nine second-class national key disciplines. The first-class disciplines are theoretical economics, applied economics, chemistry, oceanography, and business management, while the second-class disciplines are international law, higher education studies, specialized history, pure mathematics, condensed matter physics, zoology, marine biology, cell biology and environmental sciences.

Chemistry is one of the key research

strengths of XMU, and the College of Chemistry and Chemical Engineering is known for its excellence in physical chemistry, including catalysis, electrochemistry, theoretical chemistry and structural chemistry. The college is also the home to the State Key Laboratory of Physical Chemistry of Solid Surfaces, the National Engineering Laboratory for Green Chemical Production of Alcohols, Ethers and Esters and several other provincial key laboratories. There are designated teams for studying physical chemistry on nanomaterials, cluster chemistry and interfacial electrochemistry under the National Natural Scientific Foundation program, as well as teams for studying theoretical chemistry under the administration of the Ministry of Education. Their research spans a wide range of topics, including the surface chemistry of nanostructures, the physical chemistry of nanomaterials, the synthesis of special clusters (e.g. fullerenes, metal clusters and coordination polymers), electrochemical reactions, as well as valence-bond theory. In the last three years, they have published six papers in *Nature* and *Nature* research journals. Chemical biology and chemical engineering are two additional disciplines that have emerged recently;

there are designated teams for studying pharmaceutical chemistry, structural biology, nanobiology, biological engineering and catalysis.

The School of Life Sciences has made great advances over the last few years in both research and teaching. Most notably, the School has recruited a good number of new faculty members who have extensive research experience in advanced countries. The main areas of research covered include biochemistry, molecular biology, cell biology, immunology, and mechanistic studies on various signaling pathways that are closely related to cell growth and metabolic controls. Some of their results have been published in top journals including *Science*, *Nature Immunology*, *Nature Cell Biology*, *Nature Chemical Biology*, and *Developmental Cell*. In particular, the school has recently been awarded a State Key Laboratory for Stress Cell Biology. They also have a division working on plant genetics. In addition, there is a key Laboratory of the Ministry of Education for Coastal and Wetland Ecosystems. Parasitology has been a traditional strength of research in this school.

The College of Oceanography and Environmental Science is home to the State Key Laboratory of Marine



Environmental Science and several key laboratories at provincial and ministerial levels. Its research focuses on marine biogeochemical processes and their interaction with ecosystem. The college hosts a number of state key research projects, including the '973' and '863' projects, as well as several National Natural Science Foundation projects. It has conducted excellent research in areas, including ocean carbon cycle, marine microbial ecology, ocean acidification, ecotoxicology, marine biology and marine environmental monitoring. It is also a clear leader in the fields of underwater acoustic communication and marine information technology. And its recent conceptual framework on the 'Microbial Carbon Pump' has received international recognition as the SCOR 134 Working Group.

Given the major needs of China and the ever-greater needs of humankind, XMU concentrates on the development of cutting-edge science and attaches great importance to interdisciplinary research. Energy research is a field that requires the background knowledge of a number of fields including chemistry, physics and materials science. It spans areas covering advanced nuclear energy, chemical energy, biochemistry, solar energy, materials engineering and energy economics. The School of Energy Research is becoming a leader in China for the development and industrialization of new energy technologies, providing indispensable support for the development of sustainable energy for China.

Traditional disciplines like physics and mathematics have undergone much changes in recent years; newly emerged disciplines, such as information science, medicine, public health and pharmacology, have advanced rapidly. Disciplines in the social sciences and humanities, including economics, business management and forensic studies, have developed at similar speed, while Southeast Asian studies, Taiwan studies, higher education studies, economics and accounting have become top research areas for China.

Industrialisation and development

XMU plays an important role in industrialisation and development. The National Science and Technology Park of the University, built in 1995, is responsible for putting scientific discoveries into practical applications. XMU actively participates in collaboration with other universities and enterprises in China. For example, it has launched joint research projects with governments of Xinjiang, Shenzhen and Xiamen, as well as with large enterprises, including the Aviation Industry Corporation of China, Datang International Power Generation Corporation, the Bank of China, the Technology Software and Integrated Circuit Promotion Centre and the State Nuclear Power Technology Corporation. XMU has implemented a number of results in the areas of new energies, new materials, biomedicine, public health, information technology, and electronics into industrial applications. Examples

include the world's first physical method for producing polysilicon solar cells, the first vaccine against Hepatitis E, and a rapid diagnostic kit for H5N1 avian influenza.

International Cooperation

Xiamen University currently cooperates with 32 of the global top 200 universities and 14 of the global top 100 universities. The university was a founder member of the G8 consortium of universities for multilateral educational cooperation in 2004. It has been included under the European programme 'Erasmus Mundus External Cooperation Window'. In addition, it is a member of a number of international university associations, including the Global Engineering Education Exchange, the ASEAN University Network and the Association of Universities in the Circum-Huanghai Region.

Future development

By adhering to its motto "pursue excellence, strive for perfection", XMU is now progressing towards its goal of "building a high-level research university well-known both at home and abroad". In this era of globalisation, XMU will go out to the world with an open mind, tolerance, solid foundations and influential research achievements.



Xiamen University
www.xmu.edu.cn/english



ANHUI MEDICAL UNIVERSITY

STRIVING FOR EXCELLENCE IN HEALTH CARE THROUGH TRANSLATIONAL MEDICAL RESEARCH

An overview

Founded in 1926, Anhui Medical University (AMU) is a comprehensive medical institution with over 16,600 students and 3,700 faculty and staff members. AMU, together with more than 47 teaching hospitals across China, is now one of the leading and largest institutions of medicine for high-level medical research and education in the country. In 2010, AMU came 13th in the China rankings and 52nd in the Asia-Pacific rankings of the Nature Publishing Index.

AMU has been striving for excellence in health care by pursuing interdisciplinary research and integrating its teaching and research with clinical care and international collaboration. In recent years, AMU has gradually extended its spectrum of teaching and research. It now covers almost all the medical fields, including clinical medicine, public health, preventive medicine, health management, dermatology, pharmacology, epidemiology, immunology, neurology, psychology, dentistry, nursing, paediatrics and geriatrics.

Dermatology

The rich human and natural resources of Anhui Province have provided AMU the advantage to pursue translational

research. AMU has devoted its resources on the genetic study of complex diseases, including skin diseases, leukaemia, liver cancer, polycystic ovary syndrome, premature ovary failure and urinary tract disorders. The aim is to identify susceptibility genes, as well as other genetic and environmental factors, that might increase the risk of diseases and cancers.

The research strength of AMU lies in the genetic study of skin diseases and researchers have made several important breakthroughs in this area. AMU has established one of the biggest biobanks of skin disorders in the world. Over 150,000 DNA and blood samples have been collected through a national network of hospitals and clinical centres around China. AMU has established an integrated research program on skin diseases, which covers upstream genetic epidemiology, downstream gene identification, mutation and variants detection, gene function investigation and cohort studies. The program has identified more than 10 monogenic skin disease loci (e.g. the gene *CYLD1* for Multiple Familial Trichoepithelioma) and 50 phenotype-specific mutations.

Recently, the genome wide association study (GWAS) of complex skin diseases psoriasis, systemic lupus erythematosus,

leprosy, vitiligo, atopic dermatitis and other skin diseases has helped AMU identify many disease susceptibility genes and gain novel insights into the pathology of these diseases. AMU has received multiple national awards in China for its scientific achievements, including the 2007 State Scientific and Technological Progress Award. In addition, the Chinese government named the GWAS of psoriasis, vitiligo and leprosy by AMU as one of China's Top Ten Scientific Breakthroughs in 2010.

AMU has one laboratory dedicated to the study of dermatology, namely the Key Laboratory of Dermatology of the Ministry of Education. The Ministry of Science and Technology has recently approved and appointed the Key Laboratory of Dermatology to become the State Key Laboratory and Incubation base of Dermatology.

Pharmacology

Pharmacology is one of the national key disciplines at AMU, and the Department of Clinical Pharmacology at AMU is one of China's earliest and leading departments in pharmacology. The program of pharmacology mainly touches on screening and characterization of efficacious compounds, as well as new anti-inflammatory and immunomodulating



drugs developed from herbs used in traditional Chinese medicine. The program also focuses on the study of pharmacokinetics, pharmacodynamics, drug–drug interaction and the working mechanism of traditional Chinese medicine using animal models and clinical trials. So far, the program has established animal models for rheumatoid arthritis, systemic lupus erythematosus, as well as renal and brain injuries.

Some of the major projects being undertaken are pathogenic mechanism of inflammatory and immune disease, new targets and mechanism of action for anti-inflammatory drugs and immunomodulating drugs. The total glucosides of peony have been approved as national class-II drugs. Clinical pharmacology, molecular pharmacology, neuropharmacology, cardiovascular pharmacology and quantitative pharmacology are also the important research fields at AMU. The Department of Clinical Pharmacology regularly conducts phase I–III clinical trials to test new drugs and assists the Ministry of Health and the State Food and Drug Administration to establish related guidelines. Their research specializes in the study of anti-depression, ischemic brain damage, Alzheimer's disease and pain relief.

Epidemiology

Epidemiology is one of the earliest research disciplines established at AMU, and the School of Public Health at AMU aims to improve public health through education and research. There are several research laboratories and groups for studying infectious diseases, chronic diseases, parasitic diseases, sexually transmitted diseases, developmental disorders and birth defects. The epidemiology study of these diseases has led to the discovery of environmental and genetic factor influencing disease risk and advanced our understanding on disease prevention and pathogenesis. Recently, genetic epidemiology has become the focus of research, concentrating on the exploration of gene–gene/gene–environment interactions and genotype–phenotype associations, as well disease risk evaluation using multidisciplinary approaches.

Other areas

AMU has a reproductive medicine program for studying *in vitro* fertilization, embryo transfer, techniques for freezing and thawing oocytes and embryos, pre-implantation diagnosis and *in vitro* oocyte maturation. The aim of the program is to understand how lipopolysaccharides induce developmental toxicity and teratogenesis.

AMU has a cancer program that aims to study the effects of genetic and environmental factors on tumorigenesis and tumour malignant behaviour, as well as identify anti-tumour agents, such as small molecular inhibit compounds based on SHP-2 PTP domain and antioxidant from natural food.

The Laboratory of Neuropsychology studies the biology and neuropsychology of schizophrenia, depression, anxiety, stroke, and aging related disease. A geriatrics program aims to find the molecular mechanism underlying Alzheimer's disease. Recently, researchers at the Laboratory of Neuropsychology have found that stress in the endoplasmic reticulum plays an important role in the pathogenesis of neurodegenerative diseases. They are now studying the processes underlying fear and anxiety, as well as the neural basis of memory, attention and social behaviour. An epilepsy group aims to find the molecular and cellular mechanisms underlying epilepsy and search for potential anti-epilepsy agent.



安徽医科大学

www.ahmu.edu.cn/english/



BGI

ACCELERATE YOUR SCIENTIFIC EXPLORATION

An overview

BGI — formerly known as Beijing Genomics Institute — was founded in Beijing, China, on 9 September 1999. The company's mission is to become a premier scientific partner of the global research community and to make cutting-edge genomic science widely accessible through its technological investment, economies of scale and bioinformatics expertise. BGI, and its affiliates, BGI Americas and BGI Europe, have established partnerships and collaborations with leading academic institutes and government research bodies as well as global biotechnology and pharmaceutical companies, supporting a variety of disease, agricultural, environmental and related applications.

BGI has established a proven track record of excellence, delivering results with high efficiency and accuracy for innovative, high-profile research that has been published to date in more than 130 top-tier academic journals.

BGI has sequenced 1% of the human genome for the International Human Genome Project and 10% of the human genome for the International Human HapMap Project, carried out research to combat SARS, played a key role in the Sino-British Chicken Genome Project

and sequenced the complete genome of rice, silkworm, and, most recently, the first Asian man.

In addition to these projects, BGI has established its own technical platforms for large-scale genomic sequencing, efficient bioinformatics analyses and innovative genetic health care initiatives. These achievements have greatly contributed to the development of genomics in both Asia and the world, and have established BGI as a world-class research institution.

Recent achievements:

The Soybean Resequencing Project

Lam, H. M. *et al.* Resequencing of 31 wild and cultivated soybean genomes identifies patterns of genetic diversity and selection. *Nature Genetics* **42**, 1053–1059 (2010).

The 1000 Genomes Project Consortium

Durbin, R. M. *et al.* A map of human genome variation from population-scale sequencing. *Nature* **467**, 1061–1073 (2010).

The Maize Resequencing Project

Lai, J. *et al.* Genome-wide patterns of genetic variation among elite maize inbred lines. *Nature Genetics* **42**, 1027–1030 (2010).

The Diabetes-associated Genes and Variations Study (LuCAMP)

Li, Y. *et al.* Resequencing of 200 human exomes identifies an excess of low-frequency non-synonymous coding variants. *Nature Genetics* **42**, 969–972 (2010).

The Ant Genome Project

Bonasio, R. *et al.* Genomic comparison of the ants *Camponotus floridanus* and *Harpegnathos saltator*. *Science* **329**, 1068–1071 (2010).

The Exome Project for High Altitude

Yi, X. *et al.* Sequencing of 50 human exomes reveals adaptation to high altitude. *Science* **329**, 75–78 (2010).

A method for studying methylome map in silkworm

Xiang, H. *et al.* Single base-resolution methylome of the silkworm reveals a sparse epigenomic map. *Nature Biotechnology* **28**, 516–520 (2010).

The Rice Transcriptome Project

Zhang, G. *et al.* Deep RNA sequencing at single base-pair resolution reveals high complexity of the rice transcriptome. *Genome Research* **20**, 646–654 (2010).

The Human Metagenome Project

Qin, J. *et al.* A human gut microbial gene catalogue established by metagenomic sequencing. *Nature* **464**, 59–65 (2010).

The Ancient Human Genome Project

Rasmussen, M. *et al.* Ancient human genome sequence of an extinct Palaeo-Eskimo. *Nature* **463**, 757–762 (2010).

The International Giant Panda Genome Project

Li, R. *et al.* The sequence and *de novo* assembly of the giant panda genome. *Nature* **463**, 311–317 (2010).

The Human Pan-genome Project

Li, R. *et al.* Building the sequence map of the human pan-genome. *Nature Biotechnology* **28**, 57–63 (2010).

The Cucumber Genome Project

Huang, S. *et al.* The genome of the cucumber, *Cucumis sativus* L. *Nature Genetics* **41**, 1275–1281 (2009).

The Silkworm Resequencing Project

Xia, Q. *et al.* Complete resequencing of 40 genomes reveals domestication events and genes in silkworm (*Bombyx*). *Science* **326**, 433–436 (2009).

Yanhuang Project

Wang, J. *et al.* The diploid genome sequence of an Asian individual. *Nature* **456**, 60–65 (2008).

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