

Tsinghua Newsletter

ISSUE
37

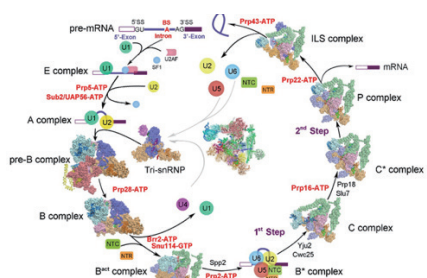
May
2018



Tsinghua International Graduate School at Shenzhen (Phase I) Project officially initiated



Tsinghua University defends its title as the ASC18 Champion



Yigong Shi's Group Elucidated the cryo-EM structures of the fully assembled *Saccharomyces cerevisiae* spliceosome before activation



Tsinghua International Graduate School at Shenzhen (Phase I) Project officially initiated

On May 7th, the groundbreaking ceremony of the Tsinghua International Graduate School at Shenzhen (Phase I) Project (the campus of Tsinghua-Berkeley Shenzhen Institute) took place in Shenzhen.

Chen Rugui, the Mayor of Shenzhen, Gao Zimin, the Vice Mayor of Shenzhen, Qiu Yong, the President of Tsinghua University, You Zheng, the

Vice President of Tsinghua, and Carol T. Christ, Chancellor of the University of California, Berkeley, together attended the ceremony, which was hosted by Zhang Lin, the Co-Director of the Tsinghua-Berkeley Shenzhen Institute.

In his address, Qiu Yong extended his thanks to the Shenzhen Municipal People's Government,

the University of California, Berkeley, and people in varied sections of society for their long-term care and support for Tsinghua.

He noted that since Tsinghua and Shenzhen's joint establishment of the Research Institute of Tsinghua University in Shenzhen in 1996, Tsinghua and the city in southern China have achieved many firsts. In 2001, Tsinghua and Shenzhen co-founded the Graduate School at Shenzhen, Tsinghua University, which was Tsinghua's first graduate school outside Beijing. In 2014, the Tsinghua-Berkeley Shenzhen Institute was founded, and in 2016, Tsinghua signed an agreement with Shenzhen with the intention of establishing the Tsinghua International Graduate School at Shenzhen.

Qiu also noted that the Graduate School has three defining characteristics – it is international, innovative, and committed to the training of top-tier creative talents. He believed



that in the future, the Tsinghua International Graduate School at Shenzhen would definitely accomplish fruitful outcomes in its internationalization, the achievement of innovative results, and the education of creative talents.

Chancellor Carol Christ noted that the Tsinghua-Berkeley Shenzhen Institute, as an institution co-founded by two outstanding universities of their respective countries, has in the past few years testified to its robust

strength in nurturing talents and gathering excellent faculty members. The launching of the construction project of the new campus constitutes a new starting point for Tsinghua's international education.

Zhang Lin noted that the initiation of the project signifies that Tsinghua has entered a new historical stage in its collaborative education in Shenzhen. The School will contribute to the implementation of Tsinghua's

Global Strategy and Shenzhen's construction of its international higher education system.

It is estimated that the Tsinghua International Graduate School at Shenzhen (Phase I) will be inaugurated in 2021.



Tsinghua University defends its title as the ASC18 Champion

On May 9th, the final of the ASC 2018 Student Supercomputer Challenge (ASC18) was held successfully at Nanchang University, Jiangxi Province. The Tsinghua Team defended their championship by completing the highest number of tasks.

In addition to independent designing and building

supercomputers up to 3000 watts, the teams entering the final round were required to run HPL/HPCG benchmark, tackle problems in AI machine reading and comprehension, along with optimizing cutting-edge scientific and engineering applications including RELION – a core application of the cryo-EM that won the

2017 Nobel Prize in Chemistry, and NASA's famous computational fluid-dynamics code CFL3D.

Until now, the Tsinghua teams, comprised of undergraduate students from the Department of Computer Science and Technology, have been top in the Challenge five times in the past seven ASC Student Supercomputer Challenges.

ASC18 was jointly organized by the Asia Supercomputer Community, Inspur Group and Nanchang University. More than 300 teams from colleges and universities all over the world signed up for the Challenge, with 20 teams entering the final round.

The members of the Tsinghua team are mainly third-year

and fourth-year students from the Department of Computer Science and Technology. Their instructors are Zhai Jidong, Associate Professor of the Department, and Han Wentao, a postdoc.

The ASC Student Supercomputer Challenge was launched in 2012. It is one of the three most influential international supercomputing competitions for university students

in the world. The other two are the Student Cluster Competition (SCC), launched in the US in 2007, and the ISC-HPCAC Student Cluster Competition, initiated in Germany in 2012.

ASC aims to promote the exchange and training of young supercomputing talents in various countries and regions via competitions, enhance the application and R&D of supercomputing, drive

technological advance by supercomputing, and promote technological and industrial innovation.

The ASC Student Supercomputer Challenge has been held for seven consecutive years. This year, it attracted more than 5,500 university students from all over the world. It is currently the world's largest and most widely participated-in supercomputing competition for college students.



Yigong Shi's Group Elucidated the cryo-EM structures of the fully assembled *Saccharomyces cerevisiae* spliceosome before activation

On May 25th 2018, Professor Yigong Shi's group in the School of Life Sciences, Tsinghua University, published an article entitled "Structures of the fully assembled *Saccharomyces cerevisiae* spliceosome before activation" in the prestigious international magazine *Science*. The paper reported the cryo-EM structures of the precursor pre-catalytic spliceosome (the pre-B complex) and pre-catalytic spliceosome (the B complex) in *Saccharomyces cerevisiae*, at the average resolutions of 3.3-4.6 angstrom and 3.9 angstrom, respectively. These structures of the two crucial

complexes for RNA splicing before activation represent an important step towards a complete dissection of the spliceosome assembly, activation, and catalysis.

In 1977, scientists observed that adenovirus mRNA could not form a continuous double-stranded RNA-DNA hybrid duplex with its corresponding DNA transcription template. Instead, single-stranded DNA bulges were extended at different positions in the hybridized double-stranded RNA-DNA duplex. This discovery suggested that the transfer of genetic information from DNA to mRNA not only involved transcription but also pre-mRNA splicing, which is to further remove the non-coding regions (introns)

Structures of the fully assembled *Saccharomyces cerevisiae* spliceosome before activation

Rui Bai,^{1*} Ruixue Wan,^{1*} Chuangye Yan,^{1*} Jianlin Lei,^{1,2} Yigong Shi^{1,2†}

¹Beijing Advanced Innovation Center for Structural Biology, Tsinghua-Peking Joint Center for Life Sciences, School of Life Sciences and School of Medicine, Tsinghua University, Beijing 100084, China. ²Technology Center for Protein Sciences, Ministry of Education Key Laboratory of Protein Sciences, School of Life Sciences, Tsinghua University, Beijing 100084, China. ³Institute of Biology, Westlake Institute for Advanced Study, Westlake University, 18 Shilongshan Road, Xihu District, Hangzhou 310064, Zhejiang Province, China.

*These authors contributed equally to this work.

†Corresponding author. Email: shi-lab@tsinghua.edu.cn

and connect the coding sequences (exons). RNA splicing is ubiquitous in eukaryotes. The average numbers of introns per gene increase from simple single-cell eukaryotes, such as yeast, to higher organisms such as

worms and flies, and all the way up to humans. Some pre-mRNAs can be spliced in more than one way. Therefore, mRNAs containing different combinations of exons can be generated from a given pre-mRNA.

Pre-messenger RNA (pre-mRNA) splicing is a crucial and the most complex step in the central dogma in eukaryotic cells. This process is executed by a dynamic mega-complex known as the spliceosome. From the discovery of RNA splicing in 1977 to the beginning of this century, scientists have recapitulated assembly and disassembly of the spliceosome by immunoprecipitation, gene knockout, cross-linked mass spectrometry, and in vitro splicing reaction and other methods. The essence of RNA splicing is the removal of intron and connection of exons through two successive transesterification reactions in which phosphodiester linkages within the pre-mRNA are broken and a new one is formed. To catalyze splicing of the pre-mRNA, the spliceosome has to undergo extremely precise stepwise assembly by forming a series of spliceosomal complexes. Based on the assembly and catalytic states and the biochemical composition of the spliceosome, these spliceosomal complexes have been defined as the A, pre-B, B, Bact, B*, C, C*, P, and ILS complexes.

Precursor pre-catalytic spliceosome (pre-B complex) is a highly

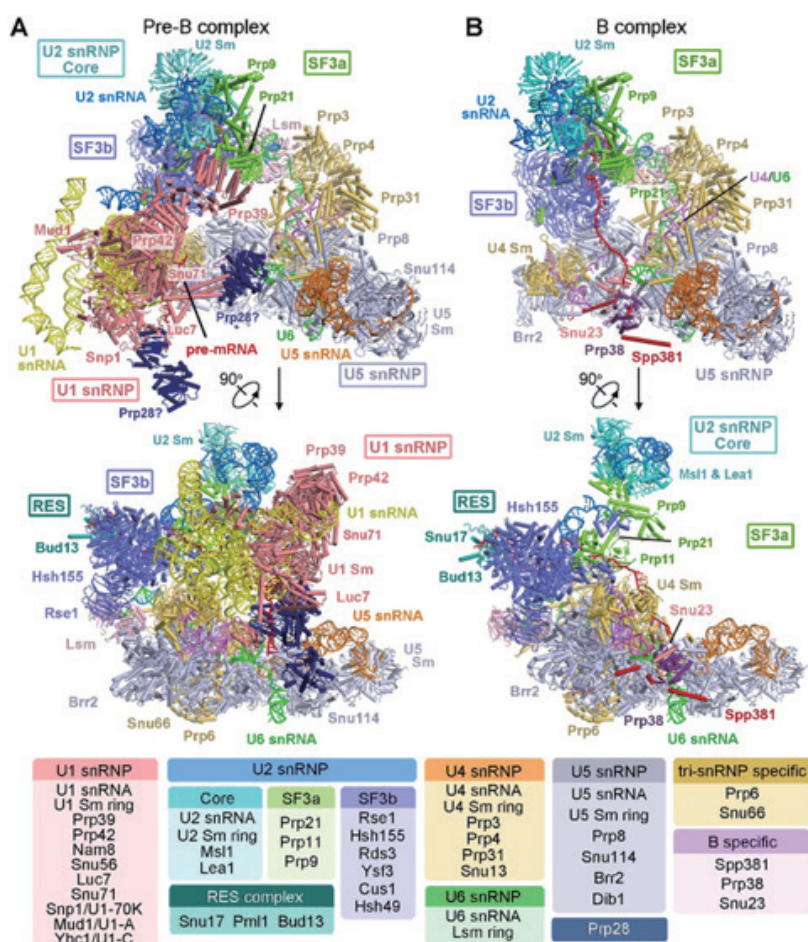


Figure 1. Structures of precursor pre-catalytic spliceosome (pre-B complex) and pre-catalytic spliceosome (B complex) from *S. cerevisiae*.

dynamic and transient complex that is difficult to obtain under normal physical conditions. In their recent Science paper, Shi and colleagues enriched pre-B complex samples from *S. cerevisiae* cells through over-expression of an ATPase-defective Prp28 mutant, leading to the blockage of the dissociation of U1 snRNP in vivo. Then they acquired the good pre-B and B complexes by applying TAP purification strategy and determined the three-dimensional structures by single particle cryo-EM, and built the atomic model (Figure 1). The structure of the *S. cerevisiae* pre-B complex contains 68 discrete proteins, five snRNA molecules, and the pre-mRNA. Structural elucidation of the pre-B complex fills an important void in the mechanistic understanding of pre-mRNA splicing by the spliceosome. The local resolutions of the core of U1 snRNP and the tri-snRNP reach 3.0 angstrom, which enabled assignment of atomic features. Advent of the pre-B structure, along with other published information, reveal the molecular mechanism for assembly and activation of the *S. cerevisiae* spliceosome. Remarkably, the structure of the pre-B complex for the first time revealed the recognition mechanism of 5'SS of the pre-mRNA by U1 snRNP. The authors propose that the structure of the A complex may be faithfully represented in the pre-B complex (Figure 2). Therefore, these two structures provide important structural evidence to illustrate the mechanism of 5'SS recognition by U1 snRNP and the spliceosome assembly and activation, which collectively advance our understanding of pre-mRNA splicing.

The Shi Group has been focusing on the structural and mechanistic elucidation of pre-mRNA splicing in the past decades. After the success of crystal structural elucidation of sub-complexes within spliceosome, they took a direct assault on the intact spliceosome and made the breakthrough

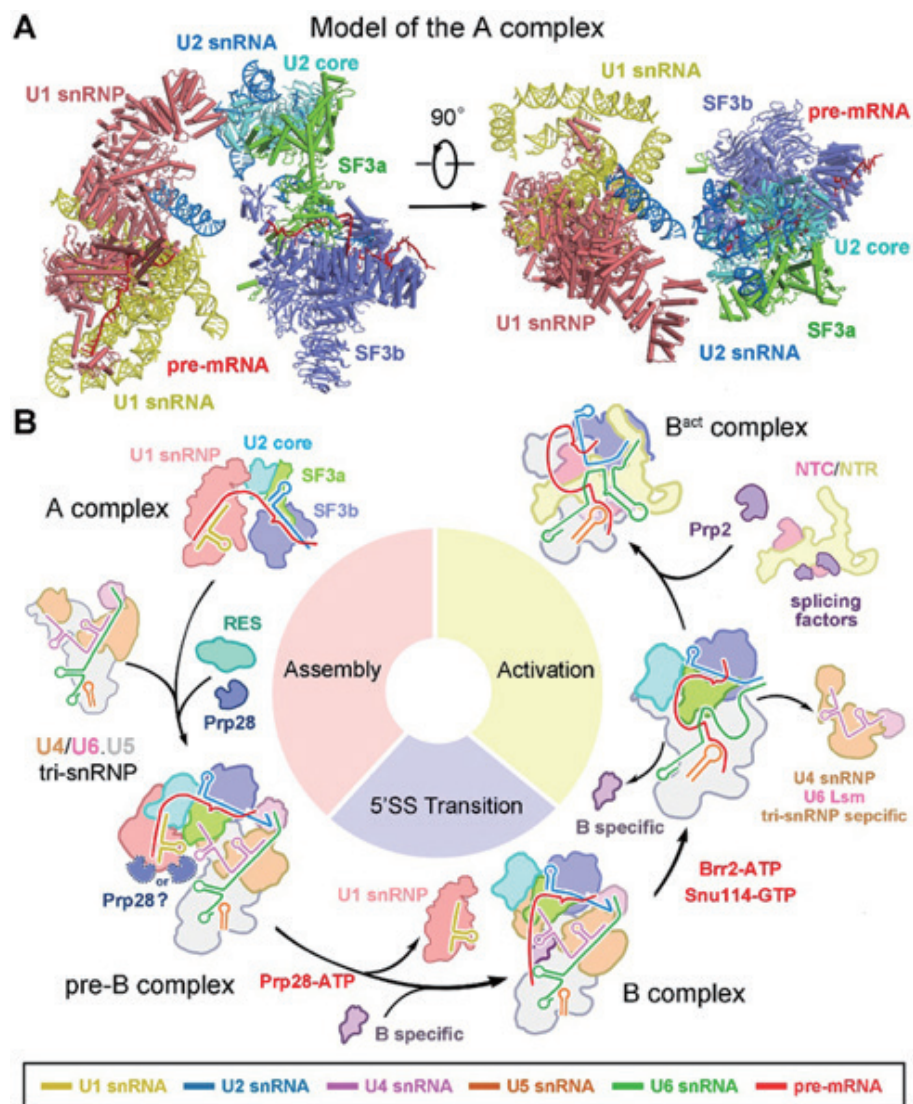


Figure 2. Mechanism of assembly and activation of the spliceosome in *S. cerevisiae*.

in the summer of 2015. Since then, the Shi lab has reported nine high resolution structures of the crucial spliceosomal complexes, including the *S. pombe* intron lariat spliceosome ILS complex at 3.6 angstrom, the pre-assembled U4/U6.U5 tri-snRNP at 3.8 angstrom, the activated spliceosome Bact complex at 3.5 angstrom, the catalytic step I spliceosome C complex at 3.4 angstrom, the step II catalytically activated spliceosome C* complex at 4.0 angstrom, the post-catalytic spliceosomal P complex at 3.6 angstrom, the ILS complex at 3.5 angstrom from

S. cerevisiae and the newest published precursor pre-catalytic spliceosome (pre-B complex) and pre-catalytic spliceosome (B complex) at 3.3-4.6 and 3.9 angstrom, respectively. These nine high resolution structures nearly cover all the essential functional states for spliceosome assembly, catalysis and disassembly, which provide unprecedented insight into the chemical basis for RNA splicing (Figure 3).

Prof. Yigong Shi is the corresponding author. Rui Bai (3th-year PhD student from the School of Life Sciences), Dr. Ruixue Wan (post-doc

fellow from the School of Medicine), and Dr. Chuangye Yan (post-doc fellow from the School of Life Sciences and Center for Life Sciences) are the co-first authors of this paper. Dr Jianlin Lei provided technical support on the EM data collection. EM images were acquired at the Tsinghua University Branch of the China National Center for Protein Sciences (Beijing). Data processing was performed on the “Explorer 100” cluster system of Tsinghua National Laboratory for Information Science and Technology, the Computing Platform of China National Center for Protein Sciences (Beijing). This research was funded by the Beijing Innovation Center for Structural Biology and the National Natural Science Foundation of China.

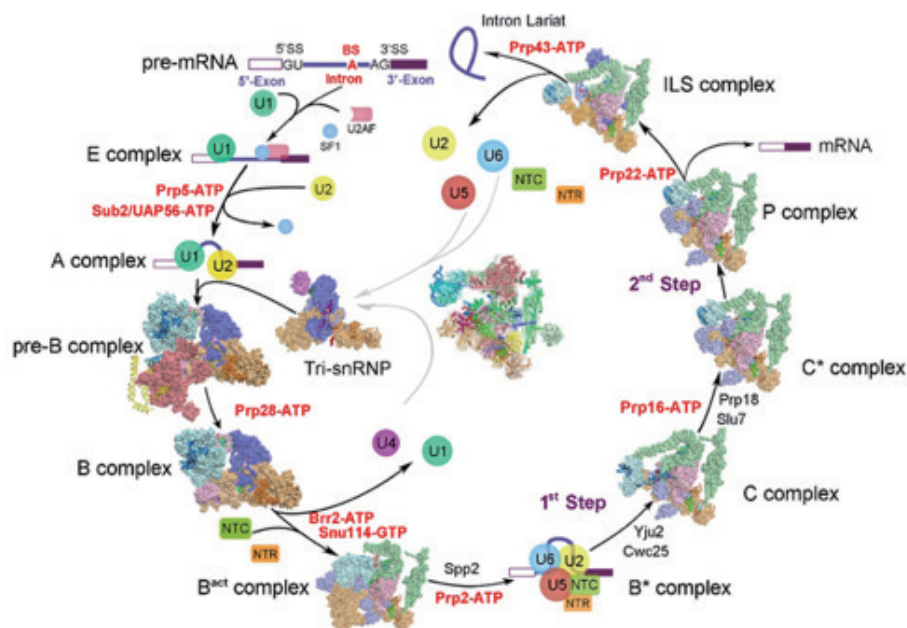


Figure 3. Cryo-EM structure of yeast spliceosome solved by Shi lab.

The original link:

<http://science.sciencemag.org/content/early/2018/05/23/science.aau0325>

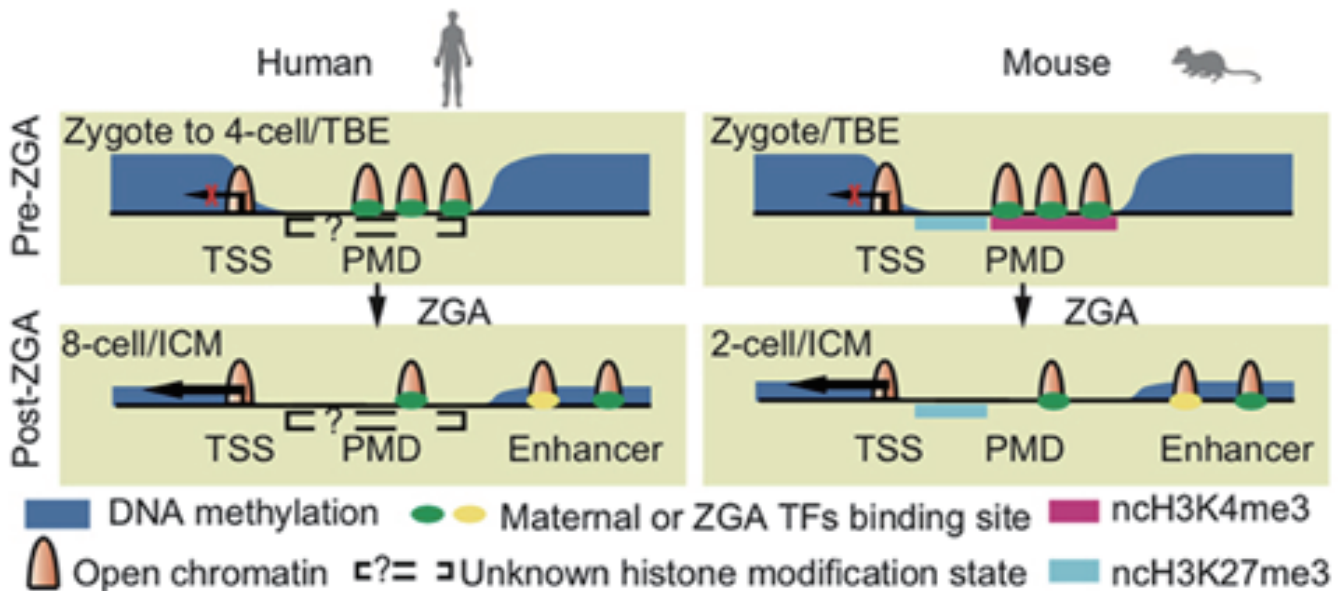
Related publications:

- <http://science.sciencemag.org/content/early/2016/01/06/science.aad6466>
- <http://science.sciencemag.org/content/early/2015/08/19/science.aac8159>
- <http://science.sciencemag.org/content/early/2015/08/19/science.aac7629>
- <http://science.sciencemag.org/content/early/2016/07/20/science.aag0291>
- <http://science.sciencemag.org/content/early/2016/07/20/science.aag2235>
- <http://science.sciencemag.org/content/early/2016/12/14/science.aak9979.full>
- [http://www.cell.com/cell/fulltext/S0092-8674\(17\)30954-6](http://www.cell.com/cell/fulltext/S0092-8674(17)30954-6)
- [http://www.cell.com/cell/fulltext/S0092-8674\(17\)31264-3](http://www.cell.com/cell/fulltext/S0092-8674(17)31264-3)

Wei Xie’s group, Yingpu Sun’s group and Jie Na’s group published research in Nature on chromatin regulation in early human development

By investigating the dynamics of chromatin states during human embryo development, a team led by two groups in Tsinghua University (Wei Xie’s group from the School of Life Sciences and Jie Na’s group from the School of Medicine), in close collaboration with Yingpu Sun’s group from the First Affiliated

Hospital of Zhengzhou University, has revealed the dynamic chromatin reprogramming process during human pre-implantation embryo development. Their findings, published in Nature on May 3rd 2018, not only advanced the understanding of chromatin reprogramming in human early embryo development, but also



A model shows the distinct transcription and chromatin states before and after ZGA in humans and mice.

provided a molecular framework for future studies on Assisted Reproductive Technology (ART) and related human diseases.

Human life starts from a fertilized egg, which undergoes a series of drastic chromatin reprogramming during its early embryonic development. In recent years, studies using the mouse model have shown that during early embryonic development, chromatin accessibility, the high order chromatin structure as well as the chromatin modifications, undergo tremendous changes on both parental alleles. These changes act in concert with the genome activation and result in a new totipotent embryo, allowing subsequent embryonic development and lineage specification. Previous reports have found that the regulatory elements are usually located in open chromatin. These regulatory elements together with cell type specific transcription factors guide cell fate determination. Analysis of chromatin accessibility enables the identification of regulatory elements and key transcription factors that bind to these elements. However, due to the extremely limited research materials that are available for

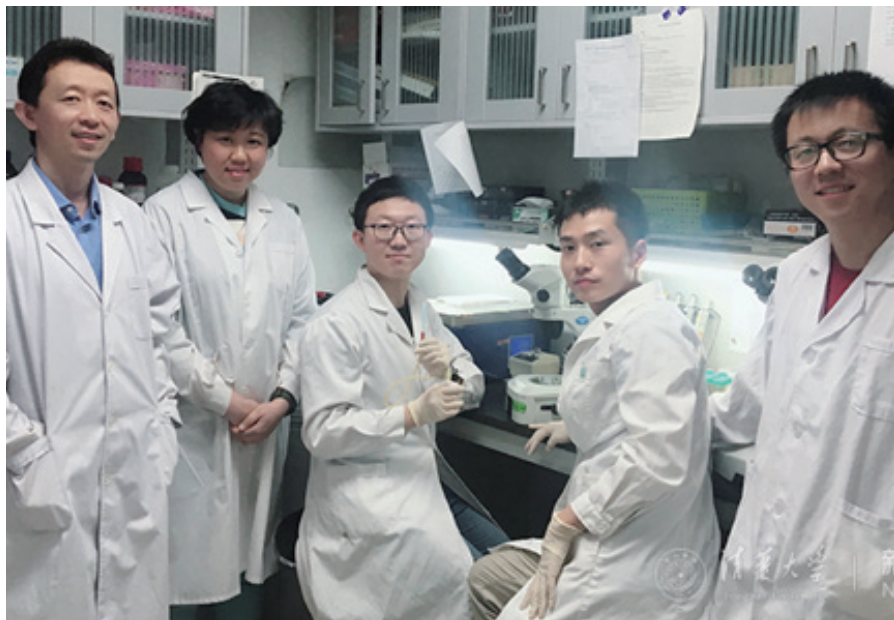
studying human early development, little is known about the chromatin state and its dynamics in early human embryos. To overcome this hurdle, Wei Xie's group developed an optimized ATAC-seq protocol that allows chromatin accessibility analysis using as few as 20 cells. By closely collaborating with Yingpu Sun's group from Center for Reproductive Medicine, the First Affiliated Hospital of Zhengzhou University, the landscape of chromatin accessibility during early human embryonic development was revealed. By working with Jie Na's group and using mouse embryos, the joint team uncovered both divergent and conservative mechanisms that govern chromatin reprogramming during early human and mouse development.

Through the study of chromatin accessibility in early human embryos, the researchers first identified putative transcription factors that may function during human preimplantation development. By comparing with previous results in mice from Wei Xie's group, both conserved and species-specific transcription factors were identified. Surprisingly, widespread open chromatin was also

found prior to zygotic genome activation (ZGA) in humans (1-4 cell) even when the transcription activities were minimal. Many such open chromatin regions reside in CpG rich promoters and are correlated with genes activated at the 8-cell stage. Unexpectedly, many open chromatin regions also fall into the distal regions and are enriched for transcription factor binding sites. Intriguingly, a large fraction of these sites become inaccessible with the onset of zygotic genome activation. A close examination revealed that these regions also overlap with DNA hypomethylated domains in human oocytes. In mice, DNA-hypomethylated regions in oocytes also preferentially enrich for open chromatin and non-canonical H3K4me3, a unique form of histone modifications that is linked to genome silencing at this developmental stage. The researchers proposed that such pre-ZGA specific open chromatin may serve as a "chromatin harbor" for docking or sequestering transcription factors. Closing these chromatin harbors upon ZGA may release transcription factors and allow them to bind to gene promoters and other regulatory elements to facilitate genome

activation. Taken together, these data not only reveal a conserved mechanism underlying chromatin transition during mammalian ZGA but also advanced our understanding about epigenome reprogramming during in vitro human fertilization and early development.

Prof. Yingpu Sun from the Center for Reproductive Medicine of the First Affiliated Hospital of Zhengzhou University, Prof. Wei Xie from the School of Life Sciences of Tsinghua University, and Prof. Jie Na from the School of Medicine of Tsinghua University are the co-corresponding authors of this work. Doctoral student Jingyi Wu, from the PTN program of the School of Life Sciences at Tsinghua University, doctoral student Bofeng Liu, from the CLS program of the School of Life Sciences at Tsinghua University, postdoc fellow Zili Lin, doctoral student Peizhe Wang, from the School of Medicine at Tsinghua University, Dr. Jiawei Xu and Dr. Guidong Yao from the Center for Reproductive Medicine of the First Affiliated Hospital of Zhengzhou



University are the co-first authors of this work. Collaborators include Professor Wei Li and graduate student Xuepeng Wang from the Institute of Zoology, Chinese Academy of Sciences. Bo Huang from Peking University also made an important contribution to the study. This study was supported by funding from the National Key R&D Program of China, the National Basic Research Program of China (973 program), the National Natural

Science Foundation of China, funding from the THU-PKU Center for Life Sciences and the HHMI International Research Scholar Award, and also by the animal facility, the sequencing facility and the computation facility at Tsinghua University.

Link to the Paper:

<https://www.nature.com/articles/s41586-018-0080-8>

International Cultural Festival celebrated at Tsinghua

Source: China Daily
Editor: Zhu Lvhe



The opening ceremony of the 9th Tsinghua University International Cultural Festival and the Global Village 2018-World Expo on Saturday drew wide attention from a variety of people, ranging from ambassadors to students.

The Festival, one of Tsinghua's biggest events celebrating international culture, attracted over 6,000 Chinese and foreign participants, including the South Sudanese Ambassador Monday Semaya, the Ghanaian Ambassador Edward Boateng, and the

university's leaders.

More than 200 international students from about 50 countries and regions staffed 60 exhibition booths at the event.

Guo Yong, Vice Chairperson of the University Council, spoke at the opening. He said that Tsinghua serves as an international community to all students, and continues to attract international talents.

The Festival is a chance for students from different cultural backgrounds to enhance mutual understanding and bring Chinese and international students together.

Monday Semay, South Sudan's Ambassador to China, praised the active role the event plays in promoting multicultural exchanges, and thanked Tsinghua University for its quality education for overseas talents.

Country representatives in each of the 60 booths tried their best to



attract visitors through sharing traditional food and various performances.

The activity received a warm response from participants. "The Festival is giving an opportunity for expats to learn from other cultures. It's my pleasure to be part of it," said Sri Rajeevan, a 28-year-old student from Sri Lanka who's studying public health in Tsinghua.

In addition, another four sub-events will take place in the same week: "YEAH! World" Culture Series,

a football match between the international football teams of Tsinghua University and Beijing Language and Culture University, "Vision in Tsinghua, Dialogue with Ambassadors"-the Republic of Korea and the Tsinghua's Got Talent Show.

The Festival is run by the International Students & Scholars Center (ISSC) and organized by the

Tsinghua University Association of Student International Communication (ASIC), the Tsinghua University Students' Association of International Culture Exchange (AICE), and the Tsinghua Shuō Student Society of World Culture and Language Communication.

The Festival ended on May 19th.

Graduation artworks on display



On May 16th, the 2018 Postgraduate Work Exhibition of the Academy of Arts & Design, Tsinghua University, officially opened at the Tsinghua University Art Museum. It celebrates the graduation artworks of postgraduates from both the Academy and Tsinghua's Graduate School at Shenzhen.

Lu Xiaobo, Dean of the Academy of Arts & Design, attended the opening ceremony and delivered an address.

This year, the Exhibition was jointly organized by the Academy and

the Graduate School at Shenzhen, and the artworks are on display at both the University Art Museum and the Academy. Nearly 220 postgraduates took part in the Exhibition, and the overall number of artworks on display amounts to about 900.

The Exhibition closed on June 8th.



Tsinghua-Alberta Joint Research Center unveiled

Writer: Galia Popov



On May 17th, President Qiu Yong of Tsinghua University and President and Vice-Chancellor David H. Turpin of the University of Alberta met for the opening ceremony of the Tsinghua University-University of Alberta Joint Research Center for Future Energy and Environment. Turpin is the 13th president of the University of Alberta, which is one of the leading Canadian universities in Canada-China academic relations.

Both presidents expressed their wish to continually improve cooperation between the two universities.

Qiu opened the meeting by welcoming President Turpin and his colleagues from the University of Alberta. He mentioned that the two universities have a long history of cooperation and expressed his wish that the new Center will be a milestone in the alliance between Tsinghua and the University of Alber-

ta. According to Qiu, this partnership is one of Tsinghua's most important international partnerships. Turpin agreed, and noted that he is looking forward to seeing the relationship continue to grow.

Qiu and Turpin both emphasized the global importance of protecting the environment. Turpin stressed that clean energy is one of the largest issues of our time, and one that will require cooperation to solve. The Tsinghua University-University of Alberta Joint Research Center for Future Energy and Environment is a strategic international research center focused on discovering newer, more innovative and sustainable ways to produce energy. Tsinghua and the University of Alberta are dedicated to working towards a solution together.

After the discussion, the Presidents unveiled a plaque to mark the official opening of the new Center.

Tsinghua achieves big breakthrough in fabricating superstrong carbon nanotube fibers



Tsinghua University's Department of Chemical Engineering and School of Aerospace Engineering have recently made a breakthrough in the field of ultra-strong carbon nanotube (CNT) fibers. The research, which was led by Professor Wei Fei, Dr. Zhang Rufan, and Professor Li Xide's groups, has solved one of the

major challenges in developing CNT bundles whilst minimizing fiber defects and maintaining strength.

Carbon nanotubes are considered to be one of the strongest materials ever discovered. One of the potential applications of CNTs is for making space elevators, which were first proposed as a convenient and efficient

way to get into the outer space by the rocket scientist, Konstantin Tsiolkovsky in 1895. One of the major challenges in developing such a technology is finding a lightweight but superstrong fiber. The technological breakthrough of ultra-strong CNT fibers also exhibits promising application potential in many other fields such as sports equipment, ballistic armor, aeronautics, and astronautics, and related fields.

The breakthrough was achieved by fabricating CNT bundles via a method known as in-situ gas flow focusing and enhancing their tensile strength via a method called synchronous tightening and relaxing. This process enabled bundles of CNTs, around a centimeter in length, to be produced without defects and oriented in a uniform fashion with uniform initial strain/stress. These bundles have a tensile strength of over 80 GPa, which is much higher than that of previously reported fibers.

The work, published in *Nature Nanotechnology*, reveals a bright prospect for superstrong fibers made of ultralong carbon nanotubes.

Link to the Paper:

<https://www.nature.com/articles/s41565-018-0141-z>

Tsinghua holds the Second International Forum on Future World, Future Learning

The second International Forum on Future World, Future Learning, jointly hosted by Tsinghua's Institute for Future Education and Evaluation, as well as the Institute of Education, was held recently in the Main Building.

The Forum organized multiple discussions on the future trends in education, the change of the paradigm for education in the future, innovative talent training and identification, and the Chinese language

proficiency test, among other topics. The organizers of the Forum have invited 14 interdisciplinary experts in such fields as education, cognitive psychology, brain science, artificial intelligence, international language assessment, and domestic linguistics. There were over 200 people from different colleges, universities, scientific and educational institutions and enterprises attending the Forum.

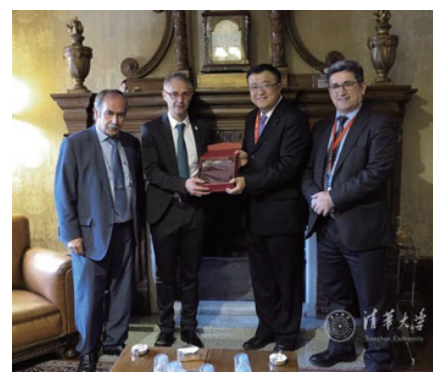


Yang Bin visits Universidad de Salamanca and attends Fourth International Universia Rectors' Meeting

On May 21st and 22nd, Yang Bin, Vice President and Provost of Tsinghua University, paid a visit to Spain and attended the Fourth International Universia Rectors' Meeting held in Salamanca. During the meeting, Yang Bin also visited the Universidad de Salamanca, which was celebrating its 800th anniversary, and engaged in

discussion with the Spanish university regarding possible collaborative programs.

The Fourth International Universia Rectors' Meeting was organized by Banco Santander and took place at the Universidad de Salamanca. This year's general theme was "University, Society and Future", and over 1000



leaders from 800 universities, governments and organizations all over the world participated in the meeting. The three sub-topics this year were "Training and Learning in a Digital World", "Researching at University: A Paradigm under Review", and "Contribution to Social and Territorial Development".

During his stay in Spain, Yang Bin met with Mr. Ricardo Rivero Ortega, Rector of the Universidad de Salamanca, and Mr. Efrem Yildiz Sadak, Vice-Rector of International Relations. They came to the agreement that the two universities will engage in further discussions on establishing specific collaborative programs, starting with students' language and cultural exchanges.



Inditex Group of Spain supports Tsinghua in setting up the “Tsinghua-Inditex Belt and Road Education and Scholarship Fund”

On May 22nd (Central European Time), Yang Bin, Vice President and Provost of Tsinghua University, and Pablo Isla, Chairman and CEO of Inditex, signed an agreement to set up a “Tsinghua-Inditex Belt and Road Education and Scholarship Fund”. The signing ceremony was held in La Coruna, where Inditex Group’s headquarters is located.

The “Tsinghua-Inditex Belt and Road Education and Scholarship Fund” not only provides scholarships to students from the partner countries of the Belt and Road Initiative, but also supports students and faculty members from Tsinghua University to study, visit and take on short-term positions in these partner countries. “Friendship, which derives from close contact between the people, holds the key to sound state-to-state relations.” By setting up this fund, Inditex commits itself to helping Tsinghua to improve its capacity in training international students under the guidance of a more globally oriented new centennial strategy, to facilitating Tsinghua’s endeavors to strengthen people-to-people bonds through regional education exchanges, and to making contributions to the

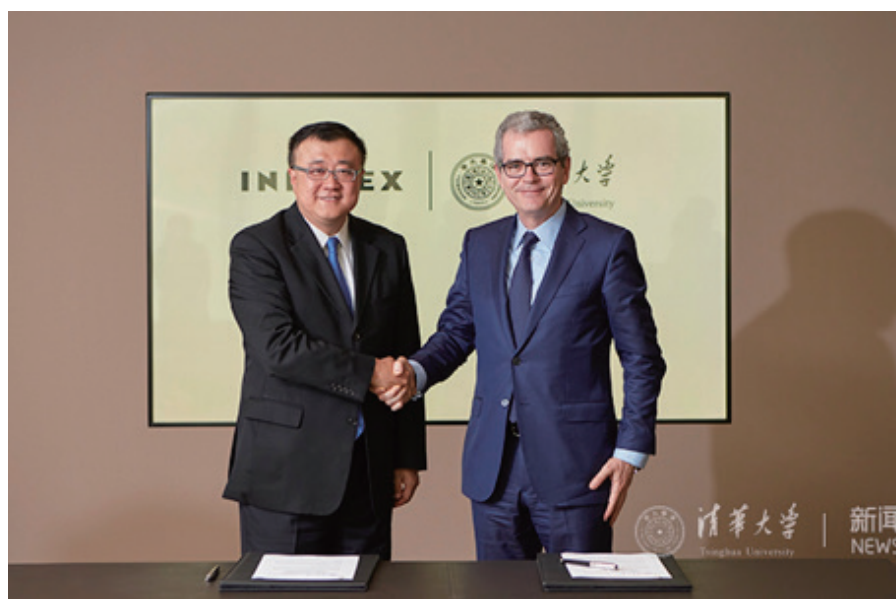
implementation of the Belt and Road Initiative in education.

At the signing ceremony, Yang Bin introduced Tsinghua’s recent achievements in international cooperation and invited Inditex to work more closely with Tsinghua in fields such as industrial design and sustainable development. Yang Bin expressed his appreciation towards the Inditex Group for its commitment to Tsinghua. He said that Inditex had consistently lent its support to Tsinghua in student development. Since 2016, Inditex has provided funding and study trip opportunities for MBA students from the Tsinghua University School of Economics and Management in their overseas exchanges. The creation of the “Tsinghua-Inditex Belt and Road Education and Scholarship Fund” will further deepen the cooperation between the two sides and help both parties to cultivate cultural inclusiveness and political mutual trust through in-depth education collaboration.

Pablo Isla noted that Inditex’s participation in the Belt and Road Initiative alongside Tsinghua University “is a fresh opportunity for the Group to support international and intercultural exchanges in which Spain is also involved. It also helps Inditex to better understand the Chinese academic and research reality”.

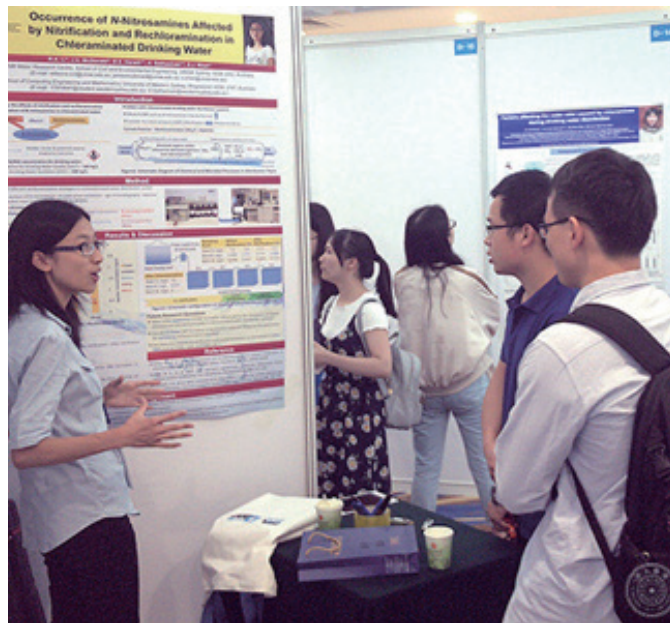
Jesus Echevarria Hernandez, Chief Communication Officer of Inditex Group, Yago Vera Cuartero, Greater China President of Inditex, Li Bing, Deputy General-Secretary of the Tsinghua University Education Foundation (TUEF), and Fu Xuan, Director of Development of TUEF, attended the signing ceremony.

Jesus Echevarria Hernandez, Chief Communication Officer of Inditex Group, Yago Vera Cuartero, Greater China President of Inditex, Li Bing, Deputy General-Secretary of the Tsinghua University Education Foundation (TUEF), and Fu Xuan, Director of Development of TUEF, attended the signing ceremony.



Yang Bin, Vice President and Provost of Tsinghua University, and Pablo Isla, Chairman and CEO of Inditex at the signing ceremony

Tsinghua jointly hosts the Second Disinfection and Disinfection By-Products Conference



The Second Disinfection and Disinfection By-Products Conference, jointly organized by the School of Environment, Tsinghua University, and the International Water Association (IWA), was held in Beijing from May 14th to 18th.

The conference focused on

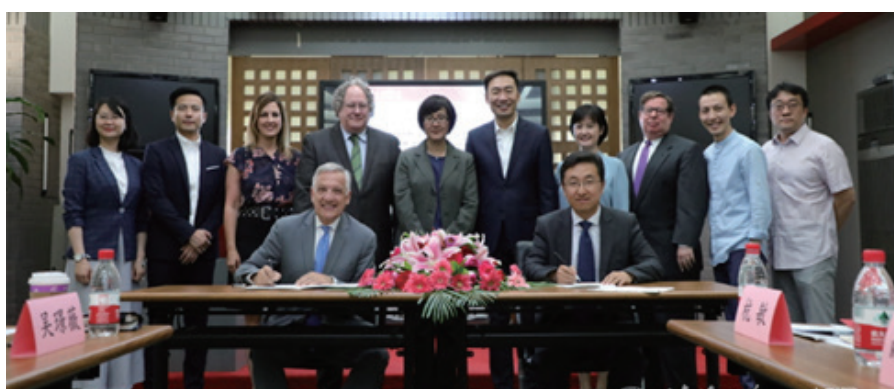
disinfection and microbiology, disinfection by-products, and related public health issues, among other topics. Twelve leading scientists and top-tier engineers were invited to give keynote speeches. 51 oral presentations were delivered and 62 posters selected from over 150 submissions

were presented during this conference. More than 220 researchers and practitioners from 15 countries or regions of Asia, North America, South America, Europe, Oceania, and Africa, attended the conference.

School of Journalism and Communication signs tripartite memorandum of understanding with USC schools

On May 28th, the School of Journalism and Communication of Tsinghua University (TSJC) signed a tripartite memorandum of understanding with the Annenberg School for Communication and Journalism and the Viterbi School of Engineering of the University of Southern California (USC)

Gao Hong, Vice Provost for International Education of Tsinghua, Professor Hu Yu, Secretary of the CPC TSJC Committee, Yannis C. Yortsos, Dean of the USC Viterbi School of Engineering, and Deng Feng, a Tsinghua alumnus and founder of the Northern Light Venture Capital, attended the signing ceremony.



Professor Chen Changfeng, Executive Dean of TSJC, and Professor Hu Yu signed the document on behalf of TSJC.

This tripartite memorandum of understanding establishes concrete plans for faculty exchanges among the three institutions, and for the joint

training of students, as well as for collaborative research projects. It also establishes a Media Entrepreneurship double-degree Master's program, which will focus on the application of data science in journalism and communication.