

---

# NEWSLETTER

---

AUGUST 2018

013



---

THE FUTURE OF SCIENCE IS GLOBAL

---



**INNOVATION**

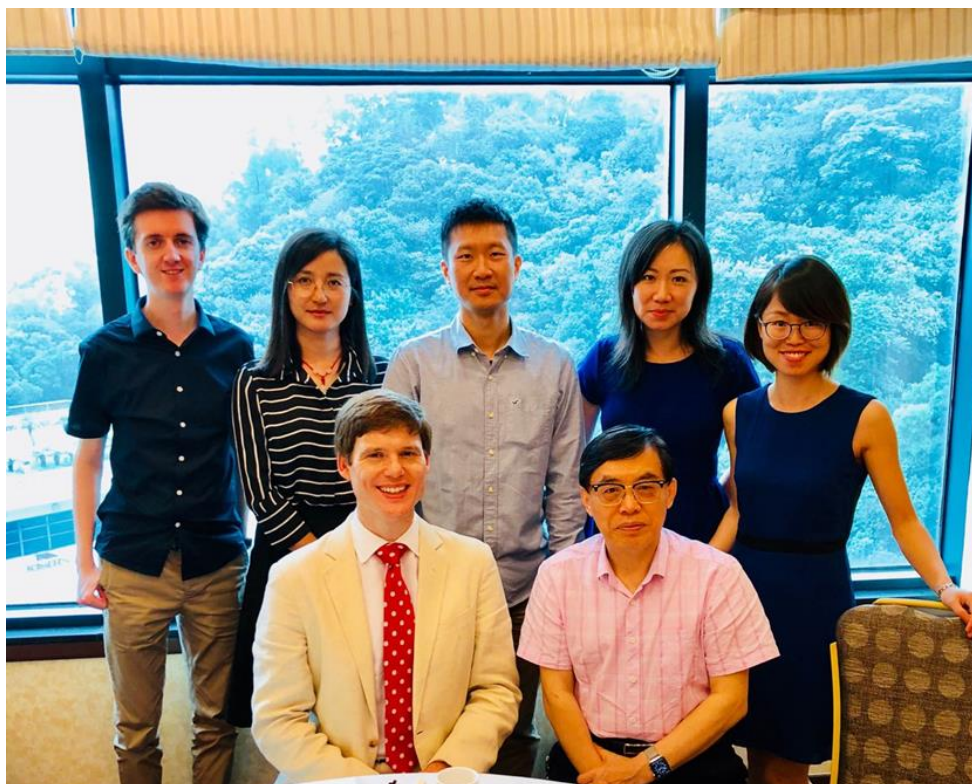




## **HEADLINES**

<b>CHI Lab Visits to South China.....</b>	<b>2</b>
<b>OSCAR First Paper Published.....</b>	<b>4</b>
<b>Karlsruhe Institute of Technology China Branch (Suzhou) Visited OSCAR.....</b>	<b>5</b>
<b>OSCAR Invited to Hangzhou BDMC 2018.....</b>	<b>6</b>
<b>OSCAR Visits to MEMSRIGHT.....</b>	<b>7</b>
<b>Progress of OSCAR's Fit-out and Construction in August.....</b>	<b>8</b>
<b>Meet OSCAR's New Staff.....</b>	<b>9</b>
<b>Neighbours of OSCAR</b>	
Xi'an Jiaotong University Suzhou School of Nano-Science & Nano-Engineering.....	<b>10</b>
<b>News Links in August</b>	
Cooperation Projects between China and UK.....	<b>11</b>
SIP AI Industry Park Opens.....	<b>12</b>

## CHI Lab Visits to South China



Front: Prof. David Clifton, Prof. Yuanting Zhang (L to R)

Back: Dr. Gert Mertes, Dr. Yang Yang, Dr. Ho Derek, Dr. Tingting Zhu, Dr. Xiaorong Ding (L to R)

The Computational Health Informatics (CHI) Lab, led by Oxford Principal Investigator David Clifton, visited potential academic and commercial collaborators in Hong Kong and Shenzhen, including some of China's largest technology firms.

Visits to the headquarters of Alibaba Health in Hong Kong, Huawei in Shenzhen, and Tencent in Shenzhen were fruitful. Each of the three companies has a different approach to healthcare applications as befits their backgrounds respectively in e-commerce (including e-pharmaceuticals), electronic devices (such as 'wearables'), and social media/services. At each meeting, the OSCAR team presented the 'business model' of collaboration that has proven successful in the UK, formed of (i) academic research, (ii) partnership with hospitals and healthcare providers, and (iii) industrial translational activities. With (i) and (ii) being developed by the OSCAR team, this trip gave Prof. David Clifton, Dr. Yang Yang, Dr. Tingting Zhu, Dr. Xiaorong Ding, and Dr. Gert Mertes the opportunity to explore (iii).

While in Hong Kong, the team also had meetings with Prof. Yuanting Zhang, Chair of Biomedical Engineering at City University of Hong Kong. The visit to UCF, an investment firm with interests in healthcare technology, rounded out the commitments in Hong Kong.

While continuing the trip to Shenzhen, the team had introductory meetings with the Catic Wellness Group, led by Dr. Lan Wang who is a successful entrepreneur in China and an engineer by education. Catic runs large networks of "wellness clinics", which again offers a complementary view of healthcare to other potential collaborations.





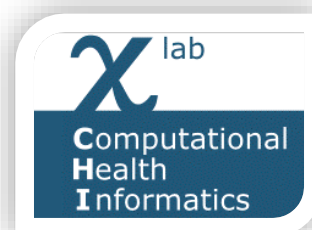
Group picture of CHI lab and Shenzhen Center for Chronic Disease Control team.

Other highlights included visits to Shenzhen Center for Chronic Disease Control, a government-run regional body with responsibility for preventing and fighting chronic diseases. A day of presentations and discussions with Director Yu and his team focused on research area within Center's remit that would potentially benefit from the use of AI-based technology. The Shenzhen Institutes of Advanced Technology, representing the Chinese Academy of Sciences, welcomed the CHI Lab team for lectures and discussions, where both sides had mutual interests in developing technologies for healthcare based on AI.

Computational Health Informatics (or CHI) laboratory focuses on "AI in healthcare", sometimes known as Clinical AI, and exists at the interface between machine learning and health informatics. Members of the lab share a common interest in deep learning, Bayesian inference, and related methods.

If interested, please visit the CHI Lab website for more information:

<http://www.robots.ox.ac.uk/~davidc/index.php>



## OSCAR First Paper Published

The first OSCAR paper *Differential and Interactive Effects of Substrate Topography and Chemistry on Human Mesenchymal Stem Cell Gene Expression* was published in the *International Journal of Molecular Sciences*. OSCAR research team members, Principal Investigator Professor Zhanfeng Cui, Associate Professor Hua Ye and senior research scientist Hui Wang, are three of the co-authors of this paper. Please see the abstract below for more information.

**Abstract:** Variations in substrate chemistry and micro-structure were shown to have a significant effect on the biology of human mesenchymal stromal cells (hMSCs). This occurs as differences in the surface properties indirectly modulate pathways within numerous signaling networks that control cell fate. To understand how the surface features affect hMSC gene expression, we performed RNA-sequencing analysis of bone marrow-derived hMSCs cultured on tissue culture-treated polystyrene (TCP) and poly (L-lactide) (PLLA) based substrates of differing topography (Fl: flat and Fs: fibrous) and chemistry (Pr: pristine and Am: aminated). Whilst 80% of gene expression remained similar for cells cultured on test substrates, analysis of differentially expressed genes (DEGs) revealed that surface topography significantly altered gene expression more than surface chemistry. The Fl and Fs topologies introduced opposite directional alternations in gene expression when compared to TCP control. In addition, the effect of chemical treatment interacted with that of topography in a synergistic manner with the Pr samples promoting more DEGs than Am samples in all gene ontology function groups. These findings not only highlight the significance of culture surface on regulating the overall gene expression profile but also provide novel insights into cell-material interactions that could help design the next-generation biomaterials to facilitate hMSC applications, although further studies are required to investigate whether or not the observations noted correlate with subsequent protein expression and functionality of cells.

**Keywords:** human mesenchymal stromal cells; cell matrix interactions; electrospinning; next generation sequencing; transcriptome

Int. J. Mol. Sci. 2018, 19, 2344; <https://doi.org/10.3390/ijms19082344> (full text)



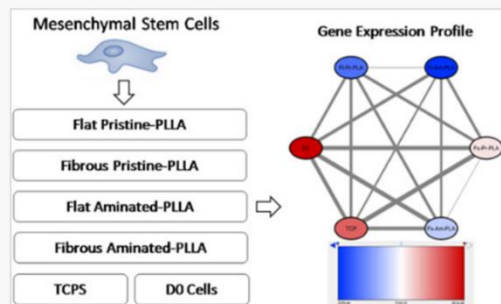
International Journal of  
Molecular Sciences



Article

### Differential and Interactive Effects of Substrate Topography and Chemistry on Human Mesenchymal Stem Cell Gene Expression

Qiongfang Li <sup>1,†</sup>, Bo Zhang <sup>2,3,†</sup>, Naresh Kasoju <sup>2,†</sup>, Jinmin Ma <sup>1,†</sup>, Aidong Yang <sup>3</sup>, Zhanfeng Cui <sup>2</sup>, Hui Wang <sup>1,2,4,\*</sup> and Hua Ye <sup>2,\*</sup>



Graphical abstract

## Karlsruhe Institute of Technology China Branch (Suzhou) Visited OSCAR

On August 16, Karlsruhe Institute of Technology (KIT) China Branch visited OSCAR to exchange ideas and information and to discuss potential cooperation opportunities.



Yang Shun (R1), KIT China Branch Executive Director;

Zhang Ningning (L2), Suzhou SILU Production Engineering Services Co., Ltd. Project Engineer;

Li Hui (L3), KIT China Branch Governmental Affairs Officer

KIT is a renowned German research university with excellence in nuclear physics, nanotechnology, environment and energy. It set up KIT China Branch in Suzhou Dushu Lake Science and Education Innovation District in May 2014. Before that, KIT had established a company called SILU specializing in manufacturing technique and process control training in Suzhou Industrial Park. With this expansion, KIT combines its research work with Chinese industrial partners.

The KIT representation in Suzhou serves as an interdisciplinary platform to enhance cooperation projects between the KIT and its Chinese partners in the areas of education, research, and innovation.

To read more, please visit [http://www.kit.edu/kat/english/pi\\_2014\\_15147.php](http://www.kit.edu/kat/english/pi_2014_15147.php)



## OSCAR Invited to Hangzhou BDMC 2018

Hangzhou International Conference on Biomaterials, Bio-Design and Manufacturing (BDMC 2018) was held from August 27 to 28. Professor Cui, as Co-Chair, was invited to attend the conference. Dr. Weizhi Liu, a researcher in Professor Cui's group, attended the conference on behalf of Professor Cui.

Professor Huayong Yang (Academician, Chinese Academy of Engineering. Dean, School of Mechanical Engineering. Director, the State Key Laboratory of Fluid Power and Mechatronic Systems, Zhejiang University) delivered a welcome speech and introduced BDMC 2018.



The objective of BDMC 2018 is to promote academic exchanges of researchers from universities and industries in the field of biomanufacturing, with the hope to enhance the influence of a new journal called *Bio-Design and Manufacturing*, which was co-launched in 2018 by Springer and Zhejiang University Press about new research, technology and applications in biomanufacturing, particularly 3D bioprinting. All articles in this journal are available for free during 2018 and 2019. For more information please visit the following link: <https://www.springer.com/engineering/mechanical+engineering/journal/42242>



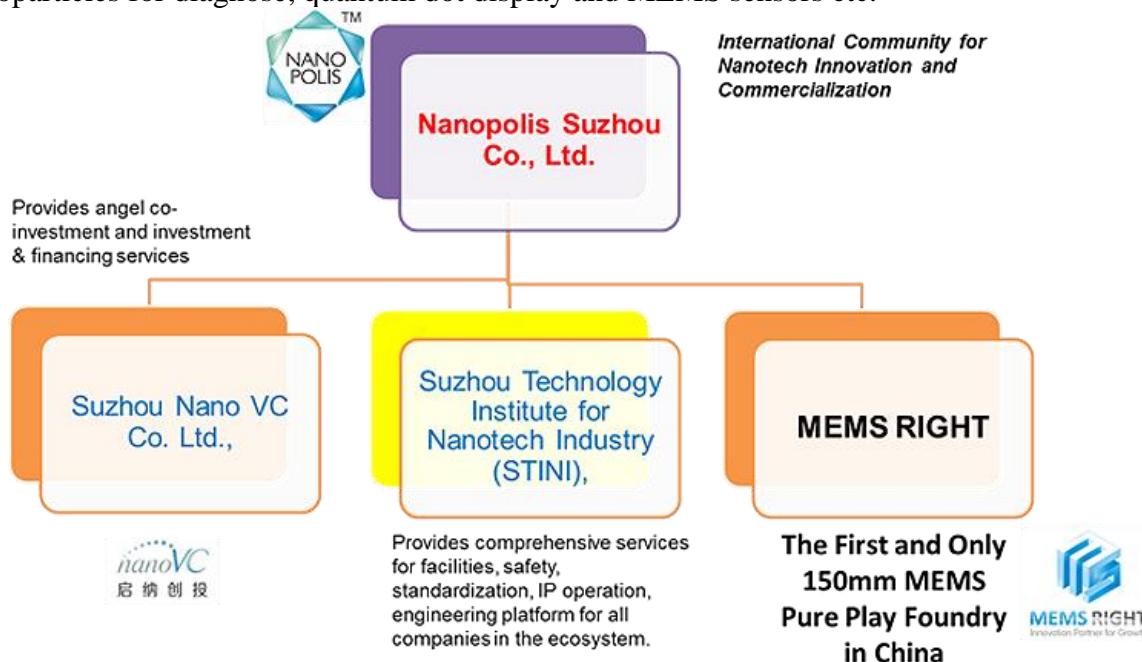
OSCAR Director Professor Zhanfeng Cui is one of the two editors-in-chief of the journal *Bio-Design and Manufacturing*. In the first issue, Professor Cui co-authored an editorial 'Unique Journal: Bio-Design and Manufacturing' with the other chief editor.

In the two-day conference in Hangzhou, academic presentations were given by professors from around the world. For more information about speakers and their introduction please visit: [http://www.bdmconference.org/plenary\\_speakers.html](http://www.bdmconference.org/plenary_speakers.html)



## OSCAR Visits to MEMSRIGHT

On August 21, Dr. Jingsong Huang (Senior Research Scientist in OSCAR), Dr. Weizhi Liu (Executive Assistant to OSCAR Director) and Alex Yang (OSCAR JITRI Fellow) visited MEMSRIGHT in Nanopolis, a governmental platform focusing on MEMS Commercialization and Pilot Production. Mr. Yang Liu gave the OSCAR visitors a tour of Nanopolis and introduced the start-up companies in Nanopolis across diverse areas including nanomaterials, magnetic nanoparticles for diagnose, quantum dot display and MEMS sensors etc.



MEMSRIGHT was founded in 2013 at the Suzhou Industrial Park, focusing on R&D and contract manufacturing of Micro Electrical Mechanical Systems (MEMS). It is a state-owned company under Nanopolis Suzhou, with an investment of over 500 million RMB.

It was built to bridge the commercialisation gap MEMS technologies and meet the needs of MEMS Small Medium Enterprises (SMEs) for their process development and small batch production.

Mr. Shuibo Yu from MEMSRIGHT introduced the equipment and business process to Dr. Jingsong Huang and provided a briefing on the service model and current ongoing projects on Temperature/Gas/Pressure sensors, Microphones and Micromirrors. Questions were raised by Dr. Huang about the equipment and processing capabilities and the possibilities of future cooperation between OSCAR and MEMSRIGHT were discussed.

For more info, please visit their website: <http://en.memsrigh.cn/>.



## Progress of OSCAR's Fit-out and Construction in August

### On-site construction:

All on-site construction companies and trades have entered the OSCAR Building to begin their construction programmes. The pace of fit-out is at full swing. Despite such intensity, on-site management still moves forward orderly.



## Meet OSCAR's New Staff



Binbin Li has joined the Tissue Engineering Group led by Prof Cui in OSCAR as Research Technician. She graduated from Huazhong Agricultural University as graduate student in Veterinary Medicine in 2014. Since graduation, she worked as a desk officer at the Animal Husbandry Bureau of Dangyang City from 2014 to 2016 and a research assistant in the Preventive Veterinary Laboratory of Huazhong Agricultural University in 2016 and 2017. Before joining OSCAR, she serviced for Pfizer as a Safety Data Management Specialist.

Email: Binbin.Li@oxford-oscar.cn



Alan Xu has joined OSCAR as Facility Supervisor of OSCAR (reporting to the Head of Building and Facilities). He is experienced in facility maintenance management work and is a professional in mechanical and electrical related jobs. With more than 10 years of experience in large foreign enterprises, he is familiar with the maintenance of plant facilities, as well as operational maintenance of high and low voltage power distribution, air pressure, air conditioning, process ventilation, fire control system etc. He also has experience in construction management of plant equipment installation and new building construction. He is familiar with relevant laws and regulations in building maintenance, electricity installation, construction acceptance specifications, etc.



Email: Alan.Xu@oxford-oscar.cn



## Neighbours of OSCAR

### **Xi'an Jiaotong University Suzhou School of Nano-Science & Nano-Engineering**

Xi'an Jiaotong University Suzhou School of Nano-Science & Nano-Engineering was established in 2012 by Xi'an Jiaotong University with the support of the Suzhou Industrial Park government.

The aim is to combine Xi'an Jiaotong University's advantage in micro-nanotechnology research with the preferential industrial environment for nanotechnology in SIP. Since establishment, it has formed solid cooperation in scientific research with Suzhou Institute of Nano-Tech and Nanobionics (SINANO, Chinese Academy of Sciences), Nano Science and Technology Institute of University of Science and Technology of China, and College of Nano Science & Technology Soochow University.

It focuses on international cooperation, for example, inviting talented foreign academics as visiting professors for teaching. It also hosts international conferences to exchange ideas and increase international impact. In 2012 and 2013, the second Optofluidics Conference and the China-Austria Nano Technology Forum were held respectively. In 2014, its first foreign students exchange programme kicked off.



To know more, please visit: <http://www.nanoxjtuedu.cn/>





## News Links in August

### Cooperation Projects between China and UK

On August 15, the Consulate General of UK in Shanghai posted an article on its WeChat platform—One More: Research Institutes Jointly Founded between China and UK.

Recently, a new research centre was established by the University of Leicester and Nanjing Iron and Steel United Co., Ltd. The purpose is to apply technologies developed by the University of Leicester to the iron and metal industries.



This is not the first time for China and the UK to cooperate in technology innovation. Many successful centres and projects have been set up. The following are just some examples.

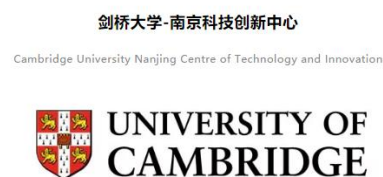
#### Joint Research Centre of Bio-medical Engineering—

This cooperation between University of Birmingham and Southeast University of China is aimed to fully utilize bilateral technological advances to develop products that can improve patients' health conditions.



#### Cambridge University Nanjing Centre of Technology and Innovation—

This centre is cofounded by the University of Cambridge and Nanjing Jiangbei New Area as a multifunctional platform for R&D, technology application, and international academic exchanges, etc.



As the University of Oxford's first overseas research centre in physical and engineering science, Oxford Suzhou Centre for Advanced Research (OSCAR) is also reported in this article of the Consulate General of UK in Shanghai as one more string in the China-UK collaboration bow.

For more info: <https://mp.weixin.qq.com/s/I8KPDtklb06hoj3sRP7WPg>

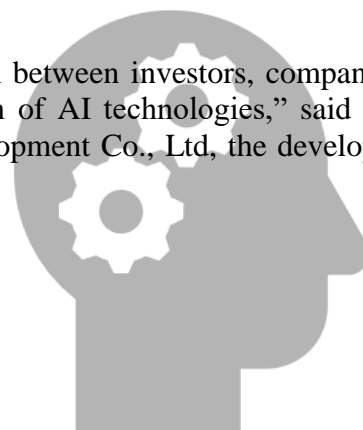
## News Links in August

### SIP AI Industry Park Opens

SIP AI Industry Park (SIP-AIIP), an incubator and cluster of businesses engaged in artificial intelligence development, recently came into operation.

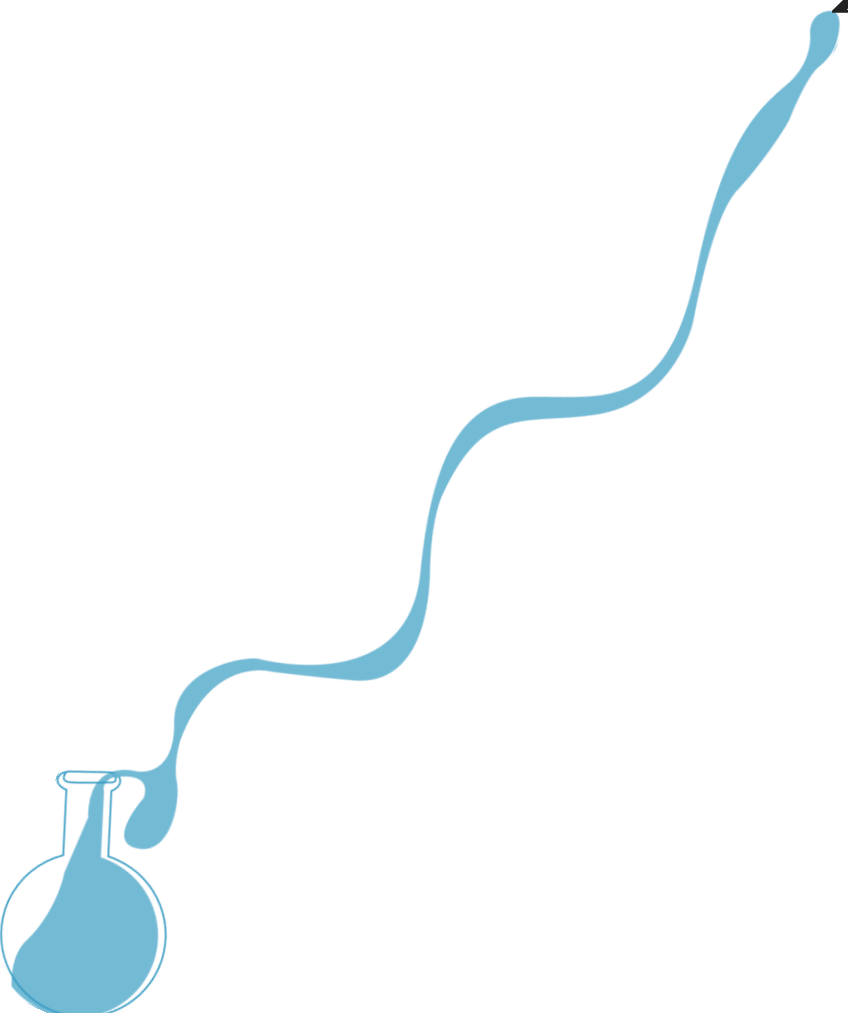
SIP-AIIP currently has 14 buildings, with a total floor area of about 260,000 sqm, and has attracted a number of domestically leading AI research institutes and companies, including Shanghai Institute of Technical Physics of the Chinese Academy of Sciences and IFLYTEK Co., Ltd. that have already set up their offices in some of the buildings.

“We strive to create an ecosystem that facilitates cooperation between investors, companies and research institutes in the development and commercialization of AI technologies,” said Ma Di, deputy general manager of SIP Science & Technology Development Co., Ltd, the developer and operator of the project.





For more info: [www.sipac.gov.cn/english/news/201808/t20180821\\_778008.htm](http://www.sipac.gov.cn/english/news/201808/t20180821_778008.htm)

# GLOBALIZATION





 Building A, 388 Ruoshui Road, Suzhou Industrial Park, Jiangsu, 215123, P.R. China

 0086-512-62869088

 <https://oscar.web.ox.ac.uk/>