UNIVERSITY OF
OSCAR OXFORD

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OSCAR MARKS ITS 4TH ANNIVERSARY with new milestones

OSCAR wins 2022 Greater Suzhou BEST EMPLOYER AWARD

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CONTENTS

OSCAR marks its 4th anniversary with new milestones

OSCAR's fourth anniversary celebration was held on 22nd November.

OSCAR director Professor Zhanfeng Cui, who made his first post-pandemic journey back to OSCAR in early November, was able to attend the event to personally tell the story of OSCAR's development and its success in delivering world-benefiting innovation. He was joined by government leaders from Suzhou Industrial Park (SIP), senior officials of the British Consulate General in Shanghai, and more than 30 representatives from the industrial community. Professor Dame Louise Richardson, Vice-Chancellor of the University of Oxford, and Professor Mark Moloney, OSCAR deputy director, offered congratulations via video messages.

Professor Dame Louise Richardson
Vice-Chancellor of the University of Oxford

The Oxford Suzhou Centre for Advanced Research (OSCAR) is the University of Oxford's first and only engineering and physical sciences research institute located in China. Currently, 15 professors from the University's MPLS Division oversee OSCAR's research portfolio, which now spans modern biotechnology, advanced materials, computational approaches, and manufacturing techniques.

The Centre is a leading exemplar of UK-China science and technology collaboration, born through the joint efforts of the University and Suzhou Industrial Park. The two parties signed the original collaboration agreement in December 2016, and two years later on 22nd November 2018, OSCAR was officially opened. This gives the year 2022 dual significance: it not only represents four years of continuing success, but also the inaugural year of OSCAR's second five-year (2022-2026) development phase, following the signing of a renewed collaboration agreement in 2021.

"'Even with all the restrictions imposed on us since 2020, OSCAR has thrived, demonstrating that it is capable of engaging in excellent science, working with local collaborators and seeking commercial interaction to convert innovation into commercialisation.' said **Professor Moloney** in his video message, 'I'm very sure we'll continually improve this work over the coming years.'"

The celebration also included speeches by OSCAR director Professor Zhanfeng Cui, Acting Consul-General of the British Consulate in Shanghai, Andrew McAllister, and Vice Chairman of SIP Administrative Committee, Qian Ni.

"Speaking at the event, **Professor Cui** said: 'OSCAR has made a strong case for its research excellence and the advantage of international collaboration. The new phase will see OSCAR strive towards 'innovation', launching OSCAR's Innovation Hub to develop innovative technologies and increase technology readiness; 'incubation', speeding up technology spinout to commercialise OSCAR's R&D output; and 'impact', bringing economic, environmental and social benefits to SIP and beyond.'"

"**Andrew McAllister**, British Acting Consul-General Shanghai, said: 'The collaborative relationship between Oxford and Suzhou is a flagship example of international collaboration with mutual benefit. It reflects a wider UK-China, and more specifically UK-Jiangsu, relationship of strength and depth in key, and often cutting edge, fields of activity. OSCAR offers a great example of what we can achieve when we put our collective minds, and will, to it.'"

"**Qian Ni**, Vice Chairman of SIP Administrative Committee, spoke of OSCAR as SIP's flagship project of international collaboration. He said:' In the past four years, OSCAR has exerted the magnetic appeal of a world-leading university and contributed positively to SIP's efforts to introduce advanced commercialisation models, shape an international ecosystem for innovation and enterprise, and connect global technology innovation resources.'"

Several important milestones achieved in 2022 were announced as part of the celebration.

OSCAR signed four industrial collaboration agreements

OSCAR signs agreement for 'large scale production of animal stem cell exosomes project' with Suzhou Rosetta Biotechnology.

Left: OSCAR General Manager, Leah He, right: Ziping Dong, CEO of Suzhou Rosetta Biotechnology.

OSCAR signs agreement for 'treatment of ovarian cancer with novel engineered cell product project' with the Department of Obstetrics & Gynaecology, Frist Affiliated Hospital of Soochow University.

Left: OSCAR Co-PI, Dr. Haiyun Pei, right: Professor Youguo Chen, chief physician and department director

OSCAR signs agreement for 'research on diagnostics of colorectal cancer by combining new generation rapid diagnostics method and the data from surveys' with the Department of Gastroenterology, Frist Affiliated Hospital of Soochow University.

Left: OSCAR Senior Research Scientist, Dr. Hong Chang, right: Dr. Airong Wu, deputy chief physician

OSCAR signs agreement for hosting Ivy Farm Technologies (Suzhou) in OSCAR Technology Accelerator.

Left: OSCAR Head of Research Collaboration, Alex Yang, right: Da Tang, business development consultant of Ivy Farm Technologies (Suzhou).

OSCAR launched a new innovation technology centre for perovskite thin-film technology

A new research facility, the OSCAR-Hongda Innovation Technology Centre (ITC) for Perovskite Thin-Film Technology was officially launched at the event. The ITC is co-founded with Shangqiu Hongda Optoelectronics, a leading manufacturer of high-end functional glass, and is OSCAR's second ITC, following the ITC for Advanced Molecular Diagnostics opened in June last year.

The new facility is dedicated to the development of high-quality perovskite thin-films with a mastery of key technologies for the preparation of large-area devices, advancing the commercial application of perovskite technology in the spheres of solar cells, light-emitting devices, microcavity organic emitters, imaging and others.

The new ITC is led by Professor Paul Stavrinou, Associate Professor of Engineering Science, University of Oxford and Dr. Jinsong Huang, Head of OSCAR's Optoelectronic Technology Lab. Professor Donal Bradley (CBE, FRS, CEng, FIET, FInstP, FRSA) guides the running of the ITC.

Dr. Jinsong Huang (L1), head of the new ITC, Haijun Tian (L2), Chairman of Shangqiu Hongda Optoelectronics, Li Chen (R2), Chairwomen of the Administrative Committee of Suzhou Dushu Lake Science, Education and Innovation Zone, and Andrew MacKenzie (R1), Consul Bilateral - Head of Outreach East China, British Consulate in Shanghai, unveil the ITC's plaque.

OSCAR Innovation Hub opened

OSCAR Director Professor Cui (R2), Chairman of SIP Administrative Committee Xiaoming Lin (L2), Vice Chairman, Qian Ni (L1), and Deputy Director of Suzhou Science and Technology Bureau Wanyong Gu (R1) jointly open the innovation hub

The opening of the OSCAR Innovation Hub represents an important milestone in OSCAR's infrastructure upgrade project, which kicked off in early 2021.

The OSCAR Innovation Hub is located on the seventh floor of the OSCAR building, covering a floor area of around 2,000m^2 and providing over 1,000m^2 in net usable space. It is designed to house multiple Innovation Technology Centres (ITCs) to support OSCAR's goal of creating new channels for the development and commercialisation of innovative, disruptive, and transferable technologies.

The planned ITCs housed within the Innovation Hub will focus on providing technology demonstration, prototyping, and manufacturing for clinical trials, initially in the areas of molecular diagnostics, biomanufacturing, bioprocessing and bioformulation, and environmental biotechnology, increasing technology readiness levels, adapting to specific market niches and moving technologies towards commercialisation.

The anniversary celebration concluded with a cake-cutting ceremony.

OSCAR Open Day connects Chinese and British innovators

As part of its fourth anniversary celebrations, OSCAR opened its doors to peer institutions, investors and industry representatives to showcase cutting-edge technologies and encourage collaboration. Suzhou Industrial Park Business Development Service Centre and the British Consulate General in Shanghai co-hosted the day. OSCAR deputy director Professor Mark Moloney, deputy director of SIP Business Development Service Centre Xiaoqing Wu, and Consul for Science & Technology, British Consulate-General Shanghai Stephen Brennen addressed the event.

In his pre-recorded remarks, Professor Moloney noted the unique position of OSCAR among the many departments of Oxford University. He said: 'We wish to combine the reputation of Oxford University for high-quality advanced research with China's reputation for rapid application and uptake of new technology, especially at large scale in the commercial arena. We actively seek collaboration and commercialization opportunities with local enterprises and institutions to drive the application of these technologies for the wider benefit of society.'

The Open Day featured a roadshow of seven technology projects from OSCAR, highlighting OSCAR's research strengths in nanotechnology and functional materials, biomedical engineering and healthcare, and environment and biotechnology.

OXFORD SUZHOU CENTRE FOR ADVANCED RESEARCH

Technologies presented at the event included, from OSCAR PI Professor Paul Stavrinou's Lab, flexible transparent conductive polymer film technology; from OSCAR PI Professor Mauro Pasta's Lab, single-atom electrocatalysts for water-splitting reaction; from OSCAR PI Professor Luet Wong' Lab, enzyme biocatalyst & biosynthesis of high value complex compounds; from OSCAR deputy director and PI Professor Mark Moloney, surface modification technology platform; from OSCAR-Prenectics ITC, POCT equipment & reagents for animal infectious diseases; from OSCAR PI Professor Wei Huang' Lab, molecular diagnostic & drug-resistant bacteria screening platform; and from OSCAR PI Professor Hua Ye's spin-out company Ivy Farm Technologies, innovative cell culture meat manufacturing.

As well as attracting in-person attendance of more than 40 participants from venture capital firms, government agencies and industry, the event was live-streamed to an online audience of over 300 people.

OSCAR wins 2022 Greater Suzhou Best Employer Award

OSCAR was named the overall winner of the '2022 Greater Suzhou Best Employer Awards', out of 300 applications.

Now in its ninth year, the 'Greater Suzhou Best Employer Awards', directed by human resources and social security authorities, have established itself as Suzhou's most influential employer selection campaign. The awards recognise best practices in human resource management of employers located in Suzhou, and in so doing, they help to showcase great and responsible employers to job seekers.

OSCAR is among 50 recipients of the overall award and the first research institute overall winner in the awards' nine year history.

OSCAR Senior HR Supervisor Miaoqing Shen (left) and OSCAR Media and Comms Supervisor Yanting Li at the award ceremony.

There are a total of 11 award categories, including one overall best employer award and ten special awards spread across the areas of development potential, employee care, popularity with university students, social responsibility, smart manufacturing, employee welfare, HR service, care for women staff, work environment, and staff canteen.

The selection process was informed by both internal and external perspectives. The internal perspective was drawn from an expert review and an employee engagement survey. Twelve experts from government agencies, labour unions, higher-learning institutions, industry, and the media sit on an expert panel to judge the entries against six primary indicators and 19 secondary indicators, covering corporate development, organisational culture,

organisational development, staff relations, remuneration and benefits, and best practices. Externally, the selection was open to public voting and data-driven brand diagnosis for an in-depth and specialised evaluation of applicants' overall performance.

Selection model for Greater Suzhou Best Employee Awards

The expert panel reviews shortlisted entries for the awards

Leah He, general manager of OSCAR, said, 'People are a high priority component of OSCAR's strategic planning. OSCAR puts people first, and we'll create more channels to attract and retain eminent global leaders, research stars and young talents.'

'OSCAR truly deserves to be aspired to.' said OSCAR's senior HR supervisor Miaoqing Shen, 'The idea of 'being people-oriented' is exercised throughout our hiring process. As a human resources professional, I'm the exact practitioner and advocate of that philosophy.'

The award is an endorsement for the excellent work Miaoqing has put in. She joined OSCAR in February 2021, following the success of her second job application to OSCAR. She recalls vividly the Christmas Eve of 2020, when she set foot in the OSCAR building again, four years after she first applied to work at OSCAR. Opportunity crowns those who seek her. At this point, Miaoqing had further developed her career and gained more experience. She said, 'I remember being so happy to receive the employment offer from OSCAR.'

In her role, Miaoqing makes her best efforts to attract, retain and develop people, setting up a platform for free communication among staff and attending to the 'key matters' of employees. Even in the pandemic years, when she was confronted with many 'unprecedented nuts to crack', she was able to resolve every 'key matter' professionally and persistently, including successfully bringing overseas candidates on board.

In Miaoqing's opinion, 'OSCAR distinguishes itself by allowing staff the flexibility to achieve work-life balance. Also, OSCAR encourages its people to grow through hard work. By fostering professional development plans for staff and creating opportunities for young talents to work with the world's top scientists and professional teams, OSCAR sets a clear growth path. This will enable our people to realise their self-worth and 'blossom' in their positions.'

OSCAR Scientists exchange ‘year-in-review’ at Annual Research Work Summary Symposium

On Wednesday 30 November, OSCAR held its Annual Research Work Summary Symposium.

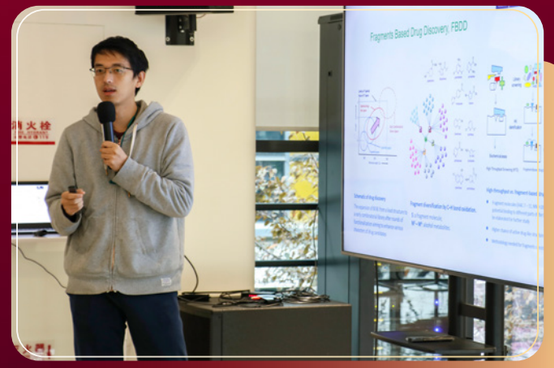
Professor Cui offered comments, suggestions and advice to each presenter and the wider OSCAR research family, who all greatly appreciated his observations and remarks

The symposium consisted of ‘year-in-review’ presentations from representatives in each PI research cluster, presenting their group’s current research work and showcasing their achievements over the past 12 months. In total, there were 11 speakers representing 9 research group clusters. The meeting was attended by all OSCAR research staff, and in-person by OSCAR Director Professor Zhanfeng Cui.

The symposium was chaired by OSCAR research coordinator Dr. Edward Welbeck who moderated the proceedings.

Dr. Jingsong Huang, Optoelectronic Technology Lab

Dr. Chenbo Wang, Energy Storage and Conversion Lab



Dr. Yang Cao, Chemistry Lab

Dr. Ziyue Xiong, Chemistry Lab

Dr. Dandan Wang, Functional Materials Lab

Dr. Xiaosong Liu, Functional Materials Lab

Yu Gao, Environmental and Biotechnology Lab

Dr. Lin Li, Innovation and Technology Centre for Molecular Diagnostics

Dr. Henan Zhan, Regenerative Medical Engineering Research Centre

Dr. Huilin Li, Regenerative Medical Engineering Research Centre

Dr. Alexander Vasilyev, Digital Health Lab

OSCAR Academic Seminar series

On Friday 25 November, OSCAR held its 4th Academic Seminar of the year. The symposium was the 14th international video conference to date, with participants from the UK, Europe, and China in attendance. OSCAR Director Professor Zhanfeng Cui attended the meeting in-person, which concluded events organized for OSCAR's 4th Anniversary week. There were three nominated guest speakers, invited to showcase their expertise and academic achievements. The three speakers were **Dr. Hong Chang**, Senior Research Scientist in the OSCAR-Prenetics Innovation and Technology Centre for Advanced Diagnostics; co-speaker **Dr. Yuan Zhang**, visiting student in Bio-inorganic Chemistry from Professor Luet Wong's research group at the University of Oxford; and co-speaker **Dr. Ziyue Xiong**, Research Scientist with the Chemistry Group led by Professor Jeremy Robertson. In keeping with OSCAR traditions, Deputy Director Professor Mark Moloney officiated over the proceedings.

Talk 1 – "The Quality Management System – Important to Medtech Transfer and Commercialisation"

The transfer of innovations from an academic environment to product development, testing and manufacturing in a corporate environment is affected by numerous barriers, and hence are ventures of high risk. The process from idea to practical clinical application is long and expensive, and the occurrence of a late failure in the development of new products has significant financial consequences. Regulated products including Medtech and healthcare products need quality management systems from their initial R & D stage, not only limited to the latter steps in production. Early planning at the research and design stage using a management tool results in a smoother, less costly transition from development to production.

For this seminar, Dr Chang shared her expertise of working with in-vitro diagnostic devices along with the design and development processes needed to conform to regulatory requirements. Her talk incorporated the concepts of industry-accepted techniques including Good Laboratory Practice (GLP), Good Manufacture Practice (GMP), Quality Management Systems (QMS), and Quality Control (QC). Dr Hong accentuated the importance of what

should be considered "early-on" for a smooth transition in technology transfer to medical product launch, highlighting verification and validation tests, and key documentation required for regulatory purposes.

Talk 2 – "Enantioselective oxidation of unactivated C–H bonds in cyclic amines by iterative docking-guided mutagenesis of $P450_{BM3}$ (CYP102A1)"

The role of cyclic amines as versatile intermediates in drug synthesis and as important fragment molecules in drug discovery is well established. They have found numerous applications across the chemical, agricultural and pharmaceutical industries. The selective functionalisation of cyclic amines remains challenging to achieve via traditional organic synthetic methods. The use of biocatalysts, such as $P450_{BM3}$ enzyme, are exciting alternatives owing to their mild reaction conditions, environmentally-friendly cost, and high reactivity and selectivity.

During the seminar, the co-speakers illustrated a combined substrate and enzyme engineering approach to achieve enantioselective functionalisation of cyclic amines by engineered $P450_{BM3}$ enzymes. In combination with Molecular-Dynamics (MD) simulations and molecular docking, the co-speakers demonstrated the process of enzyme engineering. This synthetic application was exemplified by the total synthesis of anisodamine, a clinical anticholinergic drug.

The work presented by the co-speakers was also recently published in Nature Synthesis. Their work gained additional exposure in the form of a Research Briefing and made the front cover of the December print version, a rare and highly commended achievement from the co-speakers', their collaborators and OSCAR PIs involved.

About the speakers

Before joining OSCAR, **Dr. Chang** was Chief Technology Officer and QA/RA manager at MEStar (Oxford spin-out technology company) and is experienced in obtaining CE/MHRA, ISO13485 application approval and maintaining QMS systems. She was heavily involved in development of the rapid test kit for COVID-19 created by Prof. Zhanfeng Cui, Prof. Wei Huang and their teams. She participated in early lab-based research at Oxford's IBME and was instrumental in demonstrating compliance and seeking regulatory approval. Her contribution helped the test kit, Oxsed RaVid Direct, gain its CE mark in early July 2020.

Dr. Chang completed her doctoral degrees in Materials Science at Queen Mary University of London. She undertook a postdoctoral position in The Institute of Biomedical Engineering (IMBE) at the University of Oxford. Her research there involved fabrication of crosslinked protein membranes in microfluidics channels for use as 3D cell culture.

After completing her postdoctoral research at Oxford, Dr. Chang started developing her career in industry specialising in In-vitro diagnostic medical devices. She has been involved in biomedical product design and development at all stages.

Dr. Yuan Zhang studied Biological Sciences for his undergraduate degree at Nankai University and then attended the University of Oxford to study for his DPhil in Bio-inorganic Chemistry. He was awarded his PhD degree in August this year and is now awaiting his graduation ceremony. His DPhil project was on exploring a combined methodology to engineer a mono-oxygenase, $P450_{BM3}$, for selective production of important drug intermediates.

Dr. Ziyue Xiong obtained her PhD degree in organic synthesis from Queen's University Belfast with Prof. Karl J Hale. Subsequently, she started a postdoctoral fellowship in Prof. Thomas Wirth's group at Cardiff University. At OSCAR, she is working on the applications of C-H hydroxylating enzymes in a variety of synthetic chemistry, in particular, the total synthesis of natural products. Her research interests include enzymatic organic synthesis, organic methodology and natural product synthesis.

Fifth meeting of Oxford-SIP Cooperation and Development Board convenes

The Oxford-SIP Cooperation and Development Board met for its fifth annual meeting on Monday 28 November.

The meeting elected Ms. Li Chen, Deputy Secretary of the SEID CPC Working Committee, and Chair of the SEID Administrative Committee, as a new board member, replacing Mr. Yu Pan, who was recognised at the meeting for his part in OSCAR's development.

Professor Zhanfeng Cui, OSCAR Director and co-chair of the Oxford-SIP Board, updated the Board on OSCAR's research work, commercialisation activity, operations management and future priorities.

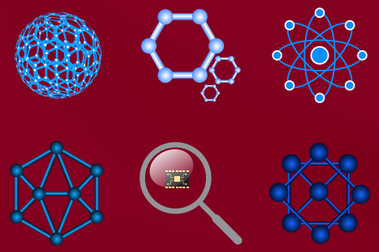
The meeting also included a preliminary discussion on the strategy and pathway for the commercialisation of OSCAR's future research outputs.

SIP thanked the University of Oxford for standing strongly behind the OSCAR project, noting that OSCAR has been productive on all fronts and that SIP would continue to support the project to ensure the solid and successful development of the Centre.

Did you know this about SIP?

Three emerging industries of SIP

-Nano Technology



Nano new materials

Nano photonics

Nano particles

Nano ecological technology

Nano biomedicine

- Over **784** nano-technology related enterprises have been introduced and incubated, creating an output value of RMB **101** billion
- SIP is the only state-level international nanotechnology innovation park in China.

-Machine Learning

- SIP has attracted more than 660 Machine Learning related enterprises, including top global enterprises such as Microsoft, Huawei, GE, Siemens, BOSCH, Philips, Delphi.
- RMB **46 billion** in output value from the Machine Learning sector in 2020.

Company	Country	Focus
Microsoft	USA	Machine learning, natural language processing, neural networks
GE	USA	Intelligent manufacturing, big data analysis
SIEMENS	Germany	Industrial data analysis, industrial 4.0, intelligent transportation
BOSCH	Germany	Intelligent manufacturing, industrial 4.0, autopilot technology, intelligent vehicle networking
DELPHI	USA	Big data analysis, Intelligent manufacturing, intelligent warehouse management system
PHILIPS	the Netherlands	Intelligent medical treatment
HUAWEI	China	Deep learning, language processing
滴滴 流滴一下 美好出行	China	Automatic speech recognition
科大讯飞 IFLYTEK	China	Autopilot technology, big data analysis
思必驰 AISPEECH	China	Automatic speech recognition