



UNIVERSITY OF  
OSCAR OXFORD

NEWSLETTER 030 JANUARY 2020

# 新年 謹賀



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## “ OSCAR in 2019

2019 marked the first full year of operation at OSCAR, the University of Oxford's first overseas centre for physical sciences and engineering research launched in November 2018 in Suzhou, China. The last year has seen OSCAR get off to an encouraging start, with the recruitment of world-class researchers and the launch of internal and external projects. With joint endeavours from OSCAR PIs, researchers and administrative teams, and with firm support from colleagues at the University of Oxford, notable achievements have been accomplished in the last year to support OSCAR's success and longevity. These include:

- ▶ OSCAR PIs and researchers have published 5 papers in various international academic journals.
- ▶ OSCAR has signed 4 MOUs, 3 CDAs and 2 project agreements.
- ▶ Over 20 state-of-the-art laboratories are in daily operation. 85% of the laboratory equipment has been purchased and installed.
- ▶ 5 new PIs from the University of Oxford's Mathematical Institute and the Department of Materials have joined OSCAR to lead research in the new group. The new OSCAR Institute for Mathematical Modelling and Data Analytics will launch in 2020, broadening OSCAR's portfolio of expertise.
- ▶ 21 new researchers (3 senior research scientists, 10 research scientists, 7 research technicians, 1 lab manager) from across the globe were hired in 2019.
- ▶ OSCAR's full-time research team now totals 27 staff, with this number expected to grow further in 2020.
- ▶ 2 external professors, Prof. Lee Ann Laurent-Applegate from Lausanne University Hospital and Prof. Tiantian Zhang from Bournemouth University, have been granted the honorary title of OSCAR Visiting Professor.
- ▶ OSCAR has hosted 2 Oxford students as summer interns in the AI for Healthcare and Optoelectronic Technology groups in conjunction with the University's Careers Service.
- ▶ 2 OSCAR PIs have been awarded a joint grant from the Royal Society (UK) and National Science Foundation of China (NSFC).
- ▶ 4 OSCAR PIs have received Jinji Lake Leading Talent awards.
- ▶ 1 OSCAR researcher, Dr. Yun Wang, has been awarded the Jiangsu Provincial Double Innovation Talent Programme and announced as Research Associate (equal to associate professorship) by Jiangsu Provincial Science and Technology Department.
- ▶ 1 OSCAR researcher, Dr. Jiagsong Huang, has been appointed as Guest Professor by China South University of Technology.
- ▶ 8 OSCAR employees have received district-level salary subsidy.
- ▶ OSCAR PIs and researchers were invited to attend 21 international academic and industry conferences.
- ▶ OSCAR has held 6 invited talks ("OSCAR Thinking" series), 2 OSCAR Open Days, 1 workshop and 1 alumni event.
- ▶ OSCAR has released 77 articles on WeChat and 27 issues of the monthly newsletter, facing to about 3000 followers.
- ▶ OSCAR has received around 60 delegations with over 700 visitors from universities, industries, governments and others to explore the potential collaboration avenues and to share expertise.



# “ OSCAR Annual Work Summary Meeting

On 9<sup>th</sup> January 2020, the OSCAR Annual Work Summary Meeting was held with all OSCAR staff, Deputy Director Prof. Mark Moloney, PIs Prof. Luet Wong and Prof. Jeremy Robertson in attendance. All the research groups and administrative departments reported on progress and achievements made in 2019 and plans for 2020.

The newly appointed Deputy Director, Prof. Mark Moloney, gave opening remarks, reaffirming OSCAR's motivation as the youngest member of the University of Oxford and encouraging OSCAR researchers to pursue the spirit of CRISP (creativity, reproducibility, initiative, standards and productivity) when striving for scientific excellence and industrial application.

General Manager Leah He summarised OSCAR's accomplishments made across the board during 2019, highlighting the rapid expansion of OSCAR's research teams and celebrating the remarkable progression in lab establishment which heralded promising start to research in the first full year of operation.

Senior Research Scientist Dr. Hui Wang, from the Regenerative Medical Engineering group, presented the year's research progress and outputs. The group focussed on the effects of different culture medium on cells and the effects of different silk fibroin structures on stem cells. The work involved detailed modelling and analysis and included many novel aspects, applicable in many areas of *in vitro* tissue engineering research. Led by Profs. Zhanfeng Cui and Hua Ye, the group has published 3 papers, signed 2 MOUs and been awarded 1 joint grant in 2019.

Dr. Yang Yang, Senior Research Associate in Prof. David Clifton's AI for Healthcare group, shared their work on non-intrusive fetal-ECG based abnormality detection and unobtrusive sleep monitoring and cardiovascular measurements with smart mattress. She then introduced their collaborations with local hospitals, research institutes and industry partners in Suzhou, Shanghai and Wuhan, etc. The group signed 1 MOU and 2 CDAs in 2019.

Dr. Yun Wang, Senior Research Scientist in Profs. Ian Thompson and Wei Huang's Environmental and Synthetic Biology group, reported on their ongoing projects on metal working fluid, single cell Raman and biosensor testing. These projects are run in cooperation with the Institute of Soil Science, the National Institute for Laboratory and Inspection Body, Jiangsu Hengshun Vinegar Co., Ltd and Nanjing Kerun Lubricants Co., Ltd. 1 MOU, 1 CDA and 2 Agreements have been signed between the group and their collaborators in the past year.

Dr. Yang Cao, Research Scientist in Prof. Luet Wong's C-H Activation for Drug Discovery and Synthesis group, was involved in the design of OSCAR's laboratories from the early stages. He presented the considerations that went into designing the state-of-the-art laboratories, the procurement and installation of laboratory equipment and subsequent layout modification of laboratory areas and set-up of experiment flow to create a truly bespoke research environment. He then reviewed the group's work to establish a gene library, and briefed research activities concentrated on C-H bond activation for fragment diversification and terpene metabolic engineering in *E. coli* & yeast.

Research Scientists Dr. Dandan Wang and Dr. M. Kamran Khan in Prof. Mark Moloney's Surface Science group each presented their research and year's achievements of polymer functionalization using diaryl carbene, green surface functionalisation, green antibacterial surfaces and facile and green enzyme immobilisation, along with a review of laboratory establishment. The research work has myriad industrial applications and creates a strong platform for future work and collaborative projects.



Prof. Mark Moloney,  
Deputy Director of OSCAR



Leah He, General Manager of OSCAR



Dr. Yun Wang, Senior Research Scientist,  
Profs. Ian Thompson and Wei Huang's group



Dr. Yang Cao, Research Scientist,  
Prof. Luet Wong's group



Dr. Hui Wang, Senior Research Scientist,  
Profs. Zhanfeng Cui and Hua Ye's Group



Dr. Yang Yang, Senior Research Associate,  
Prof. David Clifton's group



Dr. Dandan Wang, Research Scientist,  
Prof. Mark Moloney's group



Dr. M. Kamran Khan, Research Scientist,  
Prof. Mark Moloney's group

# “ OSCAR Annual Work Summary Meeting

On behalf of the Optoelectronic Technology group, Senior Research Scientist Dr. Jingsong Huang summarised the group's research performance including 3 internal projects, 8 joint research projects, 4 grants applications, 1 patent application and progress in laboratory establishment in 2019 under the supervision of Profs. Donal Bradley and Paul Stavrinou. The establishment of cutting-edge cleanrooms and printing equipment will enable high-quality research and manufacturing.

Research Technician Enqi Chen briefed attendees on the group's work including conference presentations, laboratory modification and equipment procurement led by Profs. Mauro Pasta and Jamie Warner. He also introduced the reformed group's research directions in energy storage and conversion. Following Prof. Mauro Pasta's appointment in November 2019, the group will see the appointment of new researchers in 2020.

Industrial Cooperation Manager Alex Yang presented a summary of the progress made across 20 collaborative projects and the status of 14 research grant applications. He also introduced several grants funded by Jiangsu Industrial Technology Research Institute (JITRI).

Head of Building Services and Facilities Frank Zhang reviewed the department's yearly performance with a focus on building maintenance, EHS and ICT, highlighting that OSCAR was awarded the Outstanding Organisation Award in Safety by Suzhou Dushu Lake Science and Education Innovation District (SEID) in 2019.

Office Manager Steven Chen outlined the department's annual work on administration and HR by showing pictures and statistics, such as 2436 workflows completed in OA, 3017 registered visitors, 10 R-visas for PIs, 11 work and residence permits for non-Chinese employees, etc.

Finance Manager Tracy Chen reported on the department's supports for OSCAR's operations in treasury, accounting, budget and forecast, tax, insurance, etc. Each of OSCAR's new staff members was trained in financial operations following appointment.

At the end of the meeting, OSCAR new recruits, Catriona Inverarity, Executive Assistant to the Director and Senior Research Manager, and Dr. Ziyue Xiong, Research Scientist in Prof. Jeremy Robertson's group, shared their academic background, research interests and work plans in OSCAR.



Dr. Jingsong Huang, Senior Research Scientist, Profs. Donal Bradley and Paul Stavrinou's group



Enqi Chen, Research Technician, Prof. Mauro Pasta's group



Alex Yang, Industrial Cooperation Manager



Frank Zhang, Head of Building Services and Facilities



Steven Chen, Office Manager



Tracy Chen, Finance Manager



Catriona Inverarity, Executive Assistant to the Director and Senior Research Manager



Dr. Ziyue Xiong, Research Scientist, Prof. Jeremy Robertson's group

## “ PI Activities

In early January, PIs Prof. Mark Moloney, Prof. Luet Wong, Prof. Jeremy Robertson and Prof. David Clifton were at OSCAR to review research progress, meet with potential collaborators and oversee progress with lab furnishing.

Prof. Mark Moloney held a meeting with Prof. Hongting Pu from the Institute of Functional Polymers, School of Materials Science and Engineering, Tongji University, Shanghai, to discuss potential collaborations on 10<sup>th</sup> January.

On 13<sup>th</sup> January, Prof. David Clifton held a meeting with group members and interviewed prospective candidates for the role of Research Scientist in AI for Healthcare.



## “ Meet OSCAR's Researchers Interview with Dr. Yang Cao

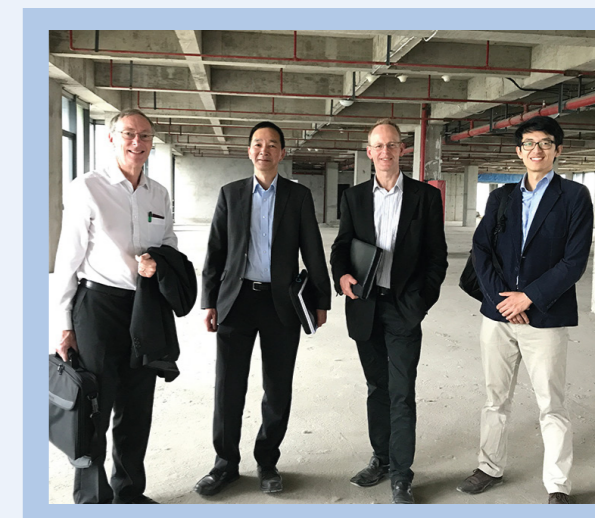


Dr. Yang Cao received his BSc in Biological Technology from Beijing University of Chemical Technology in 2011. After 2 years as a visiting student in the Institute of Genetics and Development Biology, Chinese Academy of Science, in 2019 he completed his DPhil in Inorganic Chemistry from the University of Oxford under the supervision of Prof. Luet Wong. He currently works as a Research Scientist in Prof. Luet Wong's group at OSCAR.

Since joining Prof. Luet Wong's group in 2012, Dr. Cao has focused on the directed mutagenesis of the monooxygenase P450BM3 from *Bacillus megaterium* in order to expand the substrate scope and manipulate the reaction selectivity. During his DPhil, his main research interests were the oxidation of terpene and terpenoid, which belong to a large class of natural products with structure complexity and diversity of medical and biological functions; and the activation of such classes of natural compound to generate an extensive compounds library for the further

application via synthetic chemistry. In 2014, Dr. Cao joined Prof. Luet Wong's spin-out company, Oxford Biotrans, as a researcher working to synthesise a natural flavour and fragrance compound, nootkatone, via P450BM3 mediated biotransformation reaction. This project was completed and successfully scaled up to industrial production level, and the first batch of products has been launched to the market.

From 2017 Dr. Cao started to work closely with the OSCAR team in its early stages to establish three research groups and laboratories supervised by Prof. Mark Moloney, Prof. Luet Wong and Prof. Jeremy Robertson from the Department of Chemistry. After one and a half years' efforts devoted to laboratory design, equipment procurement and installation, purchase of experimental consumables and chemicals and establishment of workflow and safety regulations, the Oxford chemistry branch is now ready to operate with advanced research capacity.



## Q: What prompted you to make the decision to join OSCAR here in Suzhou?

I knew quite early on that the University of Oxford planned to establish OSCAR. In 2017, Prof. Mark Moloney, Prof. Luet Wong and Prof. Jeremy Robertson from the Department of Chemistry were appointed by the University as the first wave of PIs to set up research groups at OSCAR.

As a member of Prof. Luet Wong's group, I started to engage in the establishment of the three research groups in late 2017, and officially joined OSCAR in July 2018. The University's rigorous and serious attitudes towards OSCAR as well as the Suzhou Municipal People's Government's abundant support makes me believe that OSCAR will provide an engrossing and pragmatic environment for research. What attracts me most is OSCAR's state-of-the-art laboratories and sufficient research support, benefitting from the University's world-leading experience of scientific research and the solid support from local government.

## Q: What is your research project and how is it progressing?

As a Research Scientist in Synthetic Biology in Prof. Luet Wong's group, I am carrying on the research on biosynthesis and oxidation of natural products to make novel compound library for drug discovery via combined biocatalytic and synthetic chemistry methods. Previously, 350 P450BM3 monooxygenase variants genes, which were accumulated after years of research in Oxford, were transferred from the University to OSCAR for further



research. We are currently working on regenerating our monooxygenases variants library for biocatalysis via expressing these 350 genes to build the foundation of our future research.

Furthermore, we are also developing a biosynthesis system of terpenoids, which requires the selection and procurement of various genes and expressing plasmid from different suppliers and non-profit plasmid repository, etc. The negotiation on the imports and exports of biological products is underway, while we have already started the construction and initial detection of existing genes and plasmids in our laboratory.

## Q: What are your short-term and long-term research plan and aims at OSCAR?

Since the complexities of analytical instruments and laboratory design and furnishing, the construction of laboratories was substantially completed before the Chinese New Year of 2019. Thus, my research work has just started in the last few months. My short-term research plan is to establish the mutant library of P450BM3

monooxygenase and the biosynthesis system. In the long run, our research group aims to develop a biosynthetic system for the generation of the oxidised natural products from glucose molecules with every possible site been activated via combined biocatalytic and synthetic chemistry methods. Moreover, in close collaboration with Prof. Jeremy Robertson's group, we will utilise the P450 mutant library and synthetic chemistry methods to make novel compounds for drug discovery.

## Q: How is your life at OSCAR and in Suzhou?

Before joining OSCAR and settling in Suzhou in July 2018, I had visited Suzhou several times in preparation for the foundation of OSCAR. Suzhou impressed me a lot as a historical city with rich cultural heritage. The planning and design of the Suzhou Industrial Park is highly advanced, and its development is remarkable. My wife and I had our first baby here, and we are both enjoying our peaceful and comfortable life in Suzhou.



## OSCAR's New Researcher

### Ziyue Xiong

Research Scientist

Prof. Jeremy Robertson's group



Dr. Ziyue Xiong joined OSCAR as a Research Scientist in Organic Synthesis in January 2020. She obtained her PhD degree from Queen's University Belfast (UK, 2017). Subsequently, she worked as a postdoctoral fellow at Cardiff University (UK, 2017-2020).

At OSCAR, Dr. Ziyue Xiong is working on the applications of C-H hydroxylating enzymes in a variety of synthetic chemistry, especially, the total synthesis of natural products. Her research interests include enzymatic organic synthesis, natural products synthesis, and organic electrochemistry.

## “ Ongoing Collaborations



On 3<sup>rd</sup> January, Dr. Changliang Liu, Director of the Strategic Operations Department of Nanjing Iron and Steel Co., Ltd. (NISCO), and Jane Lu of British Consulate-General Shanghai visited OSCAR to discuss the future collaboration with OSCAR and the University of Oxford in metal materials area. NISCO established the NISCO UK Research Centre at the University of Leicester in 2018.



On 3<sup>rd</sup> January, a delegation from Shandong Research Institute of Industrial Technology visited OSCAR to understand research interests and discuss potential cooperation with OSCAR.



On 8<sup>th</sup> January, researchers from OSCAR's AI for Healthcare group (Dr. Yang Yang and Dr. Jun Qi) visited Suzhou Medical System Company to discuss the potential collaboration in Clinical AI. The Company is a listed company that provides total solution in the field of clinical informatics and digital hospital.

On 10<sup>th</sup> January, SIP government officials visited OSCAR to learn about OSCAR's progress in 2019 and plans in 2020.

On 13<sup>th</sup> January, Mr. Yong Duan, Chairman of Suzhou Sujinyuan Biotechnology, visited OSCAR to discuss collaborative opportunity with the Environmental and Synthetic Biology group. The company has a patented bacterial strain which can degrade 99% of food waste within 24 hours.

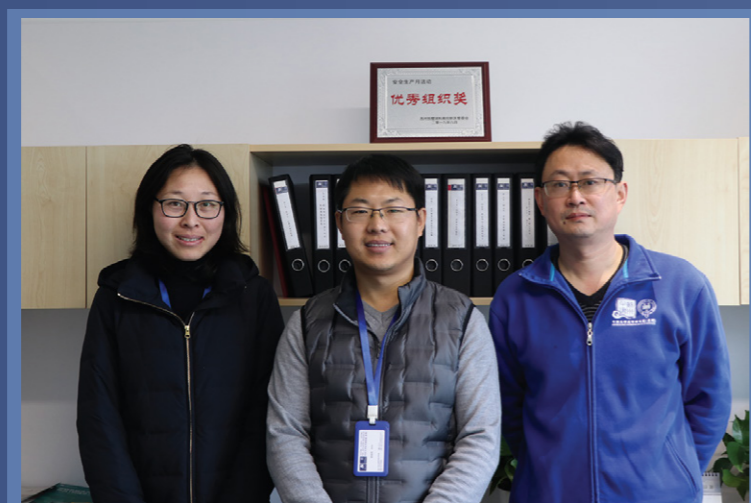
On 14<sup>th</sup> January, Southeast University visited OSCAR and had a meeting with researchers from the AI for Healthcare group (Dr. Yang Yang and Dr. Jun Qi) to discuss the potential collaboration on diagnosis of Parkinson's disease through AI algorithms.

## “ EHS Management in OSCAR Recognised

In accordance with regulatory requirements in China and relevant policies of the University of Oxford, OSCAR has established the EHS (Environment Health Safety) system. This includes fire prevention, chemical safety, biosafety, laser safety, emergency response, EHS inspection, construction management, change management, electrical safety, staff training, personal protective equipment, special equipment, waste water, waste gas, hazardous waste and occupational health, to better improve the management of OSCAR laboratories and support the operation of OSCAR building.

Reporting to Head of Building Services and Facilities, EHS Supervisor Mary Ma joined OSCAR in January 2019 and has been promoting the establishment of EHS system ever since. In April 2019, Mary received training at the University of Oxford in the University's safety and health policies and standard practices. In June 2019, OSCAR participated in a campaign for National Safety Month launched by Suzhou Dushu Lake Science and Education Innovation District (SEID) and was awarded the Outstanding Organisation Award in Safety. In November 2019, Mary made a presentation to showcase OSCAR's progress in laboratory safety management at a forum on laboratory safety organised by SEID. 3 internal EHS trainings have been arranged for OSCAR staff in 2019.

On 16<sup>th</sup> January 2020, a health and safety audit of the OSCAR building was conducted by a group of government officials from SEID. Led by Mr. Yan Shen, Deputy Director of SEID Administrative Committee, the officials undertook a thorough inspection of all OSCAR laboratories, with particular focus on storage of reagents; management of flammable, explosive and precursor chemicals in chemistry laboratories on 8F; and hazardous waste disposal. OSCAR won positive recognition from local authorities after the audit and was highly praised for its practices, and protocols. OSCAR's EHS system is being held up as an example to other local research institutes and universities.



OSCAR building services and facilities team

💡 Just a short note to report, all OSCAR employees are safe from the COVID-19 break.

Since the outbreak and subsequent of COVID-19 throughout China during January 2020, OSCAR administrative team responded promptly to check every OSCAR and onsite third-party staff's whereabouts and travel history, distributed KN95 masks to staffs in need and ordered disinfectants and protective supplies (e.g. medical masks, hand sanitizers, alcohol wipes). These measures, meeting and exceeding local guidance, were intended to safeguard OSCAR staff and minimise disruption. During the Chinese New Year Holiday, the administrative team also kept constant contact with staff by WeChat and email, including sharing official notices and prevention guidance, collecting travel plans and monitoring health status. Particular effort was made to share translated updates with overseas staff in English.



OSCAR was awarded the Outstanding Organisation Award in Safety by SEID in June 2019



EHS Supervisor Mary Ma made a presentation at a forum on laboratory safety management in November 2019



## “ SIP News for January

### SIP resolves on further opening-up

Suzhou government held the Conference on Further Opening-up in Suzhou on 3 January, releasing 30 policy decisions and 68.8 square kilometres of industrial plots available to global investors in the hope of promoting further opening-up. As a pacesetter in Suzhou's opening-up, SIP is ready to continue its leading role in the new-round of opening-up.

The Infographic Guide to Investment in Suzhou released at the conference includes 14 industrial clusters in SIP, which boast integrated industrial ecosystems for enterprises engaged in the fields of biomedicine, new-generation information technology and modern services, etc. SIP authorities are enhancing efforts to foster an excellent business environment at the free-trade zone established in the area last September, and strengthen policy and financial support for project and talent introduction. This obviously provides good opportunities for investors.

Many investors have already started their deployment in SIP. At the conference, Danaher, a Washington-headquartered science and technology innovator, and a number of Fortune 500 enterprises, research institutes, foreign banks and professional service organisations signed agreements to launch a total of 58 projects in SIP.

Moreover, SIP announced at the event to offer 3.9 square kilometres of industrial plots for global investors and seek partners for a list of projects.

7<sup>th</sup> January 2020

[http://www.sipac.gov.cn/english/news/202001/t20200107\\_1087823.htm](http://www.sipac.gov.cn/english/news/202001/t20200107_1087823.htm)



### SIP tops the ranking of National Economic and Technological Development Zones

The Ministry of Commerce of the People's Republic of China on 17<sup>th</sup> January released the results of its latest evaluation of the country's National Economic and Technological Development Zones (NETDZs). SIP retains for the fourth straight year the top spot in the comprehensive evaluation and by the single criterion on foreign trade, and ranks among the top 10 in terms of utilization of foreign investment.

It is reported that the comprehensive evaluation took into consideration industrial foundation, science and technology innovation outcomes, regional influence, performance in environmental protection and administrative services. SIP took a leading position in all the five indexes.

The achievements partly stem from SIP's endeavour over the past year in encouraging and helping local enterprises seek business opportunities in overseas markets as well as offering lofty incentives to attract foreign investment. Besides, they should be partly attributed to SIP's consistent efforts to propel economic restructuring and institutional reform.

The following figures show SIP's outcomes in driving open economy:

SIP attracted 422 more foreign investment projects in 2019, with a total registered capital of US\$ 1.58 billion.

Among all the new projects, those in strategic emerging industries account for about 70%. SIP's preferential policies last year helped reduce taxes on foreign-funded enterprises by RMB 6.81 billion, and made nearly 10 billion of subsidies and rewards available to the enterprises.

SIP authorities disclosed this year's development plan which lays emphasis on the construction of the China (Jiangsu) Pilot Free Trade Zone Suzhou Area established in SIP last September, talent and project introduction and institutional reform to maintain SIP's leading role among the NETDZs.

17<sup>th</sup> January 2020

[http://www.sipac.gov.cn/english/news/202001/t20200117\\_1090130.htm](http://www.sipac.gov.cn/english/news/202001/t20200117_1090130.htm)

# 2020 Spring Festival

