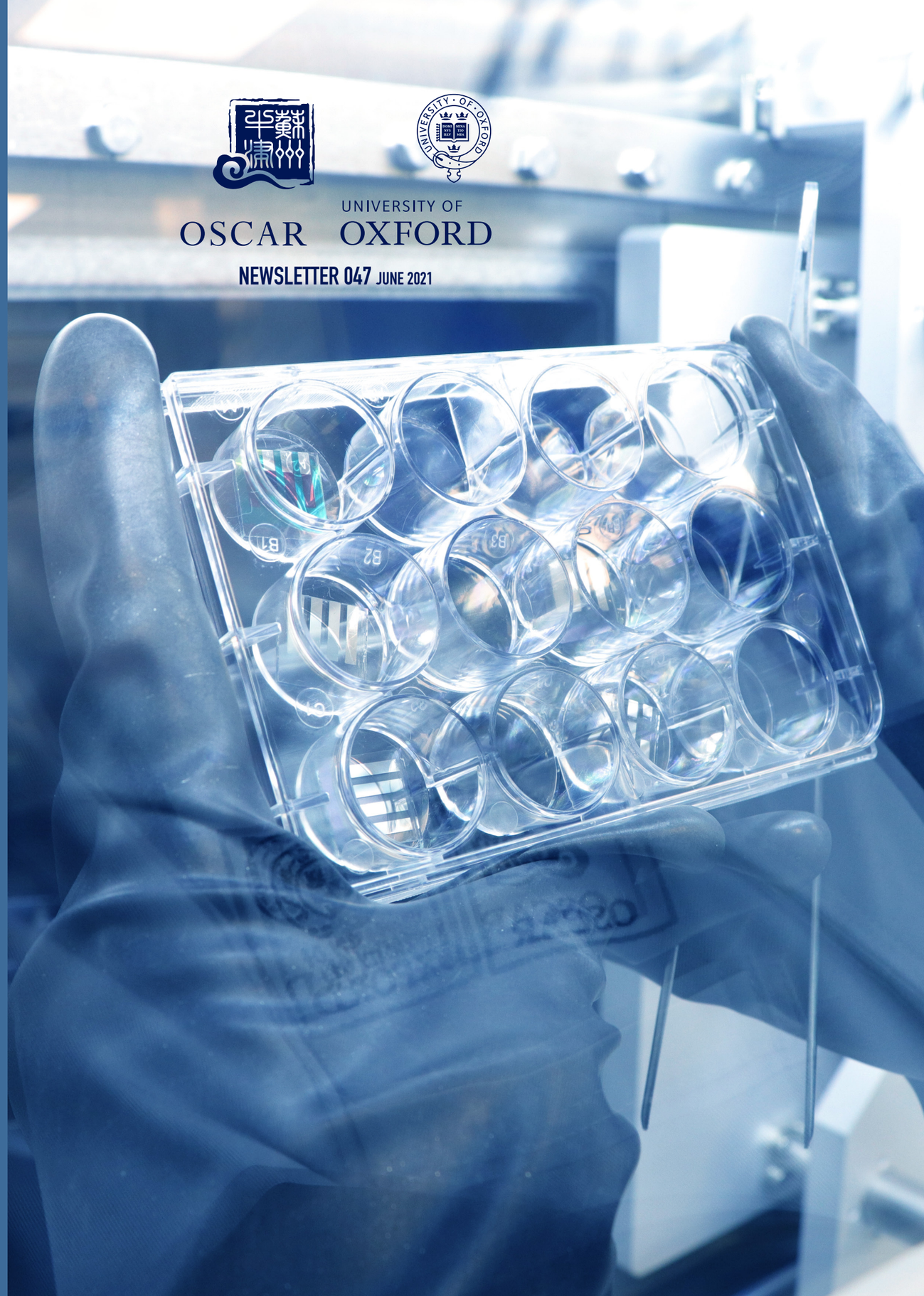
Contact us
Address: Building A, 388 Ruoshui Road, Suzhou Industrial Park, Jiangsu, P.R. China, 215123
Tel：0086-512-62869088
Email：info@oxford-oscar.cn
Website：https://oscar.web.ox.ac.uk/

联系我们
地址：中国江苏省苏州工业园区若水路388号A幢（215123）
电话：0086-512-62869088
电邮：info@oxford-oscar.cn
官网：https://oscar.web.ox.ac.uk/
微信公众号：牛津大学高等研究院（苏州）

WeChat / 微信公众号

UNIVERSITY OF
OSCAR OXFORD

# NEWSLETTER 047 JUNE 2021



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# UK Ambassador inaugurates OSCAR-Prenetics Innovation and Technology Centre for Advanced Molecular Diagnostics

The Oxford-Suzhou Centre for Advanced Research, has marked another significant milestone with the launch of **OSCAR-Prenetics Innovation and Technology Centre for Advanced Molecular Diagnostics (the OSCAR-Prenetics ITC)**.

The facility is the result of a landmark multi-million-pound collaboration between the University of Oxford, OSCAR and Prenetics Limited, a global leader in the field of diagnostics and genetic testing.

Together, they intend to develop affordable, decentralized and point-of-care tests for infectious diseases threatening global health, including Covid-19.

In early 2020 OSCAR played a leading role in the development of OxLAMP, a novel rapid testing technology for SARS-CoV-2 (COVID-19), as part of a team led by Professor Zhanfeng Cui FREng and Professor Wei Huang from Oxford's Department of Engineering Science. The test is now in use at Heathrow and other major UK and international airports; Oxsed, the company spun out to support production of the OxLAMP tests, was quickly acquired by Prenetics. The new OSCAR-Prenetics ITC is a direct result of this successful acquisition and commercialization, and will bring together leading researchers in bio-sensing, clinical virology, microbiology and medical devices.

The OSCAR-Prenetics ITC facility was launched with a ceremony attended by Her Majesty's Ambassador to China, Dame Caroline Wilson DCMG, and joined on line, from the University of Oxford: Professor Louise Richardson, Vice-Chancellor, Professor Patrick Grant, Pro-Vice Chancellor Research, and Professor Sam Howison, Head of the Mathematical, Physical and Life Sciences Division. Other on-line attendees included Ms Amanda Solloway, Parliamentary Under Secretary of State for Science, Research and Innovation, and Professor Christopher Smith, UK Research and Innovation International Champion. Representatives from Suzhou Industrial Park attended the ceremony too. The ceremony was chaired by Prof Zhanfeng Cui.

Professor Louise Richardson, Vice-Chancellor of Oxford University, welcomed the attendees and said: 'OSCAR-Prenetics ITC fits firmly into Oxford's tradition of international partnerships and collaboration with industry. We see the results in the development of the OxLAMP rapid test for COVID-19 which began as a joint effort between the Oxford team and OSCAR. OSCAR will build on this success with the development of ITCs,Innovation Technology Centres, to create new channels for innovations and transferable technologies.'

Minister Soloway congratulated the opening of the ITC and emphasized the importance of UK- China collaborations in science to provide solutions to global issues such as pandemic prevention and environmental change.

The Ambassador said: "The collaborative partnership between Oxford and OSCAR is not only beneficial to both parties concerned, but also to the whole world…I can reassure you that things are going from strength to strength at this wonderful centre. I'm sure the centre we're marking today will also be a great success."

Commenting on how UK-China cooperation has positively contributed to international innovation, Professor Christopher Smith of UK Research and Innovation said: 'The development of the Oxford rapid COVID-19 tests, which are now in

widespread use, is a key example of the success that comes from UK-China cooperation and highlights the need for long term sustainable partnerships, because when we are able to invest for the long term, we generate significant outcomes for the benefit of both sides.'

*OSCAR Website*

*WeChat*

*linkedin.com/company/oxford-oscar*

As it gathers momentum for its second phase of development, OSCAR will devote much of its efforts to creating new channels for innovative, disruptive and transferable technologies. One way in which this will be achieved is via the formation of Innovation Technology Centres ( "ITCs" ). These centres will accelerate the technology readiness level (TRL) of OSCAR research, and promote direct industrial involvement and collaboration. OSCAR's proximity to a large manufacturing base and wide variety of end users within the Suzhou Industrial Park was a primary driver for the University of Oxford opening the facility.

# Oxford University spin-out, Ivy Farm, to establish presence at OSCAR

Ivy Farm Technologies ( “Ivy Farm” ), an Oxford University spin-out developing promising technologies for the production of cultured meat, will establish a permanent presence within the OSCAR Technology Accelerator (OTA) to explore the China market and commercial opportunities. The company has revealed plans to become the first commercial producer of sustainable, cultured meat[1] for supermarkets and restaurants in the UK by 2023.

*Product of Ivy Farm*

## Cultured meat - “food industry of the future”

Ivy Farm was co-founded in 2019 by Professor Cathy Ye and Dr Russ Tucker, who met at Oxford University. Cathy Ye is Associate Professor from Oxford University in the Institute of Biomedical Engineering. At OSCAR, she is one of the PIs leading research in regenerative medical engineering. Russ Tucker holds a PhD in Biomedical Engineering from Oxford University and was previously a commercial and strategic advisor to supermarkets.

Ivy Farm’s non-GMO production process uses technology developed at Oxford University, developed in the same building that produced the Oxford-AstraZeneca Covid-19 vaccine. The company believes its technology is a game changer because of its unique cell growth ‘scaffold’ system which means that it is comparatively low cost and has the potential to be applied at scale. Ivy Farm sees huge opportunity for cultured meat in China, and its presence at OSCAR will help boost meaningful collaboration with local partners to stimulate further innovation in this area, supporting the development of the “food industry of the future” .





## Cultured meat to bring tangible benefits to the planet

*Ivy Farm Co-founder, Prof. Cathy Ye*

*“The manufacturing process used by Ivy Farm adopts advanced tissue engineering techniques. By taking a small number of healthy cells from an animal, placing them in a bioreactor and exposing them to a perfect mix of vitamins and nutrients, we can replicate and produce great tasting meat in as little as three-to-four weeks,” said Cathy Ye, Ivy Farm co-founder. “The environmental and societal benefits of this process are numerous, including contributions to food safety and food security, and China stands to be a huge beneficiary in the years to come. We look forward to working with OSCAR to promote the growth of cultured meat in China and globally.”*

The meat and dairy industry is estimated to account for 18 per cent of all greenhouse gas emissions – greater than all the world’s transportation systems combined. Yet demand for meat is predicted to rise by another 70 per cent as the world population grows to almost 10 billion by 2050 – placing an unsustainable burden on the environment[2] . Meeting the demand through traditional meat production would drastically accelerate deforestation. Ivy Farm believes cultured meat, which serves 8 of the UN’s sustainable development goals, is the answer given it is high quality, slaughter-free and comes with a significantly lower carbon footprint[3] . China has pledged to be carbon neutral by 2060 and cultured meat can contribute to the realization of this goal by reducing emissions in the food supply chain.

*Ivy Farm Co-founder, Dr. Russ Tucker*

*“If you look at the world around us, the way we currently produce and consume food is unsustainable. Already nearly half the worldwide harvest is required to feed livestock and that’s only going to go up. Cultured meat is the silver bullet – through cutting edge technology we can provide real, high-quality meat while saving the planet. Ivy Farm will be great for the environment and great for meat lovers, with the added benefit of avoiding antibiotics, growth hormones and bacterial contamination which are often associated with traditional farming techniques,” said Russ Tucker, Ivy Farm co-founder.*

## OSCAR Technology Accelerator

The OSCAR Technology Accelerator (OTA) is an inhouse incubator for OSCAR's own spinouts and a soft-landing site for spinouts of Oxford University in the UK. The OTA is sited on the second floor of the OSCAR building and covers an area of 20,000 $m^2$. Ivy Farm is the third company to have established a presence in OTA, after Oxford University Innovation and Oxford MEStar.

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*[1]Also has been referred to as cellular meat, cultivated meat and lab-grown meat.*

*[2]The UN Department of Economic and Social Affairs is predicting a rise in global population from 7.5 billion to close to 10 billion by 2050 and a rising middle class in Asia that are hungry for meat then demand for meat is expected to increase +70%.*

*[3]**Carbon footprint of cultured versus farmed meat**: https://cedelft.eu/wp-content/uploads/sites/2/2021/04/CE_Delft_190107_LCA_of_cultivated_meat_Def.pdf*





# OSCAR Academic Seminar Series: Low-Cost, Mobile Phone Enabled Infectious Disease Diagnosis in Remote, Under-served Communities

The 8th OSCAR Academic Seminar was convened on Friday 24th June, with a guest lecture from OSCAR Visiting Academician Professor Jonathan Cooper. Entitled "Low-Cost, Mobile Phone Enabled Infectious Disease Diagnosis in Remote, Under-served Communities", the lecture focused on the research work of Prof. Cooper and his team in the remote and under-served communities in East Africa, to provide the local people with promising, low cost, mobile phone enabled diagnostic technology for malaria and schistosomiasis.

Infectious diseases are the leading cause of death and morbidity of people living in poverty, carrying profound economic and social impacts. One challenge in providing effective interventions within remote, under-served communities in the Global South is that once testing has been completed, results often need to be communicated to healthcare professionals, in order to implement care pathways.

To achieve this, Prof. Cooper and his team has demonstrated an easy-to-use, end-to-end Internet-of-Things platform for multiplexed nucleic acid infectious disease diagnosis, as a digital health platform. A mobile-phone controls the DNA test processing and reads and analyses the results provided on a low-cost, simple lateral-flow microfluidic paper cartridge. The system is implemented on and controlled by an Android app with blockchain secured healthcare data management to provide secure data connectivity and an edge AI decision-support tool based upon deep learning.

The technology was validated in the field in rural East Africa, for the diagnosis and treatment of malaria and schistosomiasis - reducing the need for expert human intervention by providing confidence in the interpretation of the results. The system, which meets The World Health Organisation ASSURED characteristics, also opens up the possibility of integration of secure geotagged diagnostic information within surveillance databases.

**Professor Jonathan Cooper** FREng, FRSE

Professor Cooper holds The Wolfson Chair of Bioengineering at the University of Glasgow. He has interests in medical imaging, medical diagnostics and medical devices. He has worked extensively in Eastern Africa on infectious diseases diagnostics in rural communities in Rwanda, Uganda, Malawi and Tanzania.

He has published over 300 papers, with an ISI H index of 54 (excluding reviews), including Nature Comm, Nature Electronics, PNAS, Nanoletters, ACS Nano, for example. He holds Visiting Professorships at The University of Oxford and OSCAR, China, and The School of Medical Science and Technology, IIT Kharagpur, India. He was elected as a Fellow of the Royal Academy of Engineering (UK's National Academy of Engineering) as well as a Fellow of the Royal Society of Edinburgh (Scotland' s National Academy of Arts, Humanities and Sciences).

In his capacity as Visiting Academician at OSCAR, Prof. Cooper will help steer research of the new OSCAR-Prenetics ITC for Advanced Molecular Diagnostics alongside OSCAR Principal Investigator Prof. Wei Huang, OSCAR Director Prof. Zhanfeng Cui, OSCAR Visiting Professor Dr. Monique Andersson, and OSCAR Visiting Industrial Fellow Dr. Hong Chang.





# OSCAR Impact and Collaboration

## OSCAR researchers explore collaboration in energy and optoelectronics with SCHOTT Suzhou

On 3rd June, OSCAR's Head of Research Cooperation Alex Yang, along with researchers of OSCAR's Optoelectronic technology lab (OeTL) and Energy Storage and Conversion (ESC) lab, including Dr. Jingsong Huang (OeTL head, Co-PI), Dr. Jie Lin (OeTL Senior Research Scientist), Dr. Zhongqing Liu (ESC Research Scientist), Dr. Chenbo Wang (ESC Research Scientist) and Xinxin Chen (ESC Lab Assistant), visited SCHOTT Suzhou. Dr. Chong Wang (SCHOTT China R&D, CTSC centre Director), and Dr. Xiaofei Bai (SCHOTT China R&D centre 5G product specialist) hosted the visit.

*Outside the factory floor, OSCAR researchers learned about SCHOTT's history, it's development in China, and recent innovations in manufacturing, as well as SCHOTT's state-of-the-art glassware products and their applications.*

The visit featured a seminar at SCHOTT China's R&D centre, where OSCAR researchers and their counterparts gained an understanding of each other's research activities. The seminar was followed by a fruitful discussion among the researchers on potential areas for collaboration, in particular, glassware applications in energy storage, hydrogen energy and optoelectronics.

*Alex Yang, Dr. Jingsong Huang, Dr. Zhongqing Liu and Dr. Chenbo Wang presented at the seminar.*

The OSCAR delegation was also given a tour of SCHOTT Suzhou, its Customer Technology Service Centre (CTSC) and manufacturing facilities.





SCHOTT AG is a multinational high-tech company established in 1884, with 130 years of industry experience in the field of special glass, materials and advanced technology. Its main business areas include household appliances, medicine, electronics, optics, and transportation.

## School of Energy, Soochow University visits ESC lab at OSCAR

On 10th June, Prof. Jinghua Tian (Deputy Head of School of Energy, Soochow University), Prof. Donglin Han (Deputy Head of School of Energy, Soochow University), and Ms. Jing Zhang (International Cooperation Head, School of Energy, Soochow University) visited the Energy Storage and Conversion (ESC) lab at OSCAR. ESC research scientists Dr. Zhongqing Liu and Dr. Chenbo Wang, and Research Cooperation Head Alex Yang, met with the visitors.

The Soochow University delegation was given a tour of the ESC lab and Optoelectronic technology lab (OeTL) where ESC researchers introduced recent updates of the lab and their research projects on novel metal battery and hydrogen energy using catalytic water splitting.

The visit also saw an open discussion between the two parties on research collaboration, postgraduate training and commercialization of research outputs. Prof. Jinghua Tian expressed a desire to work with local research institutes on research projects and joint postgraduate training.

## OSCAR's developing profile with government agencies from across China

Since its foundation, OSCAR has been developing its profile and reputation in the Suzhou region, across China and beyond. Increasingly, OSCAR is regarded as a standout example of long-term UK-China collaboration to bring innovative technologies to market.

In June, OSCAR held meetings with over 60 visitors from government agencies from Beijing, Nanjing (capital city of Jiangsu Province), and Chengdu (capital city of Sichuan province in southwest China).

Liu Hui, Deputy Director of Beijing Municipal Science and Technology Commission and Zhongguancun Administrative Committee and his colleagues, visited OSCAR.

OSCAR General Manager Leah He met with officials from the Administrative Committee of Chengdu Hi-Tech Zone

Officials from Nanjing stopped by OSCAR as part of their study visit to SIP

# SIP News in June

## SIP Female Scientists' Alliance formed

SIP officials and women scientists marked the formal inauguration of the SIP Female Scientists' Alliance on June 16, bringing together 40 female technical experts, researchers and entrepreneurs who share the goal of employing their knowledge and expertise towards the development of SIP.

The alliance was jointly initiated by the SIP Working Committee on Women, SIP Federation of Trade Unions and several other organizations, and is designed to motivate female scientists in SIP to devote themselves to innovation and start-up projects. Various events will be organised on a regular basis to facilitate exchanges among female scientists and offer help for their work and life in SIP.

SIP Female Scientists' Alliance formed. SIP News. Sourced on 16 June, 2021, from SIP's website.SIP Female Scientists' Alliance formed_News (sipac.gov.cn)