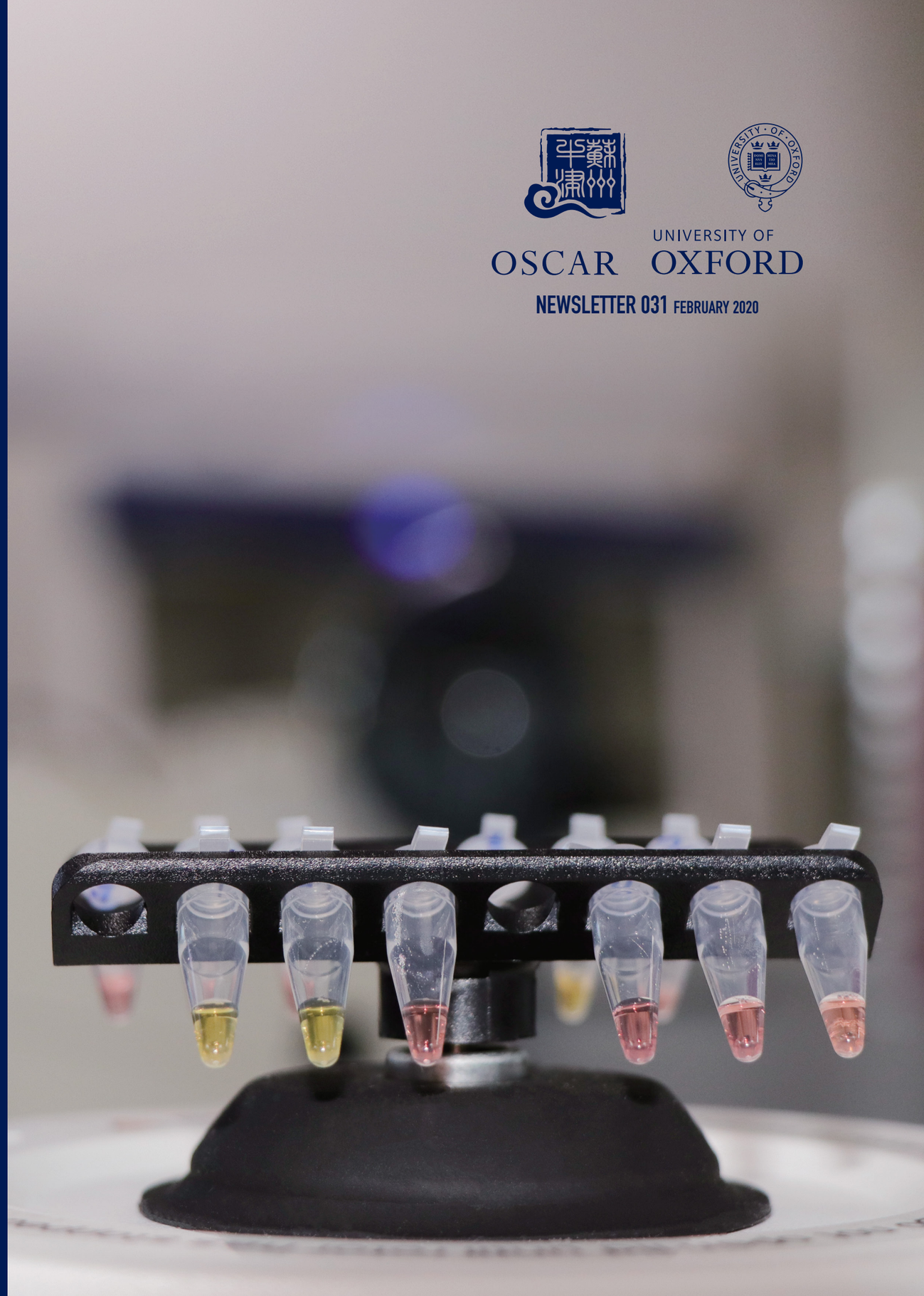
Contact us
Address: Building A, 388 Ruoshui Road, Suzhou Industrial Park, Jiangsu, P.R. China, 215123
Tel：0086-512-62869088
Email：info@oxford-oscar.cn
Website：https://oscar.web.ox.ac.uk/

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

OSCAR UNIVERSITY OF OXFORD

NEWSLETTER 031 FEBRUARY 2020



CONTENTS

"

OSCAR Develops Rapid Testing Technology for COVID-19

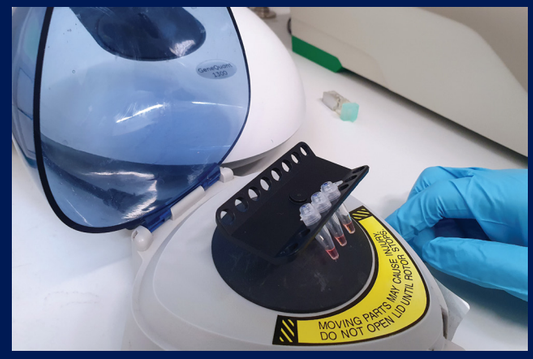
Scientists from the University of Oxford's Engineering Science Department and the Oxford Suzhou Centre for Advanced Research (OSCAR) have developed a rapid testing technology for the novel corona virus SARS-CoV-2 (COVID-19). The team, led by Prof. Zhanfeng Cui and Prof. Wei Huang, have been working to improve test capabilities as the virus spreads internationally.

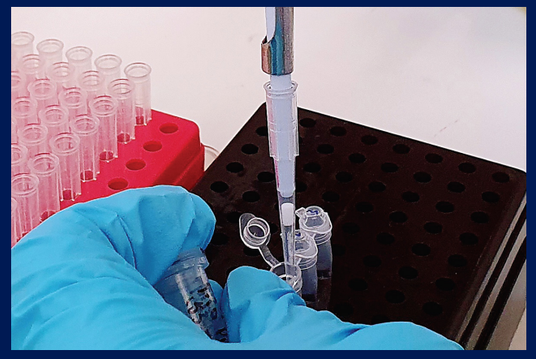
The new test is much faster and does not need a complicated instrument. Previous viral RNA tests took 1.5 to 2 hours to give a result. The research team has developed a new test, based on a technique which is capable of giving results in just half an hour – over three times faster than the current method.

Prof. Wei Huang says: "The beauty of this new test lies in the design of the viral detection that can specifically recognise SARS-CoV-2 (COVID-19) RNA and RNA fragments. The test has built-in checks to prevent false positives or negatives and the results have been highly accurate."

Additionally, the technology is very sensitive. This means that patients in early stages of infection may be identified sooner, potentially helping to reduce the spread of the coronavirus SARS-CoV-2 (COVID-19). The technology only requires a simple heat-block which maintains a constant temperature for RNA reverse transcription and DNA amplification, and the results can be read by the naked eye. This makes it potentially useful in rural area or community healthcare centres.

The technology has been validated with real clinical samples at Shenzhen Luohu People's Hospital in China. Shenzhen Luohu People's Hospital has applied the rapid detection kits on 16 clinic samples, including 8 positives and 8 negatives, which have been confirmed by conventional RT-PCR methods and other clinical evidence. The test results using the rapid detection kits were all successful.



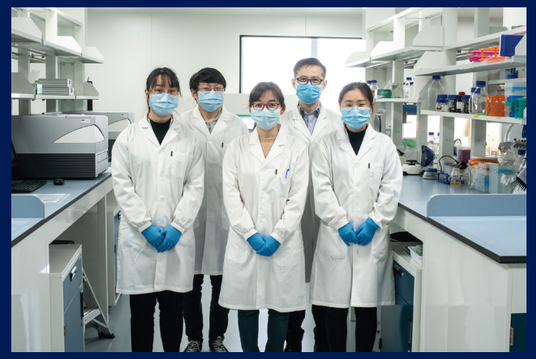


The test uses a simple colour change to identify presence of the virus. Positive samples change from pink to yellow. Each test uses three vials, each with different primers. A positive test would turn two samples pink, and leave one yellow as a negative control to confirm the test is working.

Prof. Zhanfeng Cui, the Director of OSCAR, says: "I am proud of our team that have developed a useful technology and can make a contribution in combating COVID-19, and we are very grateful to the hospital's medical team led by Dr. Xizhou Sun, Dr. Xiuming Zhang and Dr. Dan Xiong for their part in testing this new technology."

The Oxford scientists are now working to develop an integrated device so that the test can be used at clinics, airports, or even for home use. They are planning to run clinical validations within the UK and exploring options for production of the test kits.

The project was initiated by Oxford Suzhou Centre for Advanced Research (OSCAR), a University of Oxford centre in Suzhou Industrial Park. The experiments to develop the technology were performed in the Department of Engineering Science at the University of Oxford.



The project, in response to an urgent call from MRC, was initiated by OSCAR and undertaken by OSCAR researchers in Suzhou (left) and Oxford, with support from scientists of the Department of Engineering Science at the University (right). The two teams worked together to deliver a solution in just 6 weeks. Their presence in China gave them unique access to Chinese hospitals at the virus' epicentre.

Read the full article here:
http://www.ox.ac.uk/news/2020-03-18-oxford-scientists-develop-rapid-testing-technology-covid-19

This news story has been picked up by media outlets across the UK, including the BBC and Daily Telegraph, as well as the New York Post and Fox News in the USA.

Recent OSCAR Publications

Prof. Mark Moloney's group published a new review article *"Diazo and diazonium compounds for surface modification"* in *Tetrahedron Letters*. Dr. Dandan Wang, Dr. M. Kamran Khan and Prof. Mark Moloney are joint authors for OSCAR.

Wang, D., Khan, M.K. and Moloney, M.G. (2020). Diazo and diazonium compounds for surface modification. Tetrahedron Letters 61(14): 151672.
https://doi.org/10.1016/j.tetlet.2020.151672

Prof. Mark Moloney

Dr. Dandan Wang
Research Scientist

Dr. M. Kamran Khan
Research Scientist

Digest paper

Diazo and diazonium compounds for surface modification

Dandan Wang [b], Muhammad Kamran Khan [b], Mark G. Moloney [a, b]

Show more

https://doi.org/10.1016/j.tetlet.2020.151672

Get rights and content

Highlights

- Use of diazo and diazonium compounds for surface modification has been reviewed.
- These reagents may extrude nitrogen to generate reactive carbenes or radicals.
- These reagents may react directly by diazonium coupling.
- These reactive species easily react at interfaces.
- Such reactions modify surfaces without alteration of the bulk material.

Abstract

This digest surveys recent trends in the development and application of diazo and diazonium compounds for the surface modification of diverse materials; the interest in these reagents derives both from their ready capacity to extrude nitrogen and in so doing generate reactive species, such as carbenes or radicals, or to react directly by diazonium coupling, with both processes easily capable of occurring at interfaces, leading to the modification of surface chemical functionality without alteration of the bulk material.

OSCAR Research Work Continues Amid the COVID-19 Outbreak

On 17th February, OSCAR resumed operations with the majority of researchers back in Suzhou. After consultation with their PIs, research groups adjusted their monthly work plan to minimise face-to-face meetings and outreach activities during the COVID-19 epidemic. Research work in OSCAR laboratories was able to run smoothly, with extra attention paid to regular disinfection and ventilation to promote the health and wellbeing of all staff.

The AI for Healthcare group, led by Prof. David Clifton, developed a deep graph learning model for analysing genetic data from whole genome sequencing, and two deep learning models for multi-variate data collected from multi-channel sensors. They also worked on validation and testing on the genetic dataset of pathogenic bacteria, the sensor datasets of fECG and BCG (or other publicly available datasets). The group is now preparing this research for publication.

The Regenerative Medical Engineering group, led by Prof. Zhanfeng Cui and Prof. Hua Ye, have been working on RNA extraction from umbilical cord cells using a Trizol method. They completed a thorough cleaning of the PCR laboratory and temperature control testing of PCR equipment. This work was performed to assist with RNA detection of viruses, alongside efforts to develop a virus detection test with colleagues in Oxford.

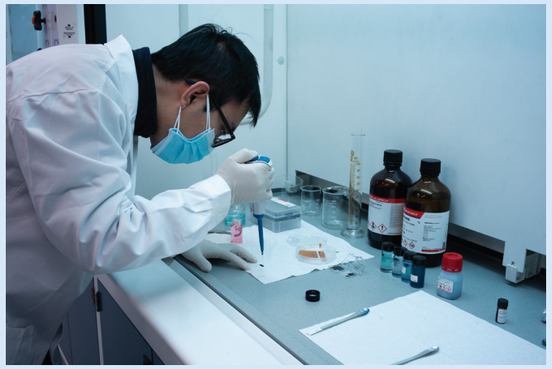
The Surface Science group, led by Prof. Mark Moloney, have been working on the modification of a polymer surface using a bisdiazo compound to obtain functional materials. They then prepared an anion exchange membrane using a specialised polymer coating for antibacterial and antiviral activity.

The C-H Activation for Drug Discovery and Synthesis group, led by Prof. Jeremy Robertson and Prof. Luet Wong, continued establishment of their monooxygenases variants library for biocatalysis via expressing these 350 P450BM3 monooxygenase variants genes and the data handling of terpenoids oxidation.

The Environmental and Synthetic Biology group, led by Prof. Ian Thompson and Prof. Wei Huang, worked with colleagues in Oxford to aliquot reagents and conduct the validation test for rapid DNA/RNA detection using isothermal amplification and carried out laboratory work on microbial enrichment of MWF samples, molecular cloning, MNP coating for biosensor detection.

The Energy Storage and Conversion group, led by Prof. Mauro Pasta, have been working on transfer of graphene from Cu foil to glassy carbon and prepared the CoPc, CuPc and NiPc solution with different concentration in DMF. They have completed installation and training of the gas chromatograph. The group also submitted a review article about 2D Layered Noble Metal Dichalcogenides in late February [in press].

OXFORD SUZHOU CENTRE FOR ADVANCED RESEARCH



Meet OSCAR's Researchers

Interview with Dr. Yang Yang

Dr. Yang Yang joined the Computational Health Informatics (CHI) lab at the University of Oxford as a senior research assistant, previously holding a K.C. Wong fellowship at the University from 2015 to 2017. She received her BEng and DPhil degrees from Shanghai Jiaotong University (SJTU) in 2006 and 2013, respectively, followed by two years of postdoctoral experience in condition monitoring of complex systems. She was subsequently appointed as an Assistant Professor at SJTU in 2015. During 2007-2008, she studied in the Intelligent Maintenance System Centre at the University of Cincinnati in the USA.

Dr. Yang is a leading researcher for the CRyPTIC project ('Comprehensive Resistance Prediction for Tuberculosis: an International Consortium') in the CHI lab at Oxford and has taken a leading role in a collaboration involving the China Kardoorie Biobank (CKB). She concurrently leads a research team of the CHI lab based at OSCAR, led by Prof. David Clifton. Her research interests include deep learning, deep graph learning, signal processing and non-parametric Bayesian inference.

Q: When did you get involved in the research work at OSCAR? What attracted you to work with OSCAR here in Suzhou?

I have been working with OSCAR's AI for Healthcare team since 2018. It will have a third full-time researcher onboard this May. It is exciting to visit OSCAR and work with our team in Suzhou. This city enjoys a superior geographical environment and convenient transport. It only takes 25 minutes to reach Shanghai by high-speed rail. Suzhou's public transport services and medical services are excellent, and the government's talent policy attracts a great number of talent.

Importantly, OSCAR is the first multidisciplinary research institute overseas of the University of Oxford, which offers a great opportunity to increase cooperation with Chinese research institutes and industry. At OSCAR, we have a cluster with state-of-the-art GPUs that is highly attractive to researchers. The same standard of protecting confidential data is applied at OSCAR as we did in Oxford.

From a career development point of view, research and translational efforts in AI and healthcare big data are booming in China. There are great challenges and opportunities.The healthcare system in China is highly digitalised and gradually integrated to overcome barriers due to isolated systems. Meanwhile, AI technologies have been widely accepted in China than anywhere else in the world. This is an exciting time to carry out cutting-edge research and technological translational activities in China. The challenge lies in that successful application of AI in healthcare typically needs specialised knowledge from the law, ethics, sociology, etc., which requires the efforts of a team consisting of members with diverse backgrounds. OSCAR has made a great effort to address the challenge by gathering a team with strong specialties and rich experience in healthcare settings. Overall, I am very excited to work closely with our OSCAR team and support the newly developed project.

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

I am currently working on a multinational project, comprehensive resistance prediction for tuberculosis, collaborating with an international consortium. Antimicrobial resistance is a global challenge in public health, which is accelerating by the misuse of antibiotics. Conventional drug susceptibility tests take up to three months for slow-growing bacteria such as Mycobacterium Tuberculosis (MTB). With the next-generation sequencing and AI technologies, it is possible to provide 'near-same-day' prediction. Our team in the CHI lab has applied conventional machine learning models and novel deep learning models to make predictions and identify resistance-conferring genetic variations in MTB. The goal is to improve prediction accuracies of resistance to all anti-TB drugs and improve the interpretability of black-box models for developing new insights in microbiology. We have published our findings in *Bioinformatics*.

As the Oxford team has implemented a successful healthcare-academics-industry model in the UK, we intend to build and localise the model in China. The goal is to apply AI technologies to cope with big data problems in the healthcare area. Current collaborations include contactless patient monitoring, patient deterioration prediction, non-invasive foetus heart monitoring. At OSCAR, we now have a team of three researchers with rich experience in both healthcare and AI areas. I am mainly supporting research activities of our OSCAR team, including developing cooperation with Chinese hospitals and industry collaborators, writing joint applications for local funding, contributing ideas for shaping the research topics and discussing research progress routinely with the team.

While visiting OSCAR, I have attended several conferences in China, including the World AI Conference in Shanghai, China International Medical Equipment Fair, China National Computer Conference and the Interdisciplinary Symposium on Bioinformatics and Infectious Diseases. In 2018, I was supported by OSCAR to attend a top conference in biomedical engineering, IEEE BHI & BSN, in Las Vegas, USA. Attendance at these conferences is very helpful for understanding cutting-edge research and industrial applications in this field.

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

At the moment, the short-term research plan is to continue the work of deep learning for genetic data, speed up the research and publish findings. The long-term goal will be extending the developed techniques on genetic data of specific bacterium to other pathogens, integrate interactions between humans and pathogenic agents, and support clinical actionable interventions for addressing challenges in the field of infectious diseases. More importantly, another short-term plan is to support our research team at OSCAR better. In the future, I will continue to work with the OSCAR team in both existing and new projects to develop cutting-edge technologies, in cooperation with our Chinese healthcare collaborators and localise the model of 'research-hospital-industry' in China.

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

It is always pleasant to stay in Suzhou and work at OSCAR. The CHI lab at OSCAR - AI for Healthcare - is on the fifth floor and next to the server room, where the GPU cluster is. The offices are spacious and very easy to host research visitors. The working area is clean, quiet and friendly which is excellent for efficient communication among lab members. While I am in Suzhou, I stay in an apartment near to an extremely convenient community centre with a nursery, primary school, outdoor stadium, shopping centre, and many universities, including Xi'an Jiao Tong-Liverpool University.

Q: Any others you would like to share?

The administrative team of OSCAR is very efficient and productive. They support all research activities. The team often shares helpful local academic information about conferences and opportunities of collaborations and funding; as well as information about social networking, recreational activities, housing information, and traffic arrangement, etc.

"

OSCAR's Prevention Efforts During the COVID-19 Outbreak

Amid the ongoing COVID-19 epidemic throughout China, OSCAR received approval from the local authorities to officially resume operations on 17th February 2020 following the Chinese New Year holiday and one-week teleworking. In accordance with local official notices, any employee who returned to Suzhou from outside was asked to quarantine for 7 to 14 days before returning to work.

Prior to the resumption, OSCAR had closely monitored the location, travel history and health status of each staff member as well as visiting students. Suggestions concerning date of return and self-isolation were provided for those who stayed outside Suzhou during the holiday. Logistical arrangements and necessary support were also offered on an individual basis.

In preparation for resuming operations in a safe and orderly manner, OSCAR formulated a list of instructions on epidemic prevention and control in line with government advice, both in Chinese and English, and circulated them to all staff and third-party service providers in advance. Over 1,000 medical masks were procured domestically and from oversea; along with other protective supplies such as disinfectants. The first round of disinfection and ventilation was carried out throughout the OSCAR building a few days before the resumption of business. An emergency response plan was developed. The training room on the first floor has been designated for isolated observation.

Facing the challenges of the epidemic, OSCAR implemented a number of rigorous measures in a bid to safeguard all staff in the workplace. These include:

- **Protective supplies** – OSCAR distributed 10 medical masks per week, a pack of alcohol wipes and a pack of disposable bags to each staff who resumed work. Alcohol sprays and liquid hand soaps were placed in public areas. An emergency kit was set at reception.

- **Working order** – OSCAR provisionally adjusted the seating of some staff members to minimise gathering. Face-to-face meetings were replaced by audio, video or written communication.

- **Entry management** – Building access was limited to the main gate (for staff, third-party workers and visitors) and the underground parking lot (staff only).

Disinfection in public areas

Disinfection in the tea room

Hand sterilisation at the entrance

- **Physical condition check** – Two receptionists and two security guards were stationed at the main entrance to ensure all staff, on-site third-party workers and visitors wore masks, disinfected hands with sanitizer and had their body temperature taken before entering any other areas of the OSCAR building. Anyone with abnormal body temperature or other symptoms of infection was declined entry. All staff are still required to complete online questionnaire on health condition. Detailed records were maintained and checked daily.

- **External visits** – OSCAR imposed pre-registration checks on external visitors. Information was requested from visitors and reviewed by OSCAR at least one day before arrival.

- **Disinfection** – OSCAR carried out regularly disinfection throughout the building with chlorine dioxide and 75% medicinal alcohol every working day. All cleaners were given updated trained and properly equipped.

- **Ventilation** – To avoid potential internal transmission, air-conditioning in non-lab areas was temporarily switched off. Considering the cold weather at the winter season, OSCAR purchased heaters for employees.

- **Meals and disposal** – OSCAR encouraged individual dining during the epidemic and provided streamed waste bins for used masks, gloves and food waste on each floor.

OSCAR has monitored the situation closely throughout and took proactive steps to ensure every staff has access to the latest advice. OSCAR also maintained contact with the local authorities and the University of Oxford. On 28th February, SIP officials conducted an on-site inspection of OSCAR's anti-epidemic measures.

From 25th February, Jiangsu Provincial People's government lowered the provincial public health emergency response level from Level I (the highest) to Level II. By the end of February, Suzhou has seen a total of 87 cumulative confirmed cases and no new case reported for 12 consecutive days.

With continuous and concrete actions, all OSCAR staff are safe from the outbreak and most aspects of work has been brought back to normal track gradually. The epidemic has halted PIs' on-site work plans at OSCAR for the foreseeable future.

It is still unclear how the situation will unfold in both China and the UK. OSCAR will strictly follow official announcements to adjust work plans in the next few months accordingly.

Body temperature measurement

Protective products for staff

Emergency kit at reception

I would give the thumbs-up to OSCAR's epidemic prevention and control measures! Strict but warm. They communicate the latest information and Suzhou policies to employees in a timely manner, distribute the necessary personal protection supplies, provide tailored assistance to individuals, and regularly disinfect the entire building. Without these, it is impossible for us to return to work and continue our research. Thank you, OSCAR!

— Dr. Jingsong Huang, Senior Research Scientist

Our admin team informed us about the epidemic from the very beginning, and at that time there were not any cases reported in Suzhou. They always kept me updated with related news in English and provided me masks and safety goggles while leaving Suzhou for the Spring Festival. OSCAR also supported me while returning to China, over changes in schedules, approved quarantined period, and arranged isolated local travel suggesting strict avoidance of public transport. I am happy to get back to work at OSCAR with clear instructions and a careful approach.

— Dr. Keval Sonigara, Research Scientist

Amid the outbreak of COVID-19, our General Manager keeps in contact with each of us to confirm our health status, showing care about our concerns. Our Office Department makes the sure that each employee gets enough protection at work and our facility team tries their best to assist our work during this special period. In general, OSCAR gives us good care and tries the best to avoid any potential infection with very detailed procedures. I am glad to work here!

— Dr. Dandan Wang, Research Scientist

I am very grateful for the care and help of OSCAR team during the COVID-19 epidemic. Our health remained the top priority for OSCAR during the epidemic. We were supported by the OSCAR admin team as well our PIs to work from home. Our health was checked on a daily basis and we were regularly provided with masks and disinfectants. Because of the safety measures of OSCAR, together with the Suzhou government response, I felt safer at Suzhou during the epidemic.

— Dr. M. Kamran Khan, Research Scientist

Disinfectants

Cleaning tools

Posters for anti-epidemic measures

OSCAR Office Department Supports Staff Working and Living in Suzhou

As a section of the OSCAR administrative team, the Office Department is responsible for facilitating the operations of OSCAR from the aspects of HR, publicity, and event organisations, among other matters.

Following the global recruitment, OSCAR is attracting a growing number of international talent to work in Suzhou. In accordance with Chinese legal requirements, every non-native employee must obtain a work permit, a work visa and a residence permit to legally work in China and it usually takes one to two months for applications. To ensure OSCAR non-Chinese employees begin work on time, the Office Department puts in sustained efforts to coordinate visa and permit application procedures, including collecting and translating documents, submitting applications online and offline, and assisting in medical examination for residence permits after entry and accommodation registration at the local public security bureau. The department also provides support for permit extensions accordingly. 10 employees from 5 countries have been granted visas and permits so far. In November 2019, the Administrative Coordinator Vailia Xue gained a certificate from SIP Exit-Entry Administration Bureau as a qualified foreign affairs specialist who are entitled to extend permits without presence of applicants. In addition, the department also provides apartment reservations, transport arrangements and travel guidance, etc. to help non-local new recruits settle in to Suzhou with a trouble-free start.

The logistical arrangement for PIs is another matter of responsibility for the department. As OSCAR PIs are renowned professors from the University of Oxford, they qualify for the 'R Visa' (also known as 'China Talent Visa') with up to a ten-year validity period with multiple entries. A confirmation letter issued by the State Administration of Foreign Experts Affairs is a prerequisite for the application. The office team performs the duty of submitting relevant material online on behalf of PIs for confirmation-Visa registration. 12 PIs have already received confirmation letters for their R Visa applications.

Reporting to the General Manager, the Office Department serves a major role in creating an employee-friendly environment at the workplace. Diverse team building events are organised periodically to promote team spirit and staff cohesion. Such events include monthly birthday celebrations, cultural immersion events linked with traditional Chinese holidays, family days, and themed training. A fully equipped gym was opened at OSCAR in May 2019, an employee table tennis tournament was held in December 2019 and the OSCAR reading room was launched in January 2020 to promote health and work-life balance among all OSCAR staff.

SIP News for February

All Fortune 500 Industrial Enterprises in SIP Have Resumed Operations

The latest statistics show that all the Fortune 500 industrial enterprises in SIP have resumed operations after a short shutdown due to the outbreak of the coronavirus disease (COVID-19) epidemic. More widely, about 3,000 enterprises in SIP have restarted their operations while the epidemic continues in China at a lower level.

Samsung Electronics (Suzhou) Co. Ltd., an arm of South Korean multinational conglomerate Samsung, has reported 1,722 of its 2,208 employees already back to work. AU Optronics (Suzhou) Corporation, a branch of Taiwan-based electronics manufacturer AU Optronics (AUO), has seen 70% of its staff (over 8,000 in total) back.

The enterprises' fast resumption of operations are due in part to SIP's all-around efforts to fight against the virus and secure local economic development.

SIP Administrative Committee and CPC SIP Working Committee on 14th February released 'Several Opinions of SIP on COVID-19 Prevention and Control and Bolstering Steady and Sound Development of Enterprises', announcing 15 policies to offer enterprises tax breaks, subsidies and more considerate services to help them get through the difficult time.

Furthermore, SIP authorities at all levels are enhancing inspections over local enterprises' anti-epidemic measures, taking multiple measures to ensure enough supplies for their operations and their staff's daily life, and helping solve other difficulties caused by the epidemic.

SIP authorities' fast and effective response to the epidemic has gained the investors' trust and boosted their confidence. Three foreign-funded enterprises including Endress+Hauser, Aptar and Spellman are making deployment to expand their investment in SIP.

18th February 2020

http://www.sipac.gov.cn/english/news/202002/t20200218_1098917.htm