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OSCAR UNIVERSITY OF OXFORD

NEWSLETTER 032 MARCH 2020

CONTENTS

"OSCAR's First Patent Application Filed in China

The first patent application of OSCAR, 'Primers for detecting novel coronavirus SARS-CoV-2 and test kits, methods and applications thereof', was filed to China National Intellectual Property Administration (CNIPA) on 27th March.

The project, led by OSCAR PIs Prof. Zhanfeng Cui and Prof. Wei Huang, was initiated in January when the COVID-19 outbreak started in Wuhan, China. Researchers were unable to return to China following the New Year and worked quickly to develop a quick, accurate and easy-to-use test for SARS-CoV-2. In just six weeks, OSCAR researchers and colleagues from the Department of Engineering Science at the University of Oxford achieved a working solution based on RT-LAMP technology, allowing results in only 30 minutes from sampling. The test does not require laboratory access, specialist equipment or highly trained operatives to perform, meaning it could potentially be used in a wider range of settings such as clinics, airports and even homes.

OSCAR submitted the patent application only a few weeks after the technology had been validated with real clinical samples at Shenzhen Luohu People's Hospital in China. Additional clinical tests are now underway in the UK.

OXFORD SUZHOU CENTRE FOR ADVANCED RESEARCH

Selected Media Coverage of OSCAR's Rapid Testing Technology for COVID-19

BBC Horizon

China Global Television Network (CGTN)

CNN

BBC Radio 4 Today Programme

The Telegraph

Coronavirus News Politics Sport Business Money Opinion Tech Life Style Travel Culture

UK news World news Royals Health Defence Science Education Investigations Global Health Security

Oxford University scientists develop coronavirus test which can give results in just 30 minutes

The test is three times faster than the current method, which takes between 1.5 to 2 hours

https://www.telegraph.co.uk/news/2020/03/18/oxford-university-scientists-develop-coronavirus-test-can-give/

The Telegraph

Science Focus

THE HOME OF BBC SCIENCE FOCUS MAGAZINE

FUTURE TECHNOLOGY NATURE SPACE THE HUMAN BODY EVERYDAY SCIENCE PLANET EARTH

Home > Science news > New COVID-19 test gives results in just half an hour

New COVID-19 test gives results in just half an hour

https://www.sciencefocus.com/news/new-covid-19-test-gives-results-in-just-half-an-hour/

BBC Science Focus

NEW YORK POST

Oxford University scientists develop rapid-testing tech for coronavirus

https://nypost.com/2020/03/18/oxford-university-scientists-develop-rapid-testing-tech-for-coronavirus/

New York Post

Coronavirus U.S. World Opinion Politics Entertainment Business TV Fox Nation Listen More

Hot Topics Coronavirus Latest America Together Quarantine Routine

CORONAVIRUS · Published March 18

Scientists at Oxford University have developed a rapid testing technology for coronavirus

https://www.foxnews.com/science/scientists-oxford-university-rapid-testing-technology-covid-19

Fox News

THE ENGINEER

Oxford team develops rapid coronavirus test

https://www.theengineer.co.uk/oxford-rapid-coronavirus-test/

The National

Oxford University scientists create rapid coronavirus testing kit to cut wait times

Virus results will take just 30 minutes instead of two hours

https://www.thenational.ae/world/oxford-university-scientists-create-rapid-coronavirus-testing-kit-to-cut-wait-times-1.994679

BusinessKorea

New Test Gives Results in Just Half an Hour

Oxford Scientists Develop Rapid Testing Technology for COVID-19

http://www.businesskorea.co.kr/news/articleView.html?idxno=42929

EXPRESS

Coronavirus BREAKTHROUGH: Oxford University develops rapid testing kit to help NHS doctors

https://www.express.co.uk/news/world/1257276/coronavirus-testing-rapid-test-pandemic-doctors-oxford-university-diagnosis

THE ECONOMIC TIMES

New corona test could give results in just 30 minutes

https://economictimes.indiatimes.com/news/international/world-news/new-corona-test-could-give-results-in-just-30-minutes/rapid-coronavirus-test/slideshow/74707807.cms

Recent OSCAR Publications

Prof. Mark Moloney's group published a new review article *"Functionalised Nitrogen Heterocycles and the Search for New Antibacterials and Bioactives"* in *Synthesis*. Dr. M. Kamran Khan, Dr. Dandan Wang and Prof. Mark Moloney are joint authors for OSCAR. This is the second paper the group has published in 2020.

https://doi.org/10.1055/s-0039-1690089

Prof. Mark Moloney

Dr. M. Kamran Khan
Research Scientist

Dr. Dandan Wang
Research Scientist

Synthesis
DOI: 10.1055/s-0039-1690089

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short review

Functionalised Nitrogen Heterocycles and the Search for New Antibacterials and Bioactives

Muhammad Kamran Khan, Dandan Wang, Mark G. Moloney*

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› Further Information

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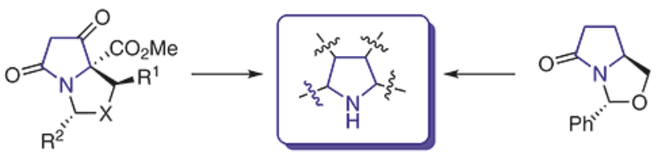

Senior Research Scientist in Prof. Zhanfeng Cui and Prof.Hua Ye's group, Dr. Hui Wang, co-published a new paper *"ALCAM (CD166) as a gene expression marker for human mesenchymal stromal cell characterisation"* in *Gene: X*.

https://doi.org/10.1016/j.gene.2020.100031

Dr. Hui Wang
Senior Research Scientist

ALCAM (CD166) as a gene expression marker for human mesenchymal stromal cell characterisation

Bas Brinkhof [a], Bo Zhang [a], Zhanfeng Cui [a], Hua Ye [a] ✉, Hui Wang [a, b] ✉

[a] Institute of Biomedical Engineering, Department of Engineering Science, University of Oxford, Oxford, United Kingdom
[b] Oxford Suzhou Centre for Advanced Research, Suzhou Industrial Park, Jiangsu 215123, China

Received 16 October 2019, Accepted 8 March 2020, Available online 14 March 2020.

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https://doi.org/10.1016/j.gene.2020.100031

Highlights

- *ALCAM* showed reliable high gene expression levels in hMSCs from different sources and under different culture conditions
- *ALCAM* gene expression can distinguish between several hMSC-lines and fibroblasts
- *EDIL3* and *TMEM47* gene expression can aid in distinguishing between hMSCs and fibroblasts
- *EDIL3* and *TMEM47* and *ALCAM* in particular, could possibly replace *ENG* and *THY1* in improved hMSC characterisation.

Recent OSCAR Honours

Two OSCAR PIs, Prof. Luet Wong and Prof. David Clifton, were awarded as 2019 SIP Jinji Lake Science and Education Leading Talents.

The Jinji Lake Talents Programme is an annual programme from SIP intended to attract and retain high-calibre talents in diverse fields with rewards or subsidies. Prof. Luet Wong and Prof. David Clifton were both elected as International Leading Talent in the Field of Research (short-term work in SIP) under the programme of Jinji Lake Science and Education Leading Talent, which was conferred on 24 senior professionals in 2019.

Six OSCAR PIs in total have received this honour so far. Prof. Zhanfeng Cui and Prof. Donal Bradley were awarded in 2017 and Prof. Mark Moloney and Prof. Jeremy Robertson were awarded in 2018.

Luet Wong

- Professor of Inorganic Chemistry, University of Oxford
- The Jennifer Green Fellow
- Fellow and Tutor at St Hugh's College, University of Oxford
- Founder of Oxford Biotrans Ltd.
- Winner of the 2018 Emerging Technology award of the Royal Society of Chemistry, UK

David Clifton

- Professor of Clinical Machine Learning, University of Oxford
- Research Fellow of the Royal Academy of Engineering
- Visiting Chair in AI for Healthcare at the University of Manchester
- Fellow of Fudan University, China
- AI Research Director of Sensyne Health, a "Clinical AI" company
- Joint winner of the 2018 inaugural "Vice-Chancellor's Innovation Prize"
- Winner of the 2016 Grand Challenge award from the UK Engineering and Physical Sciences Research Council

Ongoing Collaborations

On 3rd March, OSCAR PIs Prof. Luet Wong and Prof. Jeremy Robertson held a conference call with Dr. Zaozao Chen, Technical Director of the Institute of Biomaterials and Medical Devices (IBMD), Southeast University, to discuss potential collaboration. IBMD has developed an organ-on-chip system which could be used to screen new drug candidates discovered in OSCAR.

On 20th March, a group of SIP officials led by Mr. Zhu Huan, Deputy Director of Bureau of Commerce of SIP Administrative Committee and Bureau of General Coordination of China (Jiangsu) Pilot Free Trade Zone Suzhou Area Administrative Committee, visited OSCAR. After a brief tour of OSCAR laboratories, the group exchange ideas with OSCAR regarding research, collaborations and operations, such as research programme applications, technology transfer, foreign talent entry and exit policies, experimental equipment imports and international data exchange.

Dr. Yun Wang gives the SIP delegation a tour of OSCAR's Environmental Biotechnology and Synthetic Biology Laboratory.

Meet OSCAR's Researchers

Interview with Dr. Muhammad Irfan Arif

Dr. M. Irfan Arif received his Master's in Basic and Molecular Microbiology from University of Karachi, Pakistan. After five years as microbiologist at GlaxoSmithKline, and another four as biology lecturer in Pakistan, he left to undertake PhD research at Groningen Biomolecular Sciences and Biotechnology Institute, University of Groningen, the Netherlands. He defended his PhD in October 2018 and joined OSCAR in May 2019 as a Research Scientist in Prof. Ian Thompson's group in the Environment and Biotechnology lab.

In Groningen, Dr. Irfan first worked on biodegradation of halogenated alcohols found as a biproduct from epichlorohydrin synthesis. He isolated a novel Pseudomonas strain and genetically modified it by transposon mutagenesis to generate a trichloropropane degrader. Later, he worked on developing a process for chemoenzymatic peptide synthesis, and isolated novel enzymes for C-terminal modification of peptides by different chemical reactions, for example, amidation, deamidation, and esterification etc. – an important step in chemoenzymatic synthesis of peptide drugs.

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

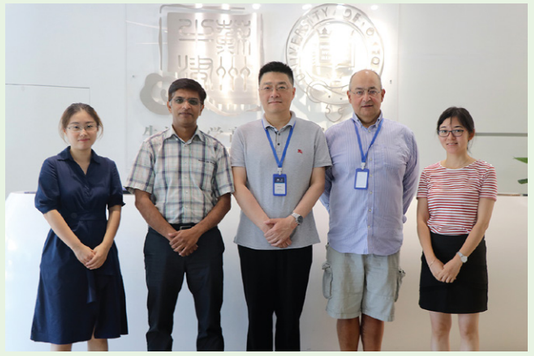
I joined OSCAR in May 2019. When I finished my PhD, my first choice was to join a start-up. I believe that a start-up can be very challenging and rewarding at the same time. Moreover, one can play a pioneering role in establishing a new setup and can pursue research in multiple directions. China was one of my first choices for two reasons. First, as Pakistanis, we regard China as our best friend and secondly, I believed it would be easier for me travel to and from Pakistan. When I came across the post published by OSCAR in December 2018, I immediately applied. Things went very smoothly and I came to OSCAR in May 2019.

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

I am working on a couple of projects in our biotechnology lab. For the most part, I am working on treating toxic industrial wastewaters, particularly metalworking fluids. It is a huge industry in China that generates a lot of waste that goes untreated. And if it is treated, it is very costly using regular methods. We are collaborating with a company, 'Kerun', in Nanjing that produces metalworking fluids and trying to make a biotreatment system for them.

We are looking for one that not only treats the toxic waste but also converts it to useful substances, for example bioplastics. In parallel, I am also working on developing some biosensors for detection of toxic pollutants in water and soil.

Last year, in August, I participated in the Baotou UK-China Innovative Technologies Roadshow and talked to industries about potential collaboration. Other than that, I also attended conferences in Shanghai and Nanjing and presented our group's work there.



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

Almost all of my first half year has been dedicated to establishing the new biotechnology lab at OSCAR. After that, I am working on developing a biotreatment plan for waste metalworking fluids. The first phase of developing a biotreatment system is to isolate microorganisms from nature that can breakdown toxic compounds in the waste stream. After we isolate some efficient bugs, I would like to go for the specific enzymes from these bacteria and develop robust enzymes and strains that can be used to treat the toxic waste and simultaneously convert that into useful compounds.

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

OSCAR is an international organisation and so I was very comfortable before coming here. The administration team helped me a lot to settle in. Without any knowledge in Chinese, it was a bit difficult in the beginning to communicate with anyone in English. Later, I found some Pakistani students and since then, it has been very easy. Suzhou is the Venice of China with so many beautiful lakes. I have undertaken some visits to old town temples and I really liked the serene environment there. Apart from my research, I have a huge interest in programming, and I am learning Python in my free time.

OSCAR's New Researcher

Ng Chun Kiat

Senior Research Scientist
Prof. Ian Thompson's group

Dr. Chun Kiat Ng joined OSCAR as a Senior Research Scientist in Environmental Bioengineering in March 2020. He was a recipient of the Commonwealth Rutherford Fellowship and a visiting postdoctoral research fellow at the University of Oxford. Previously, he completed his PhD training at the Singapore Centre for Environmental Life Sciences Engineering and Nanyang Technological University where he worked on biofilm engineering and bio-nanotechnology towards environmental remediation and water purification.

Dr. Ng gained extensive experience in microbial biotechnology, advance imaging and analytical techniques to study biofilm metabolism and the use of membrane technology to remove trace organic contaminant from water. He also developed a sustainable method of manipulating biofilm using nanomaterials to remove carcinogenic heavy metals in water. He has published more than 10 peer-reviewed papers and a book chapter on biofilm biology and water purification, and he has the technical expertise and passion to understand, harness, and influence microbial biofilm communities towards environmental remediation.

Insight into OSCAR's Effective Finance Management

The Finance Department supports the day-to-day operations of OSCAR's financial accounting, management, compliance and control.

Led by Finance Manager Tracy Chen, the team established OSCAR's financial structure within the first year of foundation in compliance with the University of Oxford's financial regulations, policies and procedures as well as Chinese legal requirements. Since then, seven finance-related internal policies have been implemented, ensuring OSCAR'S financial mechanism works efficiently. As a subsidiary of the University, OSCAR receives general supervision from the University's Finance and Mathematical, Physical, and Life Sciences (MPLS) Divisions, including regular reports, internal audits and the governance, risk management and assurance review.

As finance features in all of OSCAR's research and administrative work, the Finance Department maintains contact with all related stakeholders, involving the Legal Representative, OSCAR Director, OSCAR Deputy Director and PIs in order to seek their authorisation for finance related requests such as purchase requests, expense claims, etc. In an endeavour to enhance work efficiency between China and the UK, the Finance Department participated in developing an Office Automation (OA) system for online approval, which went live in July 2019. The department has devoted genuine efforts in generating five financial forms online. The budget management has also been applied to the OA system so that each research group or department is able to arrange their spending within approved budget on a yearly basis. Several themed trainings have been provided, and over 700 purchase requests and 300 expense claims have been completed in the OA system as of March 2020. Currently, the Finance Department is partnering with the software provider to promote the development of the second phase of the OA system, which will focus on involvement with approved vendors associated with quotations, purchases, delivery, invoices and payments. The updated system is expected to become operational in late 2020.

SIP News for March

Suzhou Supercomputing Centre Inaugurated in SIP

Suzhou Supercomputing Centre (SZSC), located at SIP's Suzhou International Science-Park Data Centre, is a new 210 million RMB institute launched to provide smart supercomputing solutions for science and technology development and innovation.

SZSC comprises two parts, the first of which became operational on 3rd March. The first wave, costing 70 million RMB, boasts China-leading calculation ability by virtue of best-in-class CPUs (central processing units), GPUs (graphic processing units) and other advanced equipment. Construction on the second wave will commence later this year.

SZSC will support collaborations with research institutions that have rich experience in supercomputing to augment research and enterprise in such fields as AI, biomedicine, nanotech and smart manufacturing.

"We focus on providing smart supercomputing solutions based on our advanced GPUs which enable deep machine learning and virtualisation of resources. We can serve about 100 clients at the same time," said Gu Wenbin, Deputy General Manager of SZSC. "After about three months of trial operations and improvement, SZSC is now basically able to meet the demands of SIP-based enterprises for supercomputing services".

3rd March 2020

http://www.sipac.gov.cn/english/news/202003/t20200304_1102771.htm

SIP Partners with China Unicom to Set Up 5G Innovation Centre

SIP Administrative Committee and China Unicom Research Institute (CURI), the communication technology research and development arm of telecommunications giant China Unicom, signed an MOU in a videoconference on 26th March to jointly build the CURI 5G Application Innovation Centre in SIP. The centre will develop 5G technologies and widen their application in various fields, in SIP and beyond.

The centre is the first of its kind in East China for China Unicom. It is expected to accelerate deployment of 5G network throughout SIP, an area embracing emerging industries and tech-driven industrial development.

For China Unicom, SIP provides an excellent environment for development, testing and rollout of new technologies. SIP was designated one of the country's first pilot sites for commercial use of 5G network in 2018. Last year the local authorities announced a plan to speed up 5G infrastructure construction and expand use of 5G technologies in living and production activities from 2019 to 2025.

The white paper on 5G-based Smart Cities was released at the signing ceremony to provide examples and strategies for 5G application in traffic, security guarantee, environmental protection, social governance and other fields.

26th March 2020

http://www.sipac.gov.cn/english/news/202003/t20200327_1108427.htm

PHOTO: SIP ADMINISTRATIVE COMMITTEE