**PhD studentship (Full-time)**

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| Institution | Xi’an Jiaotong-Liverpool University, China |
| School | School of Science |
| Supervisors | Principal supervisor: Professor/Dr Jia Meng (XJTLU)  Co-supervisor: Professor/Dr Xinghong Luo (JITRI)  Co-supervisor: Professor/Dr Chris Sanderson (UoL) |
| Application Deadline | Open until the position is filled |
| Funding Availability | Funded PhD project (world-wide students) |
| Project Title | Discovery and development of gene methylation markers related to the efficacy of tumor immunotherapy  肿瘤免疫治疗疗效相关基因甲基化标志物发现的研究 |
| Contact | Please email [jia.meng@xjtlu.edu.cn](mailto:jia.meng@xjtlu.edu.cn) (XJTLU principal supervisor’s email address) or [luoxinghong@simcere.com](mailto:luoxinghong@simcere.com) with a subject line of the PhD project title |

**Requirements:**

The candidate should have a first class or upper second class honours degree, or a master’s degree (or equivalent qualification) in bioinformatics, biology, applied mathematics, computer science, data science, etc.

Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 6.5 or above, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

**Degree:**

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

**Funding:**

This PhD project is a collaborative research project between XJTLU (<http://www.xjtlu.edu.cn>) in Suzhou and JITRI (Jiangsu Industrial Technology Research Institute) Institute of Translational Medicine and Innovative Drug Technology in Nanjing. The student will be registered as an XJLTU PhD student but is expected to carry out the major part of his or her research at the Institute in Nanjing.

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 80,000 per annum). In addition, during the period of undertaking main research at institute in Nanjing, the PhD candidate will be provided with monthly living allowance at a standard RMB 5000 by Institute of Translational Medicine and Innovative Drug Technology.

**Project Description:**

近年来，肿瘤免疫治疗领域取得快速进步，国内外大批免疫检查点抑制剂（Immune Checkpoint Inhibitor，ICI）类药物进入临床试验甚至获批上市，这其中不乏针对泛癌种的广谱 类药物，且预后效果显著，为肿瘤患者生存改善甚至治愈带来了新的希望。然而，ICI免疫治 疗对于整体人群的客观缓解率不够理想，并且存在少量病例，出现超进展等不良事件。因此， 寻找免疫治疗预后标志物，精准筛选免疫治疗适应人群，成为当下的研究热点之一。现阶段， 用于免疫治疗预后评判的指标，大多是以基因突变和转录表达水平的检测为主。而整合更多组 学数据，将有机会进一步改进免疫治疗适用人群的筛选，使更多患者在免疫治疗中获益。 本研究项目拟基于DNA甲基化特征检测，对ICI免疫治疗的疗效进行预测，以期提供一个 更灵敏、更稳定、适应范围更广的免疫治疗辅助决策的临床检测产品。 目前已有基于基因组突变的指标，诸如dMMR、MSI、TMB等，可用于免疫治疗的辅助决 策，其中TMB等甚至写入了NCCN指南。基于转录水平的诸如炎症相关18基因免疫微环境模 型，在免疫治疗队列的回顾性研究中，也表现出不错的预后预测效果。DNA甲基化作为最常 见的表观遗传学修饰，在基因调控方面起着重要作用，已有研究表明它与基因表达之间存在一 定的相关性，说明基于DNA甲基化检测也同样有可能帮助区分免疫治疗响应高低的不同人 群。DNA甲基化在基因表达调控网络中扮演着更为精细的角色，暗示了它相对于基因组和转 录组，可能具备更加灵敏的模式特征，有助于找到包括不良反应在内的免疫治疗应答相关标志物。此外，DNA甲基化检测技术，对于样本质量的要求，低于RNA表达水平检测技术，这使 得基于DNA甲基化检测的免疫治疗辅助决策产品，可以用于更大范围的肿瘤患者人群。

In recent years, rapid progress has been made in the field of tumor immunotherapy. A large number of Immune Checkpoint Inhibitor (ICI) drugs at home and abroad have entered clinical trials and even been approved for marketing. Among them, there are many broad-spectrum drugs targeting pan-cancer species. The prognostic effect is remarkable, and it brings new hope for the survival improvement and even cure of tumor patients. However, the objective remission rate of ICI immunotherapy for the overall population is not ideal, and there are a small number of cases, and adverse events such as ultraprogressive occurrence. Therefore, searching for prognostic markers of immunotherapy and accurately screening immunotherapy-adapted populations has become one of the current research hotspots. At this stage, most of the indicators used for the prognosis of immunotherapy are the detection of gene mutations and transcription expression levels. The integration of more omics data will have the opportunity to further improve the screening of immunotherapy suitable populations, so that more patients will benefit from immunotherapy. This research project intends to predict the efficacy of ICI immunotherapy based on the detection of DNA methylation characteristics, in order to provide a more sensitive, stable, and wider range of clinical testing products for immunotherapy-assisted decision-making. At present, there are indicators based on genomic mutations, such as dMMR, MSI, TMB, etc., which can be used to assist decision-making in immunotherapy. Among them, TMB has even been written into NCCN guidelines. The immune microenvironment model based on the transcription level such as inflammation-related 18 genes has also shown good prognostic prediction effects in the retrospective study of the immunotherapy cohort. As the most common epigenetic modification, DNA methylation plays an important role in gene regulation. Studies have shown that there is a certain correlation between it and gene expression, indicating that DNA methylation detection is also possible Help distinguish different groups of people with high and low response to immunotherapy. DNA methylation plays a more refined role in the gene expression regulatory network, implying that it may have more sensitive pattern characteristics than the genome and transcriptome, which will help to find the immunotherapy response including adverse reactions. Markers. In addition, DNA methylation detection technology has lower requirements for sample quality than RNA expression level detection technology, which enables immunotherapy-assisted decision-making products based on DNA methylation detection to be used in a wider range of tumor patients.

For more information about doctoral scholarship and PhD programme at Xi’an Jiaotong-Liverpool University (XJTLU): Please visit

<http://www.xjtlu.edu.cn/en/study-with-us/admissions/entry-requirements>

<http://www.xjtlu.edu.cn/en/admissions/phd/feesscholarships.html>

**Supervisor Profile:**

**Principal Supervisor:**

Jia Meng received his bachelor degree in Electrical Engineering from Northwestern Polytechnic University in 2006, and earned his PhD in Electrical Engineering from University of Texas at San Antonio in 2011. He joined Massachusetts Institute of Technology in Feb 2012 as a Bioinformatician and the Supervisor of Bioinformatics Core Facility at Picower Institute for Learning and Memory. Between 2012 and 2014, he served as an Associate Scientist at Broad Institute of MIT and Harvard. He is now an Associate Professor at Department of Biological Sciences, Xi’an Jiaotong-Liverpool University, and has an honorary appointment from Institute of Integrative Biology, University of Liverpool. Jia Meng has previously worked on a wide variety of computational biology projects that aim at a system level understanding of gene regulation and the integration of multiple high-throughput data types and databases with advanced multivariate techniques, such as, Bayesian generative modelling, sparse representation, factorization, nonparametric approaches, etc. He has authored or co-authored more than 100 peer-reviewed publications and is now focusing primarily on epitranscriptome bioinformatics.

**JITRI co-supervisor:**

Dr. Luo Xinghong, Doctor of Chinese Medicine, Chief Chinese Pharmacist, Adjunct Professor of Hainan Medical College, Distinguished Professor of Nanjing University of Traditional Chinese Medicine, and Adjunct Professor of Chengdu University of Traditional Chinese Medicine. From 1998 to 2000, he was engaged in new drug research at Sichuan Institute of Traditional Chinese Medicine. In 2000, he joined Simcere Pharmaceutical Co., Ltd. and successively served as production manager, quality management manager, new product development manager, company deputy general manager, and president office. Director, General Manager of the Policy Affairs Department and other positions. Since 2018, he has served as the Deputy Director of the Institute of Translational Medicine and Innovative Drug Technology. He has presided over or participated in the research and development of more than ten new drugs including Class I and Class II new drugs, and obtained 7 authorized invention patents. Won 2 first prizes of Provincial Science and Technology Progress, 1 second prize of National Science and Technology Progress, 1 China Patent Excellence Award, published more than 40 academic papers, edited and published more than 30 academic monographs. Currently responsible for the policy affairs related work of Simcere Pharmaceuticals. The main social part-time jobs are: expert in the international exchange expert database of the Ministry of Science and Technology, member of the Pharmaceutical Intellectual Property Research Committee of the Chinese Pharmaceutical Association, member of the National Traditional Chinese Medicine Committee of the People's Medical Publishing House, member of the National Food and Drug Professional Educational Textbook Construction Steering Committee, and National Higher Vocational Education Member of the "Thirteenth Five-Year Plan" Teaching Material Construction Steering Committee for Pharmacy, Food and Drug Majors in Colleges and Universities, Vice Chairman of the New Drug Research and Development Professional Committee of Jiangsu Chinese Medicine Society, Member of the Continuing Education Professional Committee of the Chinese Pharmaceutical Association, Hainan Institute of Health Industry Chief Food Therapy and Health Care Expert of Academic Committee, Deputy Chairman of Expert Committee of Medicinal Alcohol Professional Committee of China Association of Chinese Materia Medica, Vice Chairman of Nanjing Quality Improvement Alliance, Member of Pharmaceutical Engineering Teaching Guidance Subcommittee of Higher Schools Pharmaceutical Teaching Guidance Committee of Ministry of Education.

**How to Apply:**

Interested applicants are advised to email [jia.meng@xjtlu.edu.cn](mailto:jia.meng@xjtlu.edu.cn) (XJTLU principal supervisor’s email address) or [luoxinghong@simcere.com](mailto:luoxinghong@simcere.com) the following documents for initial review and assessment (please put the project title in the subject line).

* CV
* Two reference letters with company/university letterhead
* Personal statement outlining your interest in the position
* Proof of English language proficiency (an IELTS score of 6.5 or above)
* Verified school transcripts in both Chinese and English (for international students, only the English version is required)
* Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)
* PDF copy of Master Degree dissertation (or an equivalent writing sample) and examiners reports available