

### PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	Department of Chemistry, School of Science
Supervisors	Principal supervisor: Dr Xuan Xue (XJTLU) Co-supervisor: Professor Yuwen Cui (JITRI) Co-supervisor: Dr. Xia Huang (XJTLU) Co-supervisor: Dr. Konstantin Luzyanin (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project
Project Title	Database Construction and AI Design of 3D Bio-printed Organoids on Chip
Contact	Please email <a href="mailto:xuan.xue@xjtlu.edu.cn">xuan.xue@xjtlu.edu.cn</a> (XJTLU principal supervisor's email address) or <a href="mailto:ycui@njtech.edu.cn">ycui@njtech.edu.cn</a> (JITRI supervisor's email) with a subject line of the PhD project title

#### **Requirements:**

The candidate should have a master's degree (or equivalent qualification) in Materials Science, Cell Culture or Chemistry. A sound knowledge of data science, statistics, numerical analysis, and machine learning is essential. Skills in at least one programming language (Python, Matlab, C++, etc) are desirable.

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.

**Please note that the joint PhD project is industry-based and the candidate is expected to undertake part of the research at the partner organization in China.**

#### **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) ...Yangtze Delta Region Institute of Advanced Materials. The student will be registered as an XJTLU PhD student but is expected to carry out the major part of his or her research at the Institute in Yangtze Delta Region Institution of Advanced Materials.

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 Suzhou, the PhD candidate will be provided with monthly living allowance at a standard RMB 5,000 per month by Yangtze Delta Region Institution of Advanced Materials. In addition, accommodation is also provided in Xiangcheng District, Suzhou.

### **Project Description:**

On the basis of multidisciplinary technologies such as biomaterials and 3D bio-printing, microfluidic chip and organoids, and multiscale computer simulation, the project aims to implement the data fusion technique to construct a multi-fidelity database of multiple 3D-bioprinted organoids and organoids-on-chip. Driven by data, it further develops machine learning model and AI design prototype for 3D bio-printing and organoids-on-chip design to stimulate the engineering application of multiple organoid-on-chips.

**The objectives** of this PhD project include:

- 1) Collection and management of experiment (Inc. synthesis, characterization and composition optimization of polymer hydrogels; cell culture and associated biological experiments; high-throughput screening experiments, data acquisition and process), simulation, fabrication and application datasets.
- 2) Design and construction of multi-modal database for organoids-on-chip design, R&D and engineering application,
- 3) Development of data fusion and deep learning model for biomaterials and biomedical.
- 4) Framework of AI-based design prototype for 3D printed organoids on chip and its engineering.

By building organoids-on-chip R&D data assets and developing AI design prototype technology, it can provide theoretical and guiding support for chip design and AI manufacturing, effectively reduce research and development costs, yet has important application value and transfer of new medical technologies to institutions and hospitals.

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/feescholarships.html>

### **Supervisor Profile:**

**Principal Supervisor:**

Dr. Xuan Xue is currently an Assistant Professor in the Department of Chemistry at Xi'an Jiaotong-Liverpool University, Suzhou, China. She received her Ph.D. degree from the University of Nottingham (UK) with full Oversea Research Scholarship. After her Ph.D., she has achieved valuable experience in both academia and industry R&D. Her research interests cover a wide range of interdisciplinary research areas from materials science, polymer chemistry, surface chemistry, 3D-bioprinting to tissue engineering, cell biology and microbiology.

More details can be found on the webpage:

<https://www.xjtlu.edu.cn/zh/departments/academic-departments/chemistry/staff/xuan-xue>

**JITRI co-supervisor:**

Prof. Yuwen Cui is currently professor and vice director of New Materials Institute at the Nanjing Tech University. He is also the scientific head of AI-based Materials Design Platform at the Yangtze Delta Region Institute of Advanced Materials. He received his Ph.D. degree from Central South University (Changsha, China), and has two decades of research experience from world-famous materials institutions prior to returning to China. His research focuses in the fields of integrated computational materials engineering (ICME), AI-based material design, high throughput characterization of micro-nano mechanical properties, and mesoscale modeling of microstructure.

More details can be found on the webpage:

<http://cly.njtech.edu.cn/info/1039/5307.htm>

**How to Apply:**

Interested applicants are advised to email [xuan.xue@xjtlu.edu.cn](mailto:xuan.xue@xjtlu.edu.cn) (XJTLU principal supervisor's email address) or [ycui@njtech.edu.cn](mailto:ycui@njtech.edu.cn) (JITRI supervisor's email) 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