XJTLU-XJTU-UoL Joint Doctoral Supervision Project (Full-time)

Reference No.	SFXJTU2618
XJTLU School	School of Advanced Technology
PhD Programme	EEE
Supervisors	XJTLU supervisor: Dr. Pengfei Song XJTU supervisor: Dr Simon Maher UoL supervisor: Professor Lang Nan XJTLU Co-supervisor: Professor Eng Gee Lim
Project Title	Droplet microfluidics for ultrasensitive biomarker nasopharyngeal carcinoma detection 基于液滴微流控的鼻咽癌生物标志物超灵敏检测
Application Deadline	Open until the position is filled

Requirements:

A UK first-class or upper second-class honours Bachelor's degree and a UK Master's degree with Merit (or their equivalent) are required for PhD admissions. Exceptional candidates holding only a Bachelor's degree may be considered on an individual basis.

Evidence of good spoken and written English is essential. The candidate should have an IELTS (or equivalent) score of 6.5 or above, if the first language is not English.

For more information about entry requirements and admission procedures of PhD programme at XJTLU, please visit:

Entry Requirement - Xi'an Jiaotong-Liverpool University

How to Apply - Xi'an Jiaotong-Liverpool University

Other Requirements (if any):

Candidates should have a background in microfluidics, biomedical, chemical, mechanical, control, electronic, or electrical engineering. Experience in molecular diagnostics, droplet generation, image analysis, system integration, or laboratory automation is desirable. Strong experimental, programming, and interdisciplinary communication skills are preferred.

Programme Structure and Fees:

Doctoral students in the joint programme are registered with both XJTLU and the UoL. Upon successful completion of the programme, the students will be awarded a PhD degree from University of Liverpool. During their doctoral studies at XJTLU, students are expected to conduct research at XJTU as visiting students. Additionally, students have the opportunity to apply for a short-term research visit to the UoL if the project requires it.

The joint doctoral programme is offered on a full-time basis, with a typical duration of three to four years. The tuition fee is RMB 99,000 per year.

Project Description:

To cultivate research talents with global leadership, interdisciplinary innovation capabilities, and international research collaboration capabilities, Xi'an Jiaotong-Liverpool University (XJTLU) fully leverages its characteristics of international education and builds upon the long-established strategic cooperation among XJTLU, Xi'an Jiaotong University (XJTU), and the University of Liverpool (UoL). This initiative integrates top-tier research resources to launch a Joint Doctoral Supervision Programme across the three institutions.

Nasopharyngeal carcinoma (NPC) is a malignancy with exceptionally high incidence in Southern China. Clinical outcome is strongly dependent on the stage at diagnosis, yet early-stage NPC is often asymptomatic, leading to delayed detection and poor prognosis. Consequently, there is an urgent need for more sensitive and reliable diagnostic approaches that enable early identification and precise disease monitoring. Circulating Epstein–Barr virus (EBV) DNA is a well-established biomarker for non-keratinizing NPC and has been widely used for screening and prognostic evaluation. Current detection methods, including quantitative PCR and next-generation sequencing, are mainly based on bulk analysis. These approaches show limited sensitivity at low viral loads and obscure viral genome heterogeneity, making it difficult to faithfully detect early-stage NPC or investigate clinically relevant EBV variants. Droplet microfluidics offers a powerful strategy for digital and single-genome analysis by partitioning samples into large numbers of isolated microreactors. This enables independent amplification and absolute quantification of single viral genomes with greatly improved sensitivity. In addition, single-genome resolution provides an effective means to study EBV genetic heterogeneity that may be associated with disease progression and treatment response. However, robust droplet manipulation, high-throughput screening, and reliable genome extraction remain key challenges for clinical translation. Therefore, developing an automated droplet-based platform for single-EBV-genome analysis is of great significance for overcoming current diagnostic limitations and advancing early, high-precision diagnosis and monitoring of NPC.

Joint Supervisory Team:

XJTLU supervisor: Dr. Pengfei Song

XJTU supervisor: Dr Simon Maher

UoL supervisor: Professor Lang Nan

XJTLU Co-supervisor: Professor Eng Gee Lim

How to Apply:

Interested applicants are advised to email Pengfei.Song@xjtlu.edu.cn the following documents for initial review and assessment (Please include the project title in the subject line).

- CV

- Two formal reference letters
- Personal statement outlining your interest in the position
- Certificates of English language qualifications (IELTS or equivalent)
- Full academic 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