

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	Wisdom Lake Academy of Pharmacy
Supervisors	<i>Please list all the names in the supervisory team. It should be consistent with the information on your approved PGRS proposal.</i> Principal supervisor: Professor/Dr. Dawei Ding (XJTLU) Co-supervisor: Professor/Dr. Tao Lu (XJTLU) Co-supervisor: Professor/Dr. Chris Goldring (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	The Development of Engineered Lactobacillus for Synergistic Cancer Photodynamic Immunotherapy
Contact	Please email Dawei.Ding@xjtlu.edu.cn (XJTLU principal supervisor's email address) with a subject line of the PhD project title. The principal supervisor's profile is linked here: https://scholar.xjtlu.edu.cn/en/persons/DaweiDing

Requirements:

A Master's degree with Merit and a Bachelor's degree with first-class or upper second-class honors are required for PhD admissions. Exceptional candidates holding only a Bachelor's degree may be considered on an individual basis in certain disciplines.

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. 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:

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 99,000 per annum). It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. The scholarship holders are expected to conduct the majority of their research at XJTLU in Suzhou, China. However, they may apply for a short-term research visit to the University of Liverpool if the project requires it.

Project Description:

The impeded nanomedicine penetration, limited immune activation and immunosuppressive tumor microenvironment are key factors hampering photodynamic immunotherapy. To this end, this project intends to develop engineered probiotics (*Lactobacillus reuteri*, Lr) conjugated with albumin nanoparticles co-delivering the photosensitizer IR780 and indoleamine 2,3-dioxygenase 1 (IDO1) inhibitor NLG919. Lr could deliver the NPs to tumor interior by their colonization and penetration abilities. Then, the antitumor immunities are activated by generating tumor-associated antigens and damage-associated molecular patterns with laser irradiation, as well as pathogen-associated molecular patterns of Lr. Meanwhile, the combination of Lr and IDO1 inhibition shifts the tryptophan metabolite from kynurenine, an immunosuppressor to I3A, an agonist of CD8⁺ T cell, thereby simultaneously mitigating the immunosuppressive TME and boosting the proliferation and efficacy of T cells. This project provides a novel idea to enhance tumor immunotherapy by enhanced drug delivery and tumor tryptophan metabolism regulation.

The research objectives in this project include:

- (1) Formulate albumin NPs co-delivering IR780 and NLG919, and its covalent modification on Lr.
- (2) Verify the key role of engineered Lr in enhancing intratumoral penetration of NPs and enhancing immune activation against tumors.
- (3) Elucidate the mechanism of enhancing immunotherapy by Trp metabolism regulation based on engineered Lr, in terms of effectively relieving immunosuppressive TME and enhancing CD8⁺ T cell lethality.

The potential candidate with an education or research background in pharmaceutical sciences (particularly pharmacology and pharmaceuticals), immunology, biochemistry or biomaterial science and engineering is highly welcomed.

For more information about doctoral scholarship and PhD programme at Xi'an Jiaotong-Liverpool University (XJTLU), please visit

<https://www.xjtlu.edu.cn/en/admissions/global/entry-requirements/>

<https://www.xjtlu.edu.cn/en/admissions/global/fees-and-scholarship>

How to Apply:

Interested applicants are advised to email Dawei.Ding@xjtlu.edu.cn (XJTLU principal supervisor's email address) the following documents for initial review and assessment (please put 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