



**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE



SMITH LAB
@NTU CCEB

FUNDED PhD POSITION: BIOMEDICAL ENGINEERING

Engineering the Blood-Brain Barrier (BBB) for Precision Gene and Therapeutic Delivery

School of Chemistry, Chemical Engineering and Biotechnology (CCEB)

AUGUST 2027 INTAKE

ABOUT THE LAB

The Smith Lab at NTU Singapore develops next-generation gene delivery technologies for challenging problems in medicine, combining protein engineering, synthetic biology, viral vector engineering, and advanced disease models. Our current focus is the central nervous system. **We are recruiting a funded PhD student to help push this programme into new territory.**

ABOUT THE PROJECT

Can we turn one of the brain's greatest barriers into part of the treatment? The BBB blocks most therapeutics. This highly experimental PhD asks whether we can engineer cells at the BBB to enable precise, localised therapeutic delivery into the brain. Work spans molecular biology, protein biochemistry, synthetic biology, gene delivery, extracellular vesicles, engineered secretion, viral vectors, and advanced human BBB models.

WHO WE'RE LOOKING FOR

- **A strong B.Sc., M.Sc., M.Tech. or equivalent degree** in biochemistry, molecular/cell biology, biotechnology, biological engineering, or a related discipline.
- **Hands-on molecular biology experience**, ideally including molecular cloning/DNA assembly, bacterial and mammalian cell culture, and related techniques.
- **A strong foundation in protein biochemistry** with practical experience in protein expression, purification and/or characterisation, using techniques such as Western blotting, ELISA, chromatography, or related methods.
- **Experimental independence and strong communication** including the ability to design and execute experiments, troubleshoot effectively, critically interpret results, and work collaboratively within a multidisciplinary team.
- **Applicants must meet all NTU PhD admissions requirements. This requirement is strictly enforced.**

VALUABLE ADDITIONAL EXPERIENCE

- **Experience with extracellular vesicles/exosomes** would be a major advantage.
- **Experience with adenoviral or other viral vectors** would be highly valuable.
- Additional relevant experience includes **membrane trafficking or protein secretion, flow cytometry, confocal microscopy, endothelial cell biology, or advanced cell culture models.**

HOW TO APPLY

Please provide by Email:

1. **CV**
2. **A short cover letter/email, maximum one page, addressing:**
 - How your previous research experience meets the criteria with concrete examples of techniques and experimental work you have personally performed.
 - Why this particular project, research environment, and team excite you.
3. **Academic transcripts and test scores are optional at this stage.** Please confirm in your letter that you meet the NTU PhD admissions requirements.

Email your application to Prof. Smith at
sheena.smith@ntu.edu.sg

Subject: PhD Application, Aug 2027 Intake
Only shortlisted candidates will be contacted.

TIP: WRITE THE COVER LETTER YOURSELF

Do not use generative AI tools. We want to understand how you think, what you have done, and what motivates you. Generic mass mailings or obviously AI-generated applications will not be considered.