

|| SEMS: RESEARCH PROJECT DESCRIPTION

1. Project Background and Description



NEW APPROACH TO REPAIR FETAL MEMBRANES MAY PREVENT PRETERM BIRTH

The integrity of the fetal membranes that surrounds the baby in the womb during pregnancy is vital for normal development. Once the fetal membranes have ruptured or are damaged, they fail to heal leaving a defect until the end of pregnancy. This condition is called pre-term premature rupture of the fetal membrane (PPROM) and in England affects 1 in 9 pregnancies every year. Currently, there are no clinical solutions to improve healing of the fetal membranes after they rupture.

Our research has found a reason for this poor healing response and this technology, could help to delay delivery, prevent PPRM and preterm birth.

<https://www.sems.qmul.ac.uk/news/4988/new-approach-to-repair-fetal-membranes-may-prevent-birth-complications>

You will develop a clinical solution to repair defects in the fetal membranes using skills in cell biology, biomechanics, imaging, tissue engineering, nanotechnology and regenerative medicine.

You will work with a multi-disciplinary team of scientists (@ttchowdhury), clinicians (Prof Anna David @prenataltherapy), engineers (Dr Himadri Gupta) from QMUL, Barts and The Royal London Hospital, UCL, University College London Hospital and KU Leuven.

You will help to raise awareness of our campaign to #SaveBabiesLives and prevent PPRM with Little Heartbeats and UCLH Prenatal Charity.

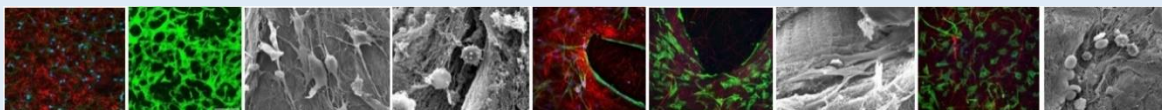
<https://www.little-heartbeats.org.uk/>

<https://www.justgiving.com/fundraising/uclh-prenatal-therapy-fund>

Virtual interviews will follow a two-step on-line process where you will 1. Present your research to date and 2. Show how your scientific and technical skills align with the proposed work in **Regenerative Medicine**.

More about Dr Tina Chowdhury's research, publications, news stories and press releases.

<https://www.sems.qmul.ac.uk/staff/research/t.t.chowdhury>



2. Project Scope

Three research project objectives

- Examine the differential mechanisms of wound healing triggered by the amniotic cell populations in human fetal membranes.
- Develop a biomechanical model to study cell and tissue mechanics and fibrillar remodeling mechanisms.
- Determine the changes in cell and fibrillar mechanics during fetal membrane weakening and rupture.

3. Desired Skills from the Student

Key skills needed for the PhD project

- Collaborative and multi-disciplinary
- Background for example in cell/molecular biology, biomechanics, tissue engineering and regenerative medicine.
- The candidate must have a strong interest in Clinical Regenerative Medicine and Engineering Better Medicines for Healthcare
- Must be able to demonstrate development of techniques in for example synchrotron SAXS, IMF confocal microscopy, SHG and multiphoton imaging or RT-qPCR.

4. Supervisory Team

Primary: Dr Tina Chowdhury, Institute of Bioengineering, SEMS.

Secondary: Dr Himadri Gupta, Institute of Bioengineering, SEMS and Prof Anna David (UCL and UCLH).

Additional: Prof Jan Deprest (KU Leuven and UCLH).