

Self-funded PhD studentship. Supervisor A. López Bernal

Human parturition and Preterm labour: risk factors and regulatory mechanisms

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Keywords: biochemistry, endocrinology, medical / clinical science, molecular biology, pharmacology

Preterm labour and failed induction of labour are prominent causes of perinatal mortality and morbidity with long term handicap, as well as maternal complications. The aim of this project is to increase our understanding of the mechanism of human parturition by identifying key proteins associated with labour in intrauterine tissues (amnion/chorion/decidua and myometrium) and their posttranslational modifications (phosphorylation) in normal spontaneous labour and in idiopathic (uncomplicated) and infection associated preterm labour. The project will involve the study of clinical risk factors associated with preterm labour and laboratory studies on myometrial function. The results from this research will facilitate better approaches to control uterine contractility, either to inhibit preterm labour safely with fewer side effects, or to induce labour in a more effective manner. Uterine tissues will be obtained with ethical approval and informed consent from women delivering at St Michael's Hospital, Bristol. Laboratory work will be based at the Dorothy Hodgkin Building.

We have clear data showing that in idiopathic preterm labour there is activation of the calcineurin-NFAT (nuclear factor of activated T cells) cascade as well as changes in proteins with GTPase and calmodulin binding activities. By contrast in infection-associated preterm labour there is activation of multiple cytokine-mediated signalling and thrombin receptor pathways which are not seen in uncomplicated preterm labour. Our current work has highlighted novel pathways which we now need to explore in greater detail using cell signalling and protein phosphorylation methods.

There is a need to develop uterine-specific drugs that relax myometrial smooth muscle selectively, so that preterm labour can be inhibited with minimal side effects for the mother and the baby. The results will provide new uterine targets for pharmacological intervention. This project will be ideal for a PhD student interested in clinical and laboratory aspects of human parturition and preterm labour.

Funding notes:

Requires full time PhD tuition fees for three to four years

Bench fee (annual): £15,000

Subject areas: Medical/Clinical Science. Endocrinology. Biochemistry. Pharmacology. Molecular Biology.