

**Department of Paediatric Orthopaedic Surgery
COLLEGE OF MEDICINE**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2010

The Department of Pediatric Orthopaedic Surgery is pleased to offer the following research project for the summer of 2010. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE: NOVEL MOUSE MODEL OF NEONATAL BRACHIAL PLEXUS INJURY

**Assistant Professor Roger Cornwall
Department of Pediatric Orthopaedic Surgery Research
Cincinnati Children's Hospital Medical Center
Burnet Campus Location C & D, Floor 3, Suite 3545 (Ortho Surgery)
3333 Burnet Avenue
Cincinnati, OH 45229 (MLC 2017)
Tel: (513) 636-7319 (Julianne Hackman)
Fax: (513) 636-3928
Email: Roger.Cornwall@cchmc.org**

Project Description

Neonatal brachial plexus injury (NBPI) is a neuronal injury which occurs during some difficult births (1.5 per 1000 births in the US) due to traction on the baby's neck leading to varying degrees of damage to the nerves that innervate the muscles of the arm. Paralysis from minor stretched nerve damage normally resolves itself within a few months, but more severe forms of damage such as nerve rupture and root avulsion which cause denervation of postnatal muscle lead to long term complications. Some of these complications include the development of contractures that restrict the range of motion of the shoulder and elbow joints. It is not known why and how these contractures occur, and gaining this knowledge would greatly assist in the treatment and improvement of the quality of life of affected children.

We hypothesize that altered postnatal growth and development of denervated muscle contributes to contracture formation. To investigate this theory, we have created a novel surgical model of NBPI in neonatal mice which develop clinically relevant contractures at the shoulder and elbow by 4 weeks post-operatively. Preliminary investigations on elbow contractures have localized the pathological defect to the muscle and not the joint capsule, and that this muscle shows signs of fibrosis and reduced growth both longitudinally and in cross-sectional area. Potential summer projects will utilize histological techniques to further explore muscle growth, muscle pathology or the level of innervation within the skeletal muscle of NBPI model mice.