Pulmonary Sequelae of Preterm Birth: Time Course of Recovery

Application deadline: Applications accepted all year round

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Funding: Self-funding only

Project Outline: The long-established belief that alveolarisation was complete by three years of age has been challenged. Our studies indicate that the window for catch-up lung growth is wider than previously thought. This has important implications for timing of possible interventions designed to ameliorate the effects of chronic lung disease. The three processes that unite to determine the structure of the lung periphery following preterm birth are lung development, injury, and repair. The net effect may vary with degree of prematurity and the postnatal age at the time of investigation, as well as the extent of the initial insult to the lung, and other factors (e.g. genetic factors, early respiratory infections, medications etc). It is therefore imperative that we extend our previous studies in two ways, (i) to increase the number of preterm-born children, including those at higher risk of lung injury, and (ii) to study preterm-born children and controls during mid-childhood (aged 5-10 years). In this way we will have a better understanding of the nature and extent of lung abnormalities following pre-term birth, and of the timing of resolution of lung injury.

The specific questions to be addressed in this PhD proposal are:

1. How do differences in lung physiology between preterm-born children and controls change with age?
2. Can we better describe the differences in lung physiology between term-born controls and children born pre-term, differentiating according to degree of prematurity and presence/absence of chronic lung disease?

Programme of work: The physiological measurement techniques are all established (spirometry, plethysmography, multiple-breath nitrogen washout and $^{3}$HeMR). Recruitment of children will be from the Neonatal Survey and will include those born preterm and full-term controls. Since the youngest age at which children will be able to fully co-operate with all measurements is not established, it is envisaged that the first children to be studied will be those aged 9 to 10 years, to be followed by progressively younger children down to the age of 5-6 years.

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