

# **The Effects of Intrauterine Growth Restriction (IUGR) on the Pulmonary Surfactant and Lung Injury**

**Background:** Acute respiratory distress syndrome (ARDS) is defined as severe lung dysfunction that occurs after an insult to the lung such as an infection. The lung dysfunction in ARDS is due to alterations to surfactant, a lipid-protein mixture coats the inside of the lung and maintains the lungs' ability to expand easily during respiration. Due to surfactant dysfunction, and a lack of effective pharmacological therapies, ARDS is the most common cause of death in the ICU. Our research focuses on risk factors that indicate a susceptibility to the disease, which could provide new and earlier therapeutic options. One such potential risk factor is intrauterine growth restriction (IUGR), which is defined by a low birthweight and contributes to a variety of adult onset diseases. We hypothesize that IUGR is a risk factor for ARDS through alterations to the surfactant system.

**Methods:** We will use an IUGR rat model induced by maternal low protein diet. Surfactant function and ARDS susceptibility in IUGR offspring will be assessed from birth to adulthood.

**Results:** Preliminary data indicates that IUGR leads to some changes in lung function. We anticipate that IUGR rats will be more susceptible to surfactant alterations and ARDS development.

**Discussion & Conclusion:** Investigating the IUGR effects on surfactant and understanding the surfactant-related processes in ARDS could give insights how to interfere with these processes to improve outcomes.

**Interdisciplinary Reflection:** This novel approach involves input from different disciplines such as biophysics, biochemistry, medicine and histology, which together will ultimately help to develop new therapies.