Maternal Protein Restriction (MPR): A Risk Factor for Acute Respiratory Distress Syndrome (ARDS)

**Background:** Acute respiratory distress syndrome (ARDS) is defined as severe lung dysfunction. The lung impairments in ARDS result from alterations to pulmonary surfactant; a lipid-protein mixture coating the inside of the lung and maintains the lungs’ ability to expand easily. Due to a lack of effective pharmacological therapies mortality associated with ARDS is over 30%. Our research focuses on risk factors that indicate a susceptibility to the disease, which could provide new and early therapeutic options. One such potential risk factor is Maternal Protein Restriction (MPR). MPR is defined by low birth weight and contributes to a variety of adult-onset diseases. We hypothesized that under a systemic inflammation MPR is a risk factor for developing ARDS through alterations to the surfactant system.

**Methods:** MPR was induced in pregnant rat model via a low protein diet. Surfactant function and ARDS susceptibility in MPR offspring were assessed from birth to adulthood.

**Results:** MPR altered the lung function at early post-natal life. Preliminary results show that total surfactant content decreased significantly in adult males. We anticipate that surfactant reduction and altered lung function can develop severe lung injury.

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

**Keywords:** ARDS, Maternal Protein Restriction, Lung, Surfactant, Inflammation