Preface

Although the survival of extremely low birth weight newborns is progressively improving, it is becoming more and more apparent that respiratory outcome depends on many factors. Genes involved in surfactant synthesis and metabolism, in alveolar stability and growth and pulmonary host defense affect the risk of developing both respiratory distress syndrome and bronchopulmonary dysplasia. The role of the intrauterine and postnatal environment is also very important. Intrauterine malnutrition and severe inflammation are associated with the worst respiratory outcome and they contribute to reducing the growth potential of the neonatal lung. Postnatal injury and inflammation caused by excessive resuscitation, mechanical ventilation and oxygen toxicity are also associated with poor respiratory outcomes. The role of the cardiovascular system in contributing to 'respiratory failure' and persistent pulmonary hypertension in some infants is underestimated. Lung vascular growth and the role of angiogenic growth factors on normal alveolar development, injury and repair is a new exciting area in neonatal pulmonology.

The 22nd International Workshop on Surfactant Replacement held in June 2007 in Ancona covered several of the key areas outlined above. The meeting consisted of seven outstanding invited lectures together with several free papers comprising both oral and poster presentations. The 10th Nils W. Svenningsen Memorial Lecture was given by Steven H. Abman from Denver, USA, one of the world leaders in pediatric pulmonary and cardiovascular research. His topic was pulmonary hypertension of the newborn. Bernard Thebaud from Edmonton, Canada, provided the latest research news on the role of vascular endothelial growth factor and other angiogenic factors during alveolar development. Mikko Hallman from Oulu,

Finland, presented state-of-the-art information on genetic and environmental factors in the pathogenesis of various neonatal lung diseases. Frans Walther from Leiden, The Netherlands, updated the audience with novel information on the role of the hydrophobic surfactant proteins B and C, and most importantly on the progress with development of new synthetic surfactants. Aaron Hamvas from St. Louis, USA, talked specifically about pulmonary diseases associated with genetic disorders of the surfactant proteins.

Bart Van Overmeire from the University Hospital Antwerp at Edegem, Belgium, discussed the present controversies surrounding closure of the ductus arteriosus in the very preterm infant, and Ola Saugstad from Oslo, Norway, reminded the audience about the toxicity of oxygen, giving some guidelines for optimal oxygenation at birth and in the neonatal period. This issue of *Neonatology* (formerly *Biology of the Neonate*) contains the important review articles and abstracts from the meeting, giving readers new insights into the complex pathogenesis of acute and chronic respiratory failure in the newborn infant. As a result of the tremendous positive impact of surfactant therapy and ventilatory support on saving very many lives, we now need to understand more fully the risk factors affecting respiratory outcome of the extremely low birth weight neonate in order to improve quality of life. To achieve these objectives, more work is needed to optimize, and perhaps individualize, ventilatory support, oxygen exposure and surfactant therapy in very preterm infants during the neonatal period.

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