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The developing lung: Morphological and functional features in the context of gas exchange, immune function, metabolic properties and exogenous noxae

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The lung is so much more than simply our organ for gas exchange. Its development starts early in embryogenesis as a derivative of the foregut and a multitude of functional aspects matures over time, including immunological and metabolic properties. At every step of development, exogenous noxae and factors derived from maternal-fetal interaction can interfere and have long-lasting consequences. An excursus in developmental pulmonary morphology along with functional maturational aspects is given. The adaptations during child birth and growth and expansion well into childhood are discussed. An emphasis is laid upon malformations, congenital diseases, drug influences and toxic impact during pre- and postnatal development. Since pediatric drug development is an ongoing hot topic but also a battle due to missing data in science and industry, testing strategies and data on comparative organ maturation in human babies and juvenile experimental animals are presented.



Recent Publications

1. Lewin G and Hurtt ME (2017) Pre- and postnatal lung development: an updated species comparison. *Birth Defects Res.* 109(19):1519-1539.
2. Sewald K, Müller M, Buschmann J, Hansen T and Lewin G (2015) Development of hematological and immunological characteristics in neonatal rats. *Reproductive Toxicology* 56:109-17.
3. Van der Burg B, Pieterse B, Buist H, Lewin G; van der Linden S, Man H; Rorije E, Piersma A, Mangelsdorf I, Wolterbeek APM, Kroese D and Van Vugt-Lussenburg B (2015) A high throughput screening system for predicting chemically-induced reproductive organ deformities. *Reproductive Toxicology* 55:95-103.
4. Lewin G, Escher SE, van der Burg B, Simetska N and Mangelsdorf I (2015): Structural features of endocrine active chemicals-A comparison of in vivo and in vitro data. *Reproductive Toxicology* 55:81-94.
5. Reamon-Buettner SM, Buschmann J and Lewin G (2014): Identifying placental epigenetic alterations in an intrauterine growth restriction (IUGR) rat model induced by gestational protein deficiency. *Reproductive Toxicology* 45:117-24.

Biography

Geertje Lewin born at the lovely Southern coast of the Baltic Sea, studied biology in the US and Germany with an ongoing passion for physiology and toxicology. After working as an eco-toxicologist, she went back into academia to achieve her PhD 2005 at the toxicology department of University Hospital Munster. Later, starting 2007, at the Fraunhofer Institute for Toxicology and Experimental Medicine, Geertje entered the world of reproductive toxicology as a study director and risk assessor. This field where toxicology, teratology, drug development and health care overlap, has fascinated her ever since. Starting in 2014, Geertje runs her own consulting company and recently joined "Preclinical Science" as a senior partner, providing advise in the fields of teratology, pre-clinical toxicology and risk management.

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