## Breathing in the minuscule newborn marsupial: size matters

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The newborn marsupial challenges the traditional view that the mammalian respiratory system must be adequately developed to act as the sole organ of gas exchange at birth. With a gestation of 13 days and a birth weight of 13 mg the fat-tailed dunnart (*Sminthopsis crassicaudata*) is one of the smallest and most immature marsupial newborns. Born with the lung at the canalicular stage of development, the skin is almost solely responsible for gas exchange in the early neonatal period. This is despite the finding that the epithelial cells appear sufficiently differentiated and that the presence of surfactant should allow for respiration. Further, the dunnart can produce central respiratory rhythm at birth, with functional central chemoreceptor response. It would appear that poor muscle co-ordination and chest wall distortion prevent breathing in the smallest of newborn mammals. In part, this is only made possible by a low metabolic rate and favourable body surface area.