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Key Lectures

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Fetal lung cells for cell therapy of lung injury in an animal model

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The regeneration-inducing capacity of the cells derived from human fetal lung has not been systematically studied for cell therapy of lung injuries. We hypothesize that due to the commitment of these cells to the the respiratory system, they have a high potential to promote regeneration in respiratory system. In this study, lower respiratory tissues were isolated from 12-19 weeks human fetuses. The cells were characterized by their morphological and gene expression profiles and their ability to form organoids. The cells were then intra-tracheally delivered to rats with pulmonary injury induced by bleomycin at day 0 and 14 after induction of injury. Rats were sacrificed on day 28 after injury and their lungs were evaluated histologically. We have shown that cell therapy reduced fibrosis and collagen deposition and promoted the regeneration of alveoli. Also, cell therapy increased the expression of surfactant protein C and IL-10 and decreased the expression of aquaporin 5 and transforming growth factor beta. Here, we show that fetal human lower respiratory tract cells can significantly increase the process of lung regeneration. This finding not only introduces a potential cell source in this area but also suggests a potential phenotypic target for the derivation of regenerative cells from multipotent or pluripotent stem cells.