

Special Issue on
**Regenerative Medicine Approaches for Lung Tissue
 Regeneration**

CALL FOR PAPERS

Lungs are the site of gas conduction and exchange, enabling utilisation of oxygen for energy generation and removal of excess carbon dioxide by-products. Comprised of a number of unique zones and repeating subunits, the lung is a highly organised and efficient organ with a gas-exchange surface area in marked excess of its overall volume. Strikingly, given their inherent capacity for repair following a number of debilitating diseases, a number of incurable diseases that progressively reduce/remove functional surface areas, also affect the lung and can result in death. Lung disorders, including chronic obstructive pulmonary disease (COPD), are amongst the leading causes of global mortality and emergency admissions. This is accompanied by an annual socioeconomic burden accounting for roughly 3% of all healthcare expenditure globally.

High mortality coupled with frequency and annual costs puts lung repair at the forefront of stem cell-driven regenerative medicine approaches. Significant challenges remain before these approaches can be fully implemented. These include the development of stem cell-based models to further our understanding of lung biology and present potential repair solutions through controlled differentiation. These approaches will require simultaneous integration with pre-existing clinical approaches, or the development of new approaches tailored towards the delivery of novel and advanced therapeutics. Furthermore, the application of decellularised or artificial biomimetic scaffolds towards organ regeneration requires careful characterisation for successful application in the creation of future therapeutic approaches.

The aim of this Special Issue is to encourage and promote the discussion and dissemination of the progress of resolving bottleneck problems in lung tissue regeneration. We solicit original research articles and review articles discussing the state of the art in this field, including: stem cell sources (e.g. pluripotent stem cells versus tissue-specific stem cells such as progenitor cells); physical microenvironments which drive stem cell differentiation into different lung cell phenotypes (e.g. substrate stiffness, 3D architecture, cyclic stretch, shear stress, air-liquid interface, oxygenation gradient, new scaffold materials versus decellularised extracellular matrix); the use of soluble factors as agents to modulate the fate of stem cells (e.g. stem cell expansion, stem cell transplantation, stem cell therapy at pre-clinical and/or clinical stages).

Potential topics include but are not limited to the following:

- ▶ Stem cell sources for lung repair
- ▶ Stem cell suitability for lung repair
- ▶ Biochemical approaches of stem cell differentiation into lung cell phenotypes
- ▶ Biomechanical approaches of stem cell differentiation into lung cell phenotypes
- ▶ 3D approach of stem cell differentiation into lung cell phenotypes
- ▶ Decellularised lung approach
- ▶ Novel biomaterial scaffold approaches for lung regeneration
- ▶ Stem cell transplantation approaches
- ▶ Scale-up of therapeutically relevant lung cell types
- ▶ Animal models for stem cell-based lung repair

Authors can submit their manuscripts through the Manuscript Tracking System at <https://review.hindawi.com/submit?specialIssue=642062>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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