The Effect of Elastin Degradation Products and Elastin Fibers on COPD and Control Lung Mesenchymal Stromal cells

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Abstract

Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation and an irreversible loss of alveolar architecture and extracellular matrix. Novel strategies aimed at the regeneration of the lost alveolar tissue are needed and may include the use of lung mesenchymal stromal cells. These cells produce anti-inflammatory factors, growth factors and extracellular matrix components, including elastin, thereby providing a potential niche for alveolar repair. The reparative capacity of mesenchymal stromal cells from the lungs of COPD patients, however, may be hampered due to oxidative stress and extracellular matrix loss, e.g. by the presence of degradation products of elastic fibers.

We investigated whether degradation products of the extracellular matrix, such as hydrolyzed elastin, affect the regenerative capacity of lung mesenchymal stromal cells and whether a supporting micro-environment consisting of intact collagen fibrils and elastin fibers improves the function of lung mesenchymal stromal cells.

Biography

Willeke Daamen PhD is a scientific researcher at Radboud university medical center. She aims to promote the intrinsic regenerative capacity of patients, mostly by using cell-free biodegradable biomaterials that stimulate the endogenous healing response of tissues. Her group has designed biomaterials that indeed influence infiltrating cells. One example is that the incorporation of solubilized elastin enhances angiogenesis and elastic fiber formation *in vivo*.

Her straightforward biomaterial designs in combination with close collaborations with clinicians, researchers and entrepreneurs will facilitate the translation to the clinic, so that patients will indeed benefit from her research achievements.

Willeke Daamen is secretary of the Netherlands Society for Biomaterials and Tissue Engineering (NBTE) and organized and chaired the 10th European Elastin Meeting. She supervised 15 past and present PhD students and has published >95 peer-reviewed papers.

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