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Macrolide mediated lung tissue selective drug of polymeric cargoes

Bocheng Wu, Stephen N Crooke, Jiri Schimer, Idris Raji, Adegboyega Oyelere and **MG Finn**
Parker H Petit Institute for Bioengineering and Bioscience, USA

The lung is an attractive target organ for drug delivery. Due to its relatively non-invasive accessibility through the airways, inhalation therapy has been the focus of pulmonary delivery efforts and significant improvements have been achieved in the management of many lung diseases over the past three decades. However, the effectiveness of inhaled therapies is limited by the lung's innate protective mucociliary system, disease-induced changes in the architecture of the lung tissue and the sub-optimal performance of nearly all inhalation delivery devices. Therefore, an alternative route for pulmonary delivery is warranted. The clinical observation of selective accumulation of macrolide antibiotics such as Azithromycin (AZM) and Clarithromycin (CLM) within the lung, spleen and liver (for eventual hepatic clearance) makes them potential ligands for targeting cargoes into the lung tissue. Within the lung tissues, AZM and CLM are selectively up taken by resident macrophage cells. In this poster, we present data showing macrolide-facilitated delivery of two polymeric cargoes virus-like particle (VLP) and a dendrimer into macrophages and lung tissue in living mice. The evidence for the influence of the cargo on delivery efficiency and the effect of the delivered cargoes on the macrophage polarization will be shown.

bradwu2016@gmail.com