

**A LIPOSOME MODEL TO TREAT *PSEUDOMONAS* IN LUNGS OF  
CYSTIC FIBROSIS AND IMMUNE COMPROMISED PATIENTS**

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*Pseudomonas aeruginosa* (*P. aeruginosa*) an opportunistic, deadly gram-negative bacterium, occurs in patients with cystic fibrosis and is a major cause of death for patients with neutropenia or ones who have suffered critical burns. There are a number of distinctive features in the lungs of affected patients that need to be addressed: *P. aeruginosa* (1) secretes a phospholipase C that lyses red cells and degrades pulmonary surfactant; (2) secretes an elastase that degrades IgG's and extra cellular matrix proteins and therefore may enhance tissue invasion; (3) secretes iron-containing compounds that are highly toxic to endothelial cells; (4) has proteins and pili that enable it to adhere to lung epithelial cells; and (5) produces a mucoid polysaccharide that anchors the cells.

Styx liposomes can be engineered and delivered to the lung by inhalation so they will: (a) be resistant to uptake by alveolar macrophages allowing them to act in the alveolar space; (b) provide phospholipids as a competitive substrate for the extracellular *Pseudomonas* phospholipase C; (c) contain competitive inhibitors of phospholipase C; (d) contain iron chelators to reduce the effects of the toxic iron-containing molecules released by *Pseudomonas*; (e) contain antibiotics active against the *Pseudomonas* infection; and (f) contain antimucolytic compounds.

Approaches (a) and (b) will reduce the destructive action of phospholipase C on surfactant and epithelial cell membranes. Further, degradation of liposomes by *pseudomonas* phospholipase C should be able to target the release of (b), (c), (d), (e) and (f) at the site of infection.

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