Antimicrobial Photodynamic Therapy (aPDT), has been proposed as a promising alternative for the treatment of pulmonary infections. Our research group has proposed the use of a non-invasive aPDT protocol in the treatment of bacterial pneumonia using respiratory delivery of the photosensitizer and external illumination. The applicability of aPDT using the photosensitizer indocyanine green (ICG) and extracorporeal activation with infrared light has been previously demonstrated for multiple bacterial agents [1-3]. However, for it to become a clinical treatment, there are four elements that need to be achieved in the translational research: the efficient pulmonary delivery of the photosensitizer; the efficient delivery of light through multiple layers of biological tissue; assured selectivity and safety for the proposed treatment; and the efficacy in killing the pathogens in a large scale and complex microenvironment.

RESULTS

In vitro, the aPDT selectively kills pathogens (S. aureus Xen 29 and 36) and nou mammalian cells (A549, J774, L929) [2]. However, demonstrating efficacy and understanding the dynamic in a more realistic alveolar microenvironment is still a goal of this project.

REFERENCES


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ICG is stable to the nebulization process and is delivered at least as efficiently as when using intranasal instillation in mice [2,4].