The Battle Against Cystic Fibrosis Complication Continues...

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Cystic fibrosis is a common fatal genetic disorder that affects over 70,000 individuals worldwide. The direct cause of death for 80% of cystic fibrosis patients is Pseudomonas aeruginosa infections in the lungs that act as inflammatory and anti-inflammatory agents in a cyclic manner causing the lung tissue to rapidly deteriorate, leading to progressive loss of lung function. Pseudomonas aeruginosa biofilms cannot be penetrated by most antibiotics and cannot be surgically removed when in lungs, because lung tissue is very delicate and can be easily damaged. The goal was to find a natural substance that penetrates through biofilms and mucoid layers, while refraining from killing lung cells. After creating extracts of Curcuma longa, Semecarpus anacardium seed, Semecarpus anacardium fruit, and Curcumin, Part 1 of the experiment was conducted, which involved Minimum Inhibitory Concentration testing using concentrations 250, 300, 350 and 400µg/ml; Curcumin killed 89.68% of Pseudomonas aeruginosa. In Part 2 of the experiment, extracts were tested on biofilms; Curcumin killed 89.88% of the bacteria within the biofilm. Part 3 of the experiment involved testing the substances' ability to penetrate through mucoid layer, and then through biofilms; percent of death when Curcumin was used was 73.76%. Part 4 was a cytotoxicity test, wherein the natural substances were tested for toxicity on lung cells to ensure that if administered to patients, they wouldn't negatively affect human cells; the lung cells had 135.36% growth when Curcumin was used. A natural cure for this fatal complication of cystic fibrosis has finally been discovered.

Awards Won:

Fourth Award of $500