

**INTRODUCTION:** Lung engineering using decellularized organ scaffolds is a potential substitute for transplantation. The process of decellularizing a rat lung spans three days and involves several detergents that rid the scaffold of any remaining cells. The success of the recellularization of a rat lung is, in part, based on the removal of the cytotoxic detergents after the three-day lung decellularization process. Optimization of a detergent-based decellularization method was tested by measuring amounts of sodium deoxycholate (SDC) residue in tissue collected after each day of the process. Detected residual detergent restricted the lung from optimum tissue recellularization.

**METHOD:** The amount of residual SDC was measured in a total of 3 rat lung samples on days 1, 2 and 3 of the decellularization process by determining the amount of methylene blue which was solubilized in chloroform. The amount of methylene blue solubilized in chloroform was found to exhibit a linear relationship with the amount of SDC in solution, up to 1% SDC (w/v). The amount of methylene blue, and therefore the amount of SDC in each sample, was determined by using spectrophotometry to measure absorbance at 630nm. Values were compared to a normal curve that was established using known concentrations of SDC diluted in DI water.

**RESULT:** A general trend of decreased SDC concentration was observed over the course of the 3-day process, which correlated with increased volumes of water rinses. However, this assay confirmed a presence of residual detergent that may be the cause of failure of recellularization.

**CONCLUSION:** Decreasing amounts of SDC at the end of the decellularization process were detected with increases in the total volume of DI water in the rinse steps. Effective washing of the tissue is necessary for the removal of detergents that may be causing the failure of recellularization. Future directions include establishing a cytotoxic threshold for SDC *in vitro*, as well as development of an assay to detect the amount of the residual anionic detergent, Triton-X 100.