Obtention of Detergent Solution for Organ’s Decellularization Process

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Transplantation is a process that consists in replace a diseased organ or tissue for a healthy exemplar of it. In many times this is the only effective treatment to cure the disease. However, the lack of donations generates a huge queue, which is aggravated by the compatibility criteria. As an alternative, the decellularization process is based on the complete remotion of the donated organ’s cellular material by a detergent solution leading to a extracellular matrix (ECM), which will be recellularized by the receptor’s embryonic cells, inhibiting the chances of rejection. Because there is no detergents that is completely effective in removing cell without damaging the ECM, the project aimed to create a zwitterionic solution (which tends to preserve ECM) but that was effective on the lysis of cells (such as non-ionic and ionic class). The starting component to the reactions was abietic acid, found in the colophony resin, provided from Pinus elliottii. The final compound was abietamidemethyl-diethylammonium acetate. The infrared spectroscopy showed the compound formation. The critical micelle concentration test (CMC) characterized the solution as zwitterionic with a value of 5.38 mM. To evaluate the removal effectiveness, cytotoxicity and hemolysis assays were performed, in which both the solution of detergent lysed cells (blood and tissue, respectively) showing high decellularizing potential. All results were satisfactory and the objectives achieved. Thus, the project presents an innovator detergent solution to be used in decelullarization, aiming the improvement of the receiver’s life quality and of organ and tissues transplants process.

Awards Won:

Fourth Award of $500