

***High Density Lipoprotein Particle Characteristics and the Risk of Acute Kidney Injury After
Cardiac Surgery***

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Up to 30% of cardiac surgery patients develop postoperative acute kidney injury (AKI). AKI increases a patient's risk of complications and death. No effective treatments currently exist. Preoperative high density lipoprotein (HDL) levels are associated with a decreased risk of AKI after cardiac surgery. Some HDL particles have anti-oxidant and anti-inflammatory functions that may attenuate AKI. HDL particle size and protein composition can alter these functions. During this project, we will test the hypothesis that specific HDL particle subpopulations with particular particle sizes, protein compositions, and functional capacities are associated with a decreased risk of postoperative AKI. We will use NMR, ELISAs, enzymatic activity assays, and cell culture techniques to characterize cardiac surgery patients' HDL throughout the perioperative period, collected in a now completed clinical trial with well documented AKI risk factors and outcomes. Regression analysis will identify HDL particle characteristics independently associated with a decreased risk of postoperative AKI. Our long-term goal is to identify novel methods to enrich or potentiate the identified HDL characteristics and functional capacities associated with a decreased risk of AKI in order to diminish postoperative AKI.