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Abstract
This research focuses on the flow performance evaluation of the centrifugal-flow impeller of a ventricular assist device. To simulate the hemodynamic characteristics of the blood flow, CFX - TASCFLOW software with the finite volume method of analyzing the three-dimensional Reynolds-averaged Navier-Stokes equations is adopted. The numerical results provide not only the flow characteristics for the overall field, but also the data of relationship for flow rate and outflow pressure. In the conceptual design process, hemodynamic study for an initial impeller design is present first and the geometry change is recommended. Three impeller designs are developed and the associated flow rate-head-rotating speed performances are evaluated as well. According to design criterion, the most efficient design has been the one with smooth flow passage, and with low possibility for vortex generation. We suggest the superior design be chosen for further in-vitro test and prepared for the new generation design.
Advisory Committee Hua Chung Shiu - advisor

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