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**Experimental and Computational In Vitro Models of Left Ventricular Fluid Dynamics** ARVIND SANTHANAKRISHNAN, MILAD SAMAEE, Oklahoma State University, JAE HO LEE, AMNEET P. S. BHALLA, BOYCE E. GRIFFITH, University of North Carolina — Computational fluid dynamics (CFD) and fluid-structure interaction (FSI) models of the heart promise to accelerate the design, testing, and regulatory approval of cardiovascular devices, but rigorous validation is required before such models can be used to design, optimize, or test device designs, or to customize patient treatment strategies. Obstacles to validation include difficulties in obtaining high-resolution in vivo data from healthy volunteers and patients and knowledge of in vivo loads and material parameters. In vitro platforms can provide a more controllable approach to obtaining high-resolution experimental data to use in the testing, development, and validation of cardiac and cardiovascular FSI models. We describe an experimental in vitro model of left ventricular fluid dynamics and progress towards using these models to validate computational models of left ventricular fluid dynamics based on the immersed boundary method.

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