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*Computational modeling of chemical transport in blood and plasma flow coupled with a visco-elastic arterial wall model.*

In this work, the chemical transport in blood flow is modeled by coupling the Navier-Stokes equation in cylindrical coordinates with the advection-diffusion equation, also in cylindrical coordinates. Visco-elastic boundary equations for the Navier-Stokes equation are added to the model to simulate arterial wall movement. The chemical of interest is tracked through the blood flow and into the artery wall. The chemical transport model captures the discontinuity in the chemical concentration between the blood flow in the artery and the plasma flow in the arterial wall. The Navier-Stokes equation is solved with an explicit finite difference method to avoid using a nonlinear solution methodology. The advection-diffusion equation is solved with an implicit finite difference method. The additive Schwarz method is used to solve the advection-diffusion equation on the two sub-domains, the blood flow and the plasma flow. The method presented is applied to a model problem and numerical results will be discussed. (Received September 18, 2007)