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Non-invasive quantification of hemodynamics in human choriocapillaries. HUIDAN (WHITNEY) YU[1], ROU CHEN, SENYOU AN[2], Indiana University-Purdue University Indianapolis (IUPUI), JAMES MCDONOUGH, University of Kentucky, BRADLEY GELFAND, School of Medicine, University of Virginia, JUN YAO, China University of Petroleum (East China) — The development of retinal disease is inextricably linked to defects in the choroidal blood supply. However, to date a description of the hemodynamics in the human choroidal circulation is lacking. Through high resolution choroidal vascular network mapped from immunofluorescent labeling and confocal microscopy of human cadaver donor eyes. We noninvasively quantify hemodynamics including velocity, pressure, and wall-shear stress (WSS) in choriocapillaries through mesoscale modeling and GPU-accelerated fast computation. This is the first-ever map of hemodynamic parameters (WSS, pressure, and velocity) in anatomically accurate human choroidal vasculature in health and disease. The pore scale simulation results are used to evaluate porous media models with the same porosity and boundary conditions.

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