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Human spleen and red blood cells IGOR PIVKIN, Università della Svizzera italiana (Lugano), Switzerland, ZHANGLI PENG, University of Notre Dame, USA, GEORGE KARNIADAKIS, Brown University, USA, PIERRE BUFFET, Institut National de la Transfusion Sanguine, France, MING DAO, Massachusetts Institute of Technology, USA — Spleen plays multiple roles in the human body. Among them is removal of old and altered red blood cells (RBCs), which is done by filtering cells through the endothelial slits, small micron-sized openings. There is currently no experimental technique available that allows us to observe RBC passage through the slits. It was previously noticed that people without a spleen have less deformable red blood cells, indicating that the spleen may play a role in defining the size and shape of red blood cells. We used detailed RBC model implemented within the Dissipative Particle Dynamics (DPD) simulation framework to study the filter function of the spleen. Our results demonstrate that spleen indeed plays major role in defining the size and shape of the healthy human red blood cells.

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