Abstract Submitted for the DFD08 Meeting of The American Physical Society

Fluid Characteristics in Abdominal Aortic Aneurysms (AAAs) and Its Correlation to Thrombus Formation RUBING TANG, PINHAS Z. BAR-YOSEPH, JUAN LASHERAS — It has been observed that most large Abdominal Aortic Aneurysms (AAAs) develop an intraluminal thrombus as they progressively enlarge. Previous studies have suggested that the build up of the thrombus may be associated with the altered hemodynamic patterns that arise inside the AAA. We have performed a parametrical computational study of the flow patterns inside enlarging AAA to investigate the possible mechanism controlling the thrombus formation. Pulsatile blood flows were simulated in idealized models of fusiform aneurysms with different dilatation ratios and the effects of shear-activated platelet accumulation and platelet/wall interaction were evaluated based on the calculated flow fields. The platelet activation level (PAL) was determined by computing the integral over time of flow shear stresses exerted over the platelets as they are transported throughout the aneurysm. Our results have shown that the values of PAL in AAAs are in fact smaller than the maximum value obtained in a healthy abdominal aorta. However, we show that the transportation of blood cells towards the wall and the formation of stagnation points on the aneurysm's wall play more significant roles in thrombus formation than PAL.

> Rubing Tang UC, San Diego

Date submitted: 04 Aug 2008

Electronic form version 1.4