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**L R Ritter\*** (lritter@spsu.edu), Southern Polytechnic State University, 1100 S. Marietta Pkwy, D113 Dept. of Mathematics, Marietta, GA 30060, and **A I Ibragimov, J R Walton** and **C J McNeal**. *Stability analysis of a model of atherogenesis: An energy estimate approach.*

Atherosclerosis is a disease of the vasculature that is characterized by chronic inflammation and the accumulation of lipids and apoptic cells in the walls of large arteries. This disease results in plaque growth in an infected artery typically leading to occlusion of the artery. Atherosclerosis is the leading cause of human mortality in the United States, much of Europe, and parts of Asia. In a previous work, we introduced a mathematical model of the biochemical aspects of the disease, in particular the inflammatory response of macrophages in the presence of chemo-attractants and modified low density lipoproteins. Herein, we consider the onset of a lesion as resulting from an instability in an equilibrium configuration of cells and chemical species. We derive an appropriate norm by taking an energy estimate approach and present stability criteria. A bio-physical analysis of the mathematical results is presented. (Received September 04, 2007)