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Nourridine Siewe*, nourridine@aims.ac.za, and **Abdul-Aziz Yakubu, Abhay R Satoskar**
and **Avner Friedman**. *Immune Response to Infection by Leishmania: A Mathematical Model*.

Leishmaniasis is a disease caused by the Leishmania parasites. The injection of the parasites into the host occurs when a sand fly, which is the vector, bites the skin of the host. The parasites, which are obligate, take advantage of the immune system response and invade both the classically activated macrophages (M1) and the alternatively activated macrophages (M2). In this paper we develop a mathematical model to explain the evolution of the disease. Simulations of the model show that, initially, M2 macrophages are dominant over M1 macrophages, but there exists a “switching time” (approximately two months) by which the M1 become dominant. The model also shows that the infection first increases but eventually decreases to a steady state in which only the M1 macrophages and the parasites within them remain as residuals. (Received January 09, 2015)