1014-92-1129 **Rebecca V Culshaw*** (`rculshaw@uttyler.edu`), 3900 University Boulevard, Department of Mathematics, Tyler, TX 75799. *A control-theoretic approach to combining immunotherapy with antiviral treatment for HIV.*

Over the past several years, there has been renewed interest in immune-enhancing therapies for HIV. While antiretroviral treatments act by supporessing viral load, immune-boosting therapy aims to enhance the CD4+ and CD8+ populations as well as to limit the numbers of activated CD4+ cells available as targets for infection. We develop and analyse a differential equations model for the interactions among healthy CD4+ cells, infection level, and the cytotoxic immune response (as represented by CD8+ cells). The treatments are given by two controls. The first suppresses the cellular infection rate and thus viral production. The second aims to increase the specific anti-HIV cytotoxic immune response. The optimality system, including both optimal controls, is characterised using the Maximum Principle, and numerical simulations developed using Sparse Optimal Control Software (SOCS) are presented. (Received September 27, 2005)