1154-92-1761 **Iordanka Panayotova*** (iordanka.panayotova@cnu.edu), 1 Avenue of the Arts, Department of Mathematics, Newport News, VA 23606, and **Nicole Rychagov** (nrychagov@college.harvard.edu), Cambridge, MA 02138. *Modeling the effects of a novel HIV drug on human immune system with differential equations.* Preliminary report.

Human immunodeficiency virus (HIV) destroys a person's immune system by attacking T-cells of the immune system and using them as viral replicating hosts until the immune system is no longer able to fight the infection; therefore, a person infected with HIV is more likely to get other infections that the immune system can't fight efficiently. Currently, there is no medication that allows a person to be cured of HIV, but it can be controlled through antiretroviral therapy (ART). A novel drug didehydro-Cortistain A (dCA) was introduced recently, which targets an HIV protein; blocks reactivation of the viral genome in the cells and locks the HIV virus into a state of latency. The purpose of this study is to model the effects of the novel drug on the HIV infected immune system dynamics in humans by the means of a mathematical model. Using differential equations, different treatment strategies for the disease are investigated and compared to traditional ART. The model shows that with the novel medication, the virus rebounds much slower and to a level that can be managed by the immune system than in the traditional ART treatment. The results of this study support the hypothesis that the novel "block and lock" therapy may be the first step on the road to a 'functional cure' of AIDS. (Received September 16, 2019)