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**Atanaska Dobрева\***, 1607 Sauls St., Unit A, Tallahassee, FL 32308, and **Nick G Cogan** and **Ralf Paus**. *Mathematics-driven insights into the hostile immune system behavior toward hair follicles.*

Alopecia areata is a hair loss disease in which the immune system attacks and kills hair-producing cells, and the hairless lesions are characterized by distinct spatial patterns. I will present an ODE model that reflects the disease dynamics over time in a small cluster of homogeneous follicles. The model describes the behavior of key substances and immune cells involved in the development of alopecia areata, and it incorporates interactions between hair follicles and the immune system. I will also discuss our on-going efforts to construct a PDE model which can capture the characteristic hairless patterns caused by the disease. Time permitting, I will address some results obtained by applying sensitivity analysis to further investigate the qualitative behavior of the models. Our findings indicate that the signaling pathway via the pro-inflammatory messenger protein interferon-gamma is crucial, and this could help in the development of more effective treatment strategies. (Received September 22, 2017)