1125-92-2775 **Katrina Johnson*** (kjohnson@math.utah.edu), 155 S 1400 E ROOM 233, Salt Lake City, UT 84112-0090, and **Frederick R. Adler**. *Understanding Adipocyte Dynamics through Mathematical Modeling.* Preliminary report.

Adipocytes, or fat cells, are responsible for limiting the exposure of other tissues to lipid accumulation by sequestering and storing lipids during the feeding state and providing energy by releasing lipids during the fasting state. Obesity is the expansion of fat mass in response to positive energy imbalance. Fat tissue expands by increasing the size of adipocytes, hypertrophic expansion, and/or the number of adipocytes, hyperplastic expansion. I developed a size structured model to explore the population dynamics of adipocytes. This model is composed of three equations: a logistic ordinary differential equation, a variable coefficient advection-reaction equation, and an integral differential equation. These ordinary and partial differential equations are coupled through the boundary condition, which represents the production of new fat cells, and the variable advection term. The model highlights the dynamics of two potential problems with fat mass expansion that may lead to metabolic syndrome: insufficient production of new fat cells and fat cells with inadequate potential to sequester lipids.

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