1154-VF-2824 **Ivan Ramirez Zuniga*** (ivr3@pitt.edu), Pittsburgh, PA 15206, and **Jonathan E Rubin** (jonrubin@pitt.edu), **David Swigon** (swigon@pitt.edu) and **Gilles Clermont**. *A Data-driven Mathematical Study of the Role of Energy in Sepsis.* Preliminary report.

When pathogens enter the body, a whole cascade of pro and anti-inflammatory reactions occur in which the immune system activates and attempts to eliminate the invaders and prevent an infection. Under normal circumstances, if the initial pathogen load is sufficiently limited, the immune response would satisfactorily eliminate the intruder and the host will become healthy again. However, in some cases, a systemic overreaction of the immune may occur, leading to persistent inflammation, nitric oxide accumulation, tissue damage, organ dysfunction, and possibly death. Such systemic overreaction is called sepsis and it has been found to be associated to lower levels of energy in the form of adenosine triphosphate (ATP) as well as over production of lactate and nitric oxide. In this work we present an extended mathematical model of ordinary differential equations that includes the dynamics of the acute immune response along with the energy requirements to fight an infection as well as typically measured variables in the ICU. We tuned the model with available animal data from a study done on baboons of the species Papio ursinus that were infused with Escherichia coli (E. coli). We compare the outcomes of survivors versus non-survivors and explore the role of energetics in both groups. (Received September 18, 2019)