1125-92-2562 **Brian E Carlson*** (bcarl@umich.edu), 2800 Plymouth Road, NCRC B10/ A126, University of Michigan, Ann Arbor, MI 48109, and **Daniel A Beard**, **Brendan M McCracken**, **Kevin R Ward**, **M Hakam Tiba** and **Jae Hyuk Lee**. *A Combined Experimental and Computational Approach to Characterize Differential Response to Hemorrhagic Shock.*

Treatment of hemorrhagic shock centers around halting bleeding and replacing lost blood volume. However, the differential physiological response of organs during hemorrhage and resuscitation are poorly understood. We used a combined porcine experimental and computational cardiovascular systems model to identify which cardiovascular states relates to a successful resuscitation. In this experimental study eleven animals were hemorrhaged removing 50-55% of blood volume then resuscited with whole blood in amount equal to shed blood. It was found from the experimental observations that baseline blood oxygen extraction (before hemorrhage) correlated well with a full return of cardiovascular function post resuscitation. In the eleven animals, six were found to have an oxygen extraction ration (OER) of less than 30% and five were greater than 30% at baseline. The high OER group showed low peak lactate in the blood and heart rates returning to normal in resuscitation which was indicative of successful resuscitation. The reason for this differential response could not be determined from the measurements alone therefore a lumped parameter cardiovascular system model consisting of a system of 50 ODEs was used to understand the underlying physiological differences between these two groups. (Received September 20, 2016)