

1086-VG-2976      **Shane Ryerson\***, 3222 Verano Place, Irvine, CA 92617, and **German Enciso**. *Ultrasensitivity for Graded Multisite Activation Networks*.

Multisite protein modification is widely recognized as an essential feature of many switch-like dose responses. It is usually assumed that cooperativity is involved, i.e. the ability of one modified site to alter the rate of modification of its neighbors. We make a very different set of assumptions to obtain ultrasensitive behavior, namely that the individual sites are identical and independent of each other, and that the protein activity is an arbitrary increasing function of the number of modified sites. Under these assumptions we provide theoretical estimates of the Hill coefficient of the dose response. Examples are provided along with numerical simulations for biochemical reaction network models of bacterial chemotaxis and the yeast pheromone pathway. (Received September 26, 2012)