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Ardith W El-Kareh and **Leslie B Jones*** (ljones@math.arizona.edu), P.O. Box 245051, University of Arizona, Tucson, AZ 85724, and **Timothy W Secomb**. *Additive damage model for anti-cancer drug combinations.*

Dose-response data for anti-cancer drugs acting in combination on cell lines are routinely used to assess whether further development in animal models or clinical trials is merited. Several mathematical models have been proposed to describe such data, including the Chou-Talalay median effect model, the Syracuse-Greco model, and the White et al surface response model. We present the additive damage model, in which survival relative to controls is described by a cumulative lognormal function of total damage, which is a linear superposition of damage terms for each drug. This reflects the distribution of lethal thresholds of total damage across the cell population. Two key features of the model are saturation effects in the drug concentration, and the difference in heterogeneity of the lethal damage threshold between the two drugs. (Received August 19, 2009)