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Introduction

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INTRODUCTION

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This issue of *Dose-Response* is the second of two issues focusing on the topic of non-linear relationships involving brain physiology, hormones, memory, stress and arousal. As I noted in the introduction to the first issue (*Nonlinearity in Biology, Toxicology and Medicine* 3(1):1-8, 2005), nonlinearities between arousal and behavioral performance have been described throughout an entire century of psychological research. Recent work in the behavioral neuroscience field, as well, has shown that there are non-linear effects of stress and hormones on brain physiology. The seven papers in these two issues have advanced our understanding of non-linearities in psychology and neurobiology, with reviews and original findings describing the complexity with which stress hormones, such as epinephrine and glucocorticoids, influence learning, memory and brain activity. The current issue completes the special theme with papers addressing nonlinear inhibitory processes in neural systems, by Julian F. Thayer, the actions of glucocorticoids on neuronal viability and survival, by István M Ábrahám, Peter Meerlo and Paul G.M. Luiten, the influence of the amygdala on hippocampus-dependent memory, by Irit Akirav and Gal Richter-Levin, and the influence of stress on the U-shaped relationship between corticosterone and hippocampus-dependent memory, by Collin R. Park, Adam M. Campbell, James C. Woodson, Taro P. Smith, Monika Fleshner and David M. Diamond. In summary, the papers in these two special issues have presented a multidisciplinary, integrated approach to many aspects of important, but poorly understood, relations involving non-linearities at the intersection of psychology and neuroscience.

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