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David T Denhardt
Rutgers University, USA

“Stress” can be broadly defined as any event that challenges homeostasis to such an extent that the body and brain cannot respond adequately, thus resulting in maladjusted physiology and behavior. Much of the response is mediated via the HPA (hypothalamus-pituitary-adrenal) axis and results in the production of glucocorticoids and other effector hormones. DNA is compacted into chromatin, the genetic constituent of chromosomes, by complexing with a small family of proteins called histones. A dozen or so enzymes have been characterized recently that can modify nucleotides in the DNA (methylation of certain cytosines, often in CpG islands) and amino acids in histones, usually strategically located lysines near promoter regions, which can be modified by the addition of methyl or acetyl groups. These and other modifications, called marks, have the epigenetic (on top of the genetics) consequence of increasing or decreasing the amount of the protein made by that gene. Several types of RNA molecules can also epigenetically regulate gene expression. These epigenetic regulators will be briefly reviewed. Severe or repeated concussions sustained in contact sports can result in chronic traumatic encephalopathy (CTE), causing prolonged or permanent changes in personality and possibly leading to an early death. Selected research by O Almeida, W Brown, S Horsburgh, and E Lagarde will be briefly discussed to illuminate the epigenetic mechanisms that could contribute to concussion-induced impairments in the quality of life. What is known about the relation between post-concussion syndrome and posttraumatic stress disorder following traumatic brain injury will be summarized.

Biography

David T Denhardt did his undergraduate work in Chemistry from Swarthmore College, USA and earned his PhD in Biophysics from Caltech in 1965. He was a Faculty Member (performing both research and teaching) at Harvard, McGill, University Western Ontario and Rutgers University. He has 250 publications in PubMed in *Molecular and Cell Biology* and *Systems Physiology*. He serves as an Editorial Board Member of many reputed journals.

denhardt@dls.rutgers.edu

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