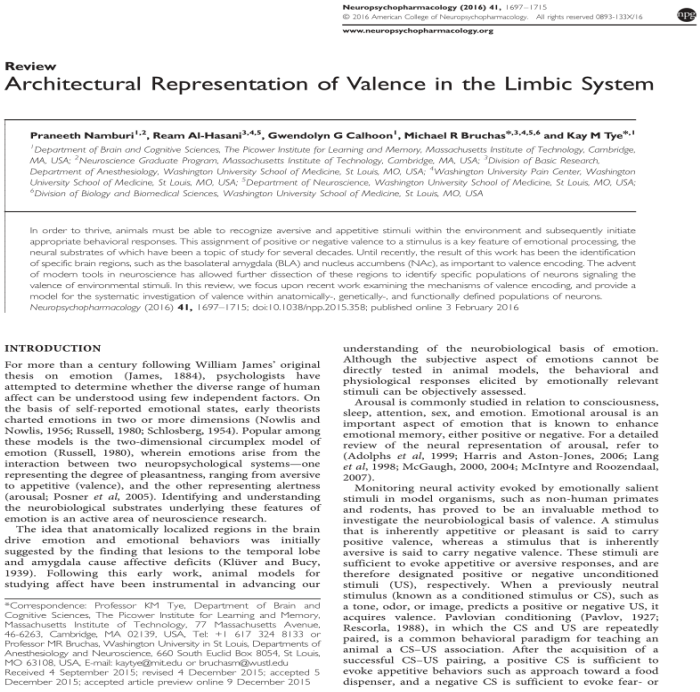
The Neuropharmacological Basis Of Reward



Neuropsychopharmacology (2016) 41, 1697–1715

www.neuropsychopharmacology.org

Review

Architectural Representation of Valence in the Limbic System

Praneeth Namburi[1,2], Ream Al-Hasani[3,4,5], Gwendolyn G Calhoon[1], Michael R Bruchas[*,3,4,5,6] and Kay M Tye[*,1]

[1]Department of Brain and Cognitive Sciences, The Picower Institute for Learning and Memory, Massachusetts Institute of Technology, Cambridge, MA, USA; [2]Neuroscience Graduate Program, Massachusetts Institute of Technology, Cambridge, MA, USA; [3]Division of Basic Research, Department of Anesthesiology, Washington University School of Medicine, St Louis, MO, USA; [4]Washington University Pain Center, Washington University School of Medicine, St Louis, MO, USA; [5]Department of Neuroscience, Washington University School of Medicine, St Louis, MO, USA; [6]Division of Biology and Biomedical Sciences, Washington University School of Medicine, St Louis, MO, USA

In order to thrive, animals must be able to recognize aversive and appetitive stimuli within the environment and subsequently initiate appropriate behavioral responses. This assignment of positive or negative valence to a stimulus is a key feature of emotional processing, the neural substrates of which have been a topic of study for several decades. Until recently, the result of this work has been the identification of specific brain regions, such as the basolateral amygdala (BLA) and nucleus accumbens (NAc), as important to valence encoding. The advent of modern tools in neuroscience has allowed further dissection of these regions to identify specific populations of neurons signaling the valence of environmental stimuli. In this review, we focus upon recent work examining the mechanisms of valence encoding, and provide a model for the systematic investigation of valence within anatomically-, genetically-, and functionally defined populations of neurons.
Neuropsychopharmacology (2016) **41**, 1697–1715; doi:10.1038/npp.2015.358; published online 3 February 2016

INTRODUCTION

For more than a century following William James' original thesis on emotion (James, 1884), psychologists have attempted to determine whether the diverse range of human affect can be understood using few independent factors. On the basis of self-reported emotional states, early theorists charted emotions in two or more dimensions (Nowlis and Nowlis, 1956; Russell, 1980; Schlosberg, 1954). Popular among these models is the two-dimensional circumplex model of emotion (Russell, 1980), wherein emotions arise from the interaction between two neuropsychological systems—one representing the degree of pleasantness, ranging from aversive to appetitive (valence), and the other representing alertness (arousal; Posner *et al*, 2005). Identifying and understanding the neurobiological substrates underlying these features of emotion is an active area of neuroscience research.

The idea that anatomically localized regions in the brain drive emotion and emotional behaviors was initially suggested by the finding that lesions to the temporal lobe and amygdala cause affective deficits (Klüver and Bucy, 1939). Following this early work, animal models for studying affect have been instrumental in advancing our understanding of the neurobiological basis of emotion. Although the subjective aspect of emotions cannot be directly tested in animal models, the behavioral and physiological responses elicited by emotionally relevant stimuli can be objectively assessed.

Arousal is commonly studied in relation to consciousness, sleep, attention, sex, and emotion. Emotional arousal is an important aspect of emotion that is known to enhance emotional memory, either positive or negative. For a detailed review of the neural representation of arousal, refer to (Adolphs *et al*, 1999; Harris and Aston-Jones, 2006; Lang *et al*, 1998; McGaugh, 2000, 2004; McIntyre and Roozendaal, 2007).

Monitoring neural activity evoked by emotionally salient stimuli in model organisms, such as non-human primates and rodents, has proved to be an invaluable method to investigate the neurobiological basis of valence. A stimulus that is inherently appetitive or pleasant is said to carry positive valence, whereas a stimulus that is inherently aversive is said to carry negative valence. These stimuli are sufficient to evoke appetitive or aversive responses, and are therefore designated positive or negative unconditioned stimuli (US), respectively. When a previously neutral stimulus (known as a conditioned stimulus or CS), such as a tone, odor, or image, predicts a positive or negative US, it acquires valence. Pavlovian conditioning (Pavlov, 1927; Rescorla, 1988), in which the CS and US are repeatedly paired, is a common behavioral paradigm for teaching an animal a CS–US association. After the acquisition of a successful CS–US pairing, a positive CS is sufficient to evoke appetitive behaviors such as approach toward a food dispenser, and a negative CS is sufficient to evoke fear- or

*Correspondence: Professor KM Tye, Department of Brain and Cognitive Sciences, The Picower Institute for Learning and Memory, Massachusetts Institute of Technology, 77 Massachusetts Avenue, 46-6263, Cambridge, MA 02139, USA. Tel: +1 617 324 8133 or Professor MR Bruchas, Washington University in St Louis, Departments of Anesthesiology and Neuroscience, 660 South Euclid Box 8054, St Louis, MO 63108, USA. E-mail: kaytye@mit.edu or bruchasm@wustl.edu
Received 4 September 2015; revised 4 December 2015; accepted 5 December 2015; accepted article preview online 9 December 2015

The contributors, all prominent physiological psychologists or behavioral pharmacologists, have extensively analysed current research on drugs, brain neurotransmitters, and reinforcement in animals. They present convergent evidence that implicates the nucleus accumbens and its.This is the first comprehensive volume devoted to recent studies of the biological basis of reinforcement. The contributors, all prominent physiological.Topics in experimental psychopharmacology, 1. The neuropharmacological basis of reward. New York, NY, US: Clarendon Press/Oxford University Press.The Neuropharmacological Basis of Reward (Topics in Experimental Psychopharmacology): Medicine & Health Science Books.The Neuropharmacological Basis of Reward. Sparber Sheldon Ph.D. The Journal of Nervous and Mental Disease: November - Volume - Issue The Neuropharmacological Basis of Reward. Blackman Derek. Behavioural Pharmacology: June - Volume 2 - Issue 3 - ppg Book reviews: PDF.The Neuropharmacological basis of reward / edited by Jeffrey M. Liebman and Steven J. Cooper. Other Authors. Liebman, Jeffrey M. Cooper, S. J.. Published.The Neuropharmacological basis of reward. Responsibility: edited by Jeffrey M. Liebman and Steven J. Cooper. Imprint: Oxford [Oxfordshire]: Clarendon Press.Contributors ix. 1 Introduction. 1. Jeffrey M. Liebman. 2 Pharmacological basis of intracranial self-stimulation reward. James R. Stellar and Mathew B. Rice.18 Feb - 18 sec Best Price The Neuropharmacological Basis of Reward (Topics in Experimental.2 May - 7 sec Read here skiathosmemories.com?book=[PDF] The.All drugs of abuse produce elevations in brain reward thresholds during acute withdrawal [43], .. The neuropharmacological basis of reward.Drugs of abuse: anatomy, pharmacology and function of reward pathways. that brain reward systems have a multidetermined neuropharmacological basis that.rats that set the basis for the characterization of the reward circuitry. They demonstrated .. (eds): The Neuropharmacological Basis of Reward. Gloucestershire.These results suggest that brain reward systems have a multidetermined neuropharmacological basis that may involve some common neuroanatomical.Neuropharmacology is the study of how drugs affect cellular function in the nervous system, To better understand the basis behind drug development, one must first . Alcohol's rewarding and reinforcing (i.e., addictive) properties are mediated through its effects on dopamine neurons in the mesolimbic reward pathway.Toward a Molecular Basis of Alcohol Use and Abuse pp Cite as and amygdala is hypothesized to be the focus for the neuropharmacology of alcohol.Neural and Neurochemical Bases of Reward and Action. A. Discovery of J. Neurochemistry and neuropharmacology of reward systems. K. Relation of.Molecular Neuropharmacology: A Foundation for Clinical Neuroscience, . and anatomic basis, and naturally intended function, of the reward circuitry in the.

[PDF] The Words Of Jeremiah
[PDF] The Cambridge Introduction To Anglo-Saxon Literature
[PDF] Facing The Future With Hope: Cycle B Sermons For Advent, Christmas, And Epiphany Based On The Gospel
[PDF] The Other Islands Of New York City: A History And Guide
[PDF] Voices Of Diversity: Stories, Activities, And Resources For The Multicultural Classroom