Editorial

Introduction to AIMS Neuroscience Special Issue "What Function Does the Anterior Insula Play in Human Cognition?"

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A key contribution of neuroscience is an understanding of how different brain regions and systems implement the cognitive processes that underlie behavior. The anterior insula is a particularly challenging region to understand in humans for a variety of reasons including recent evolutionary changes that limit the role of studies in other animals as well as the multimodal nature of the insula [1]. Progress in understanding the insula will require multiple methodological approaches including neuropsychological and neuroimaging studies. Give this challenge, AIMS Neuroscience is pleased to present this special issue entitled "What function does the anterior insula play in human cognition?" The special issue consists of two main articles and one associated commentary.

In the first article, Tomasino and colleagues [2] present a neuropsychological study of patients with insula tumors. This research includes both pre- and post-surgical testing demonstrating some interesting laterality differences between the functions of the left and right insula. Their discussion of the evidence highlights the difficulties of studying this multimodal area adjacent to a number of important white matter tracts. In the second article, Pavuluri and May [3] present a review of insula function including an overview of the anatomical connectivity of the anterior, middle, and posterior insula. They have made connections with a number of clinical studies highlighting the potential role of the insula as a biomarker for the treatment of a number of illnesses. Concluding the issue is a commentary by Sepede and colleagues [4] who also point out the potential use of insula activity as a marker for disease.

The research reported in this issue pulls together a significant amount of the recent literature on insula function in addition to highlighting the need for more integrative theories of anterior insula function. The anterior insula is a key node in the brain's salience network that has undergone recent

evolutionary changes [1,3]. It is clear that the salience network plays a role in both cognitive control and emotion processing [1,5], but the exact function of the anterior insula is unclear. The results of Tomasino and colleagues [2] highlight the fact that the left insula seems more related to cognitive tasks than the right insula. The relative activity of the left and right insula may indeed be dependent on the types of cognitive processes that are being monitored by the salience network. For example, research using a visuospatial monitoring task consistently finds bilateral activation of the anterior insular cortex as part of the brain's cognitive control network [6], but language tasks that require cognitive control show left-lateralized insula activity [7]. There is a clear need for more detailed models of the cognitive processes underlying the variety of tasks that activate the insula, and the research presented in this special issue provides a significant contribution toward advancing theories of anterior insula function.

Conflict of Interest

The author declares no conflicts of interest in this paper.

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