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Reduction of Higher-Order Occipital GABA and Impaired Visual Perception in Acute Major Depressive Disorder

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A complicated state-dependent psychiatric ailment called major depressive disorder (MDD) lacks biomarkers that relate psychophysical, physiological, and psychopathological alterations. The relevance and significance of GABA for higher-order visual perception are still unknown, despite earlier research showing reduced GABA in lower-order occipital cortex in acute MDD. By integrating a psychophysical analysis of visual perception with a measurement of GABA concentration in the middle temporal visual area (hMT+) in acute depressive MDD, our work aims to close that gap. A large sample of individuals with acute MDD show a highly specific deficiency in visual surround motion suppression, which is crucially correlated with the severity of symptoms. The smaller MDD sample that underwent MRS replicates both the visual deficiency and its relationship to the severity of the symptoms. Acute MDD sufferers show lower GABA concentration in visual MT+ using high-field 7T proton magnetic resonance spectroscopy (1H-MRS), which, unlike in healthy people, no longer corresponds with their ability to perceive motion, or poor SI. Overall, the results of our combined psychophysical and biochemical study show that diminished occipital GABA plays a significant role in altered visual perception and psychopathological symptoms in acute MDD. Our findings highlight the significance of the occipital cortex in acute depressive MDD, including its potential as a possible biomarker, by bridging the gap from the biochemical level of occipital GABA over visual-perceptual changes to psychopathological symptoms.

Biography

Xue Mei Song received his doctorate from the Shanghai Institute of Biological Science, Chinese Academy of Science in 2007. From 2007 to 2010 she worked at the Shanghai Institute of Biological Science as a research assistant, and from 2010 to 2015 she worked there as an associate investigator. Her research using in vivo single-unit recording and juxta-cellular labelling revealed that all labelled contrast-dependent (CD) cells were pyramidal cells, whereas all labelled contrast-independent (CID) cells were non-pyramidal cells, CIDf cells were spiny satellates, and CIDs cells were smooth interneurons. In addition, she showed how smooth and spiny nonpyramidal cells differ from one another in terms of their summation features. Dr. Song began working as an Associate Professor at Zhejiang University's (Ziint) Interdisciplinary Institute of Neuroscience and Technology in September 2015.