Special issue: potential therapeutic targets involving 5-HT6 and 5-HT7 receptors

Serotonin or 5-hydroxytryptamine (5-HT) has a long history in scientific investigation, ranging from gastrointestinal, feeding, and cardiovascular functions to migraine and emotional and pain problems. 5-HT has multiple receptors, and particularly, the 5-HT6 and 5-HT7 receptors have been shown to be involved in functions and dysfunctions of the central nervous system and have become targets in many laboratories around the world. This special issue of *Reviews in the Neurosciences* (Rev. Neurosci.) addresses some important physiological, pathophysiological, and potential therapeutic applications of 5-HT6 and 5-HT7 receptors, including sleep regulation, depression, stress, and memory, among others.

Although there are few 5-HT6 receptor-related patents, when all patents are grouped according to the different subtypes of serotonin receptors, 5-HT6 receptors represent 9.47% of the total (see Ruiz and Oranias Olsina, 2010); thus, the 5-HT6 receptor is the fourth target of interest after 5-HT1A, 5-HT2A, and 5-HT1D. When specifically searching for “5-HT6 receptor ligands” and their mechanism of action, 271 different patent families are retrieved (Ruiz and Oranias Olsina, 2010). 5-HT6 receptors have been implicated in the control of memory processes, but in terms of patents, diseases such as depression, obesity, psychosis, pain, and Alzheimer’s disease are also important. Moreover, the growing interest in the 5-HT7 receptor is evidenced by the enlarging range of focuses and approaches, including the synthesis of radioligands, agonists, and antagonists and studies linking these receptors to stress, schizophrenia, age-related memory impairment, sleep, and wakefulness. Other potential areas of interest include addiction, neurotransmission systems (Costa et al., 2012; Pehrson and Sanchez, 2013), intracellular pathways (Gellynck et al., 2013; Seyedabadi et al., 2014), immune responses, and intestinal inflammation (Kim et al., 2013). Thus, the 5-HT6 and 5-HT7 receptors represent a new horizon waiting to be studied with regard to their functions and dysfunctions as well as their therapeutic applications. We hope that the present reviews are successful in showing that 5-HT6 and 5-HT7 receptors modulate different functions, and by this, provide new clues in neuroscience research that encourage new lines of investigation.

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