

3rd International Conference on Medicinal Chemistry & Computer Aided Drug Designing

December 08-10, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Amphetamine derivatives crossing through the serotonin transporter: A molecular simulation study

Angélica Fierro¹, Karen Brunel¹ and Gerald Zapata-Torres²

¹Pontificia Universidad Católica de Chile, Chile

²University of Chile, Chile

Neurotransmitter Transporters (NTT) are transmembrane proteins responsible for maintaining the control of neurotransmitter concentration in the synaptic space. They use ion gradients of Na⁺, Cl⁻ and K⁺ and an internal negative membrane potential to transport its substrates through the membrane. One of them, the Serotonin Transporter (SERT) is the macromolecule in charge of reuptake the neurotransmitter serotonin (5-HT), from the extra- towards the intracellular space. Changes on 5-HT concentration levels are related with psychiatric and neurodegenerative disorders, entailing SERT as a key target in medicinal chemistry. However, although several groups are nowadays studying NTT's transporter mechanism, it still remains elusive. The crystal structures of both Leucine Transporter (LeuT) and the more recently one for the Dopamine Transporter (DAT) were used as templates to obtain insights of structural determinants of NTT. In our work, we have studied the main interactions occurring in SERT in complex with serotonin (5-HT), Amphetamine (AMPH), Methamphetamine (MAMPH), 3, 4-Methylenedioxyamphetamine (MDA) and 3, 4-Methylenedioxy-Methamphetamine (MDMA) in order to shed light on the interactions that underlie the transport process. Our findings reveal a similar transport mechanism for serotonin and all amphetamine derivatives used in this study. In addition, our findings are in agreement with experimental results described in literature.

Biography

Angélica Fierro has completed his PhD at the age of 33 years from University of Santiago de Chile and Postdoctoral studies from University of Chile. At present, she works as Assistant Professor in Pontificia Universidad Católica de Chile. Her interests are focused in neurochemistry and Computational Chemistry. She has published around 20 papers and one book chapter, most of them related with the monoaminergic system.

afierroh@uc.cl