## **D-Serine**

D-Serine, synthesized in the brain by serine racemase from L-serine (its enantiomer), serves as a neuromodulator by coactivating NMDA receptors, making them able to open if they then also bind glutamate. D-serine is a potent agonist at the glycine site (NR1) of the NMDA-type glutamate receptor (NMDAR). For the receptor to open, glutamate and either glycine or D-serine must bind to it; in addition a pore blocker must not be bound (e.g. Mg2+ or Pb2+).

1/1

In fact, D-serine is a more potent agonist at the glycine site on the NMDAR than glycine itself.

D-serine was thought to exist only in bacteria until relatively recently; it was the second D amino acid discovered to naturally exist in humans, present as a signalling molecule in the brain, soon after the discovery of D-aspartate. Had D amino acids been discovered in humans sooner, the glycine site on the NMDA receptor might instead be named the D-serine site.

Apart from central nervous system, D-serine plays a signaling role in peripheral tissues and organs such as cartilage, kidney and corpus cavernosum.

Improved synaptic function in the absence of EphB3 results from attenuation in CCI injury-induced synaptic losses and reduced d-serine levels compared with WT injured mice. Together, these findings suggest that EphB3 signaling plays a deleterious role in synaptic stability and plasticity after TBI<sup>1)</sup>.

Enhanced astrocytic d-serine underlies synaptic damage after traumatic brain injury <sup>2)</sup>.

1)

Perez EJ, Cepero ML, Perez SU, Coyle JT, Sick TJ, Liebl DJ. EphB3 signaling propagates synaptic dysfunction in the traumatic injured brain. Neurobiol Dis. 2016 Oct;94:73-84. doi: 10.1016/j.nbd.2016.06.007. Epub 2016 Jun 16. PubMed PMID: 27317833.

Perez EJ, Tapanes SA, Loris ZB, Balu DT, Sick TJ, Coyle JT, Liebl DJ. Enhanced astrocytic d-serine underlies synaptic damage after traumatic brain injury. J Clin Invest. 2017 Jul 17. pii: 92300. doi: 10.1172/JCI92300. [Epub ahead of print] PubMed PMID: 28714867.

From: https://neurosurgerywiki.com/wiki/ - Neurosurgery Wiki

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=d\_serine

Last update: 2024/06/07 02:53

