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## **Nongenomic actions of neurosteroid pregnenolone and its metabolites.**

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### **Abstract**

Steroids have been widely used in the clinical setting. They bind and activate nuclear receptors to regulate gene expression. In addition to activating genomic transcription, steroids also exert nongenomic actions. The current article focuses on the nongenomic actions of neurosteroids, including pregnenolone (P5), 7 $\alpha$ -hydroxypregnenolone, pregnenolone sulfate and allopregnanolone. Pregnenolone and its derivatives promote neuronal activity by enhancing learning and memory, relieving depression, enhancing locomotor activity, and promoting neuronal cell survival. They exert these effects by activating various target proteins located in the cytoplasm or cell membrane. Pregnenolone and its metabolites bind to receptors such as microtubule-associated proteins and neurotransmitter receptors to elicit a series of reactions including stabilization of microtubules, increase of ion flux into cells, and dopamine release. The wide actions of neurosteroids indicate that pregnenolone derivatives have great potential in future treatment of neurological diseases.

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**KEYWORDS:** CLIP-1; Depression; Microtubule; Neurodegeneration; Neurosteroid; Pregnenolone

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