

Progesterone signaling mechanisms in brain and behavior. ^[1]

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Abstract

Steroid hormone, progesterone, modulates neuroendocrine functions in the central nervous system resulting in alterations in physiology and behavior. These neuronal effects are mediated primarily by intracellular progesterin receptors (PRs) in the steroid-sensitive neurons, resulting in transcription-dependent genomic actions (classical mechanism). In addition to progesterone, intracellular PRs can also be activated in a "ligand-independent" manner by neurotransmitters, peptide growth factors, cyclic nucleotides, and neurosteroids. Recent studies indicate that rapid, non-classical progesterone actions involving cytoplasmic kinase signaling and/or extranuclear PRs can result in both transcription-independent and transcription-dependent actions. Cross-talk between extranuclear and classical intracellular signaling pathways promotes progesterone-dependent behavior in mammals. This review focuses on the mechanisms by which progesterone-initiated signaling mechanisms converge with PRs in the brain to modulate reproductive behavior in female rodents.

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