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Cell Biology

An expressible antidepressant-sensitive serotonin transporter

Value Proposition

Serotonin-targeting antidepressants are now prescribed for a wide spectrum of disorders, including obsessive-compulsive disorder, depression, as well as eating, sleep, and panic disorders. Next generation therapeutic strategies to combat these disorders, and to treat patients for which current therapies are ineffective, will require robust new research and animal models.

Technology

This invention is a 2.28 kb cDNA clone from rat brain encoding a serotonin transporter and was isolated from a rat brainstem cDNA library. When cloned into an appropriate expression plasmid and transfected into nonneuronal cells (HeLa fibroblasts), the cDNA clone produces a functional serotonin transporter with high specificity for serotonin over other monoamine neurotransmitters such as dopamine and norepinephrine. Transport of serotonin in transfected cells is dependent upon extracellular sodium and is blocked by tricyclic antidepressants in a manner identical to that observed for serotonin transport in vivo.

Other Applications

Parts of this clone technology can be used to:

- Construct chimeric molecules with novel functions
- Correct genetic mutations
- Remove the endogenous transporter by targeted deletions

The cDNA clone or parts of the molecule, in normal or mutated form, could also be transferred into the germ line of transgenic animals to establish animal models for disorders relating to serotonin uptake, secretion, or metabolism.

Advantages

- No known clones have previously been isolated
- Experiments using this clone could prove valuable in the management of neurological disorders

