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 ASSIGNMENT

Describe in details the synthesis of two named neurotransmitters.

**Small molecule neurotransmitters ( ACETYLCHOLINE)**

They are synthesized locally within the axon terminal. Some of the precursors necessary for the synthesis of these molecules are taken up by selective transporters on the membrane of the terminal. Others are byproducts of the cellular processes that take place within the neuron itself and are thus readily available. The enzymes necessary to catalyse an interaction among these precursors are usually produced in the cell body and transported to the terminal by slow axonal transport.

**ACETYLCHOLINE** is an example of an excitatory small molecule neuro transmitter. This important, well studied neuro transmitter, made up of choline acetate is found at various locations throughout the central and peripheral nervous systems and at all neuromuscular junctions. The synthesis of acetylcholine requires the enzyme choline actyltransferase and like all small molecule transmitters takes place within the nerve terminal.

**NEUROPEPTIDES (ENDORPHINS)**

These are the second category of neurotransmitters. They differ in both sixe and the way of synthesis. They range from 3 to 36 amino acids in length. Their synthesis require peptide bond formation. Neuropeptides synthesis is very much like the synthesis of any secretory protein made by the cell. First within the cell nucleus, gene transcription takes place, during which a specific peptide coding sequence of DNA is used as a template to construct a corresponding strand of messenger RNA. The m RNA then travels to a ribosome, where the process of translation begins. During translation, the sequence of nucleotides that make up the m RNA act as a code to string together a corresponding sequence of amino acid that will eventually become the neuropeptide needed at the terminal. Before this molecule can be transported to the terminal for release into the synaptic cleft, it must be processed in the endoplasmic recticulum packaged in the golgi apparatus and transported in storage vesicles down the axon to the terminal.