Peptides and Psychiatry, Part 1: How Synthesis of Neuropeptides Differs From Classical Neurotransmitter Synthesis

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Issue: *Neuropeptides and their receptors are increasingly targets for novel psychotropic drugs. Synthesis, storage, and release of the neuropeptides differ in important ways from these same processes for the classical monoamine neurotransmitters.*

This is the first of a 3-part series on peptides and psychiatry. Part 1 is a visual lesson on molecular aspects of how these interesting neurotransmitters are synthesized, stored, and released. Part 2 will appear in the February 1999 BRAINSTORMS and will explore a very exciting family of neuropeptides with potentially important therapeutic activities, namely the tachykinins, also called neurokinins, of which substance P is the best known example. Part 3 will appear in the March 1999 BRAINSTORMS and will review interesting developments with substance P antagonists as novel antidepressants in a visual feature called "Substance P and Serendipity: Novel Psychotropics Are a Possibility."

REFERENCES

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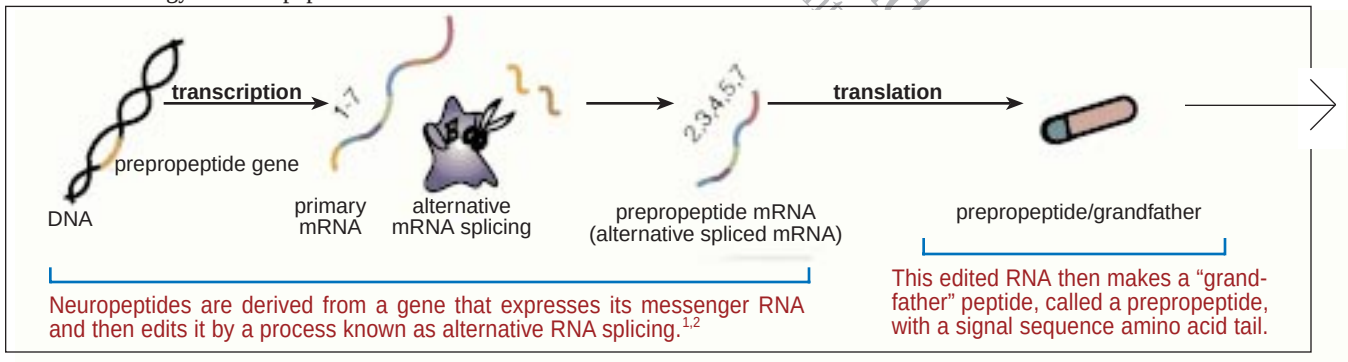
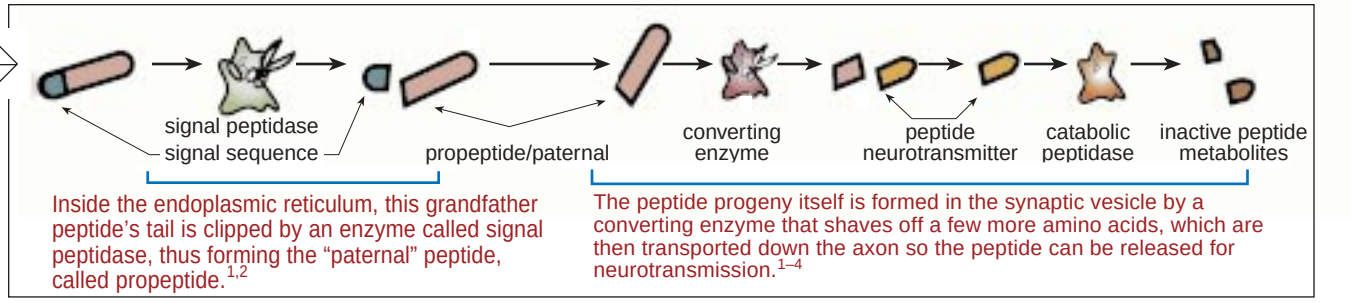
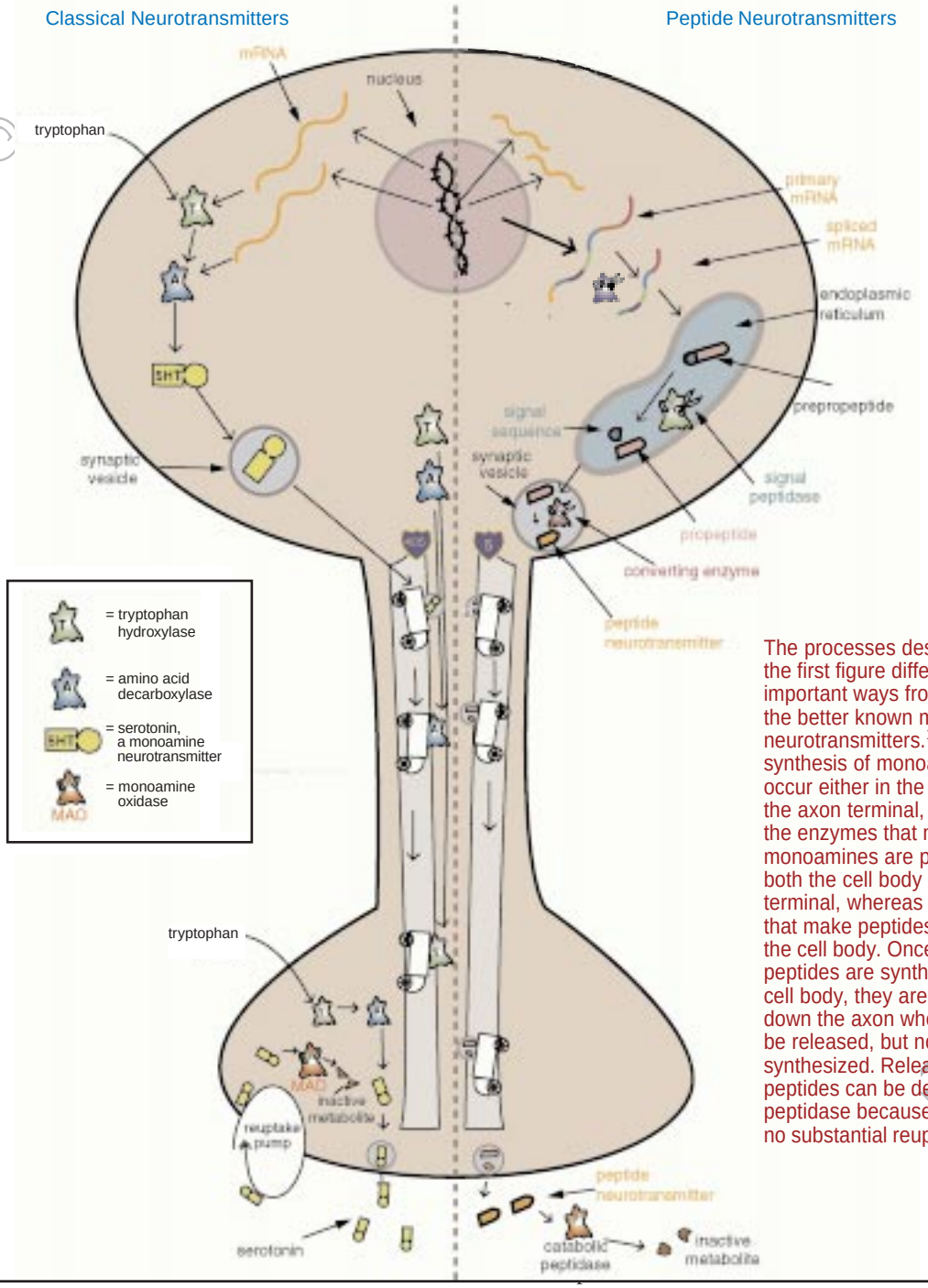
Molecular Biology of Neuropeptides





Synthesis of Classical vs. Peptide Neurotransmitters



The processes described in the first figure differ in several important ways from those of the better known monoamine neurotransmitters.[1–4] That is, synthesis of monoamines can occur either in the cell body or the axon terminal, because the enzymes that make monoamines are present in both the cell body and nerve terminal, whereas enzymes that make peptides are only in the cell body. Once the peptides are synthesized in the cell body, they are transported down the axon where they can be released, but not reused or synthesized. Released peptides can be destroyed by peptidase because there exists no substantial reuptake pump.

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