

## Endocrine System: Biochemistry, Secretion and Transport of Hormones

1. Place the following hormones into one of the three categories of hormones (peptides, amines or steroids): T<sub>4</sub> (thyroxin), estradiol, norepinephrine, insulin, aldosterone, glucagon, cortisol, growth hormone, T<sub>3</sub> (triiodothyronine), epinephrine, testosterone and vasopressin (ADH).

Peptides	Amines	Steroids

2. Peptide hormones are synthesized as large precursor hormones called \_\_\_\_\_. The hormones (or prohormones) are stored in \_\_\_\_\_ and released from the cell by \_\_\_\_\_. Do peptide hormones require a carrier in the blood stream?
3. Catecholemines are produced in the \_\_\_\_\_ of the adrenal gland and are classified as \_\_\_\_\_ hormones since they are derived from \_\_\_\_\_. Stimulation of the chromaffin cells causes an influx of \_\_\_\_\_ ions, which causes the vesicles to merge with the plasma membrane and release the hormone by \_\_\_\_\_. Are catecholemines water-soluble or lipid-soluble?
4. Thyroid hormones include two molecules called \_\_\_\_\_ and \_\_\_\_\_. T<sub>3</sub> consists of two \_\_\_\_\_ molecules plus \_\_\_\_\_ iodine molecules and is (more or less) abundant than T<sub>4</sub>. Are carriers required for the transport of thyroid hormones?
5. All steroid hormones are derived from \_\_\_\_\_, which steroid hormone is produced is determined by the \_\_\_\_\_ present in the cell. The common precursor molecule for all steroid hormones is \_\_\_\_\_. Steroid hormones enter the blood stream by \_\_\_\_\_ and \_\_\_\_\_ (do or do not) require a carrier. The rate of secretion of steroid hormones is (faster or slower) than catecholemines because steroid hormones are not \_\_\_\_\_.
6. Preganglionic sympathetic fibers trigger the release of \_\_\_\_\_ and \_\_\_\_\_ (hormones) from the \_\_\_\_\_ (gland), this is an example of neural regulation of hormone secretion.
7. Two examples of hormonal regulation of hormone secretion include: 1) the negative feedback of T<sub>3</sub> & T<sub>4</sub> to decrease \_\_\_\_\_ levels; and 2) the negative feedback of cortisol which decreases both \_\_\_\_\_ and \_\_\_\_\_ levels.
8. Besides increased levels of plasma glucose and amino acids (humoral regulation), increased levels of both \_\_\_\_\_ (hormone) and the \_\_\_\_\_ nervous system increase plasma insulin levels.
9. Some hormones are released in rhythmic 24 hour patterns know as \_\_\_\_\_ rhythms. \_\_\_\_\_ is a hormone where stressful stimuli can override this pattern and increase the plasma

hormone levels. In contrast, \_\_\_\_\_ hormones (amine hormones) are an example where large amounts of the hormones are bound to carrier proteins in the plasma forming a large circulating reservoir. Thus, acute changes do not produce large changes in the plasma level of this hormone.

10. The \_\_\_\_\_ and \_\_\_\_\_ are the major organs that metabolize hormones. The type of hormone determines how fast they are metabolized. \_\_\_\_\_ and \_\_\_\_\_ are rapidly metabolized, while \_\_\_\_\_ and \_\_\_\_\_ take longer to metabolize.