

Section 13.2: Review Answers

Student Textbook page 450

1. Tropic hormones are hormones that stimulate endocrine glands to release other hormones. Human growth hormone is considered a tropic hormone because it is released by the anterior pituitary into the blood, where it travels to the liver and stimulates the liver to secrete hormones called growth factors.
2. The overproduction of human growth hormone causes gigantism and acromegaly. Gigantism is the result of the overproduction of human growth hormone during

childhood. Acromegaly is the result of the overproduction of human growth hormone after the individual reaches adulthood.

3. Note: Some students may be aware that the releasing hormone in this situation is also known as TRH (thyrotropin-releasing hormone).

Label	Description	Effects
A	more releasing hormone is secreted	stimulates the anterior pituitary gland to secrete TSH
B	more thyroid-stimulating hormone (TSH) is secreted	the anterior pituitary responds to increased levels of releasing hormone by releasing more TSH into the blood
C	more thyroxine is secreted	in response to increasing TSH, the thyroid gland secretes more thyroxine
D	less releasing hormone is secreted	increased levels of thyroxine in the blood exert negative feedback on the hypothalamus, resulting in lower levels of releasing hormone
E	less TSH is secreted	lowers levels of releasing hormone reduce the levels of TSH produced by the anterior pituitary
F	less thyroxine is secreted	lower levels of TSH result in lower production of thyroxine by the thyroid gland

4. An overactive thyroid produces an excess of thyroxine, resulting in hyperthyroidism. Since thyroxine stimulates metabolism, which releases stored energy as ATP, the symptoms of hyperthyroidism include anxiety, insomnia, heat intolerance, an irregular heartbeat, and weight loss. (Note: Weight loss and constant hunger are the result of the “burning off” of calories that occurs with high levels of thyroxine.)
5. One of the by-products of a nuclear power plant explosion is the release of radioactive iodine. In the human body, iodine is quickly swept up by the thyroid, so that the total intake of radioactive iodine becomes concentrated there. The thyroid has a maximum uptake of iodine, however, so some protection against radioactive iodine releases can be afforded by taking iodine (potassium iodide) tablets to load up the thyroid to capacity so that radioactive iodine would be more likely to be excreted.

6. The hGH treatment might help her because hGH stimulates the growth of muscles, connective tissue, and growth plates at the end of the long bones, which causes the elongation of these bones.
7. Students’ answers should include a listing of the advantages and disadvantages. They may also differentiate between the treatment of age-related health problems and anti-aging treatments that are done more for cosmetic than health improvement reasons. Their answer should reflect an opinion on using hGH to counteract the effects of aging.