Part II: The Powerful Pituitary

In Part I of the case, you learned that Lincoln most likely has a problem with his pituitary gland, specifically a tumor in the anterior region. Although not much bigger than a raisin, the pituitary gland releases a total of nine hormones, many of which trigger other endocrine glands to secrete hormones of their own. The pituitary gland monitors body function and sends signals to other organs and glands to make adjustments and to maintain a proper internal environment.

1. Take out your endocrine system graphic organizer.
2. Use colored pencils or markers to draw and label the glands, target organs and hormones you have investigated in Lincoln’s case. Begin with the pituitary gland. Use the same format you used to draw on the organizer in Activity 2.3.1. Make sure to draw an arrow from the gland to the target organs and write the name of the hormone along the arrow.
3. Research two additional hormones of the pituitary gland. Add these hormones to your graphic organizer.
4. Work with your partner to design and build a pituitary gland on your Maniken®. Use yellow clay to build this organ.
5. Research the connection between the pituitary gland and the hypothalamus, another structure in the brain. The hypothalamus and the pituitary form the chief link between the nervous and the endocrine system. Take notes in your laboratory journal.
6. Use Inspiration to create a feedback loop or diagram that shows how the body regulates the level of thyroid hormones in the body (and thus maintains normal metabolism). This loop or diagram should include the pituitary gland and the hypothalamus as well as the names of important hormones. Make sure to show how hormones exert feedback to maintain proper thyroid function. Draw arrows to and from important glands and hormones. Think about how the levels of one hormone may impact the release (or lack thereof) of another hormone.
7. Refer back to your blood glucose feedback loop from Activity 2.3.1 for ideas on how to organize your thinking and to design your loop. However, as long as you can explain your diagram, you are free to use whatever format you feel displays a clear relationship between the glands and demonstrates the idea of feedback.
8. Work with your partner to design and build a thyroid gland on your Maniken®. Use pink or red clay to build this gland.
9. Answer the conclusion questions.

Conclusion

1. Describe an example that illustrates this statement: “Some hormones control the release of other hormones.”
2. The pituitary gland is often called the “control center of the endocrine system.” Why do you think this is an appropriate title?
3. Explain how Lincoln’s endocrine system disorder affected other body systems.
4. Explain the role the hypothalamus plays in regulating hormone action.