Cell Communication Kit

By Science Take-Out

Use the Science Take-Out kit to answer these questions in your notebook.

1. What parts of your model represents signal molecules?
2. Receptors are proteins on the plasma membrane of the receiving cell that bind with signal molecules. What parts of the receiving cell model represents receptors?
3. Which color bead represents a specific signal that is recognized by the receiving cell? Explain your answer.

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4. What causes the pancreas to release insulin?
5. What part of the model represents insulin hormone molecules?
6. Which cell (sending or receiving) represents a pancreas cell that secretes insulin?
7. What body system carries insulin from the pancreas to other cells in the body?

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8. What part of your model represents insulin receptors?
9. How do target cells detect the presence of insulin in the bloodstream?
10. In your model, the pink and green beads represent other types of hormone signal molecules. Explain why the insulin receptors cannot detect the presence of these hormone molecules.

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11. Looking at the sheet in the kit entitled "Change in Receiving Cell Function," which diagram represents what happens in ALL body cells when insulin binds to the insulin receptors?
12. Which diagram represents what happens in liver and muscle cells when insulin binds to the receptors?
13. Which diagram represents what happens in adipose cells when insulin binds to the receptors?

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14. Describe how you could change your model to represent what happens in a person with Type 1 diabetes.
15. Describe how you could change your model to represent what happens in a person with Type 2 diabetes.
16. Why might Type 2 diabetes be more difficult to treat than Type 1 diabetes?

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17. What causes the sending neuron to release the neurotransmitter molecule?
18. Explain why information can only pass in one direction across the synapse?
19. Which diagram on the "Changes in Receiving Cell Function" sheet represents what happens when neurotransmitters bind to the receptors on neurons?

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20. What part of your model represents natural endorphins?
21. Find the bag labeled "For Part 6" in your lab kit. Which pieces from this bag would best represent opiate drugs? Explain why you selected these pieces.

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22. How could you change your model to illustrate how Botox paralyzes the muscles that cause wrinkles?
23. Find the bag labeled "For Part 6," and permanently block the tiny cups with the small sponges to represent these antibodies. Explain why Myasthenia Gravis causes muscle paralysis.