Regulating Blood Sugar

10.3

Vocabulary

islets of Langerhans

Textbook pp. 483–487

MAIN IDEA: The islets of Langerhans in the pancreas secrete insulin, which lowers the blood glucose level, and glucagon, which raises the blood glucose level. The balance of insulin and glucagon regulates the concentration of glucose in the blood.

1. For each function of the pancreas in **Table 1** below, identify the source of the function and describe each process. K/U C

Table 1 Functions of the Pancreas

Function	Source	Process
secretion of digestive enzymes		
lower blood sugar levels		
raise blood sugar levels		

2. You eat a meal with a high sugar content. Explain how each factor below will respond and why. K/U T/I
   (a) blood sugar

   (b) alpha cells

   (c) beta cells

3. You have not eaten a meal after several hours of exercise. How will each factor below respond and why? K/U T/I
   (a) blood sugar

   (b) alpha cells

   (c) beta cells

STUDY TIP

Review Prior Learning
Insulin and glucagon are part of negative feedback mechanisms. Review negative feedback mechanisms in Chapter 9 and in Section 10.1.

MAIN IDEA: Diabetes mellitus is a disease in which the blood glucose level is not properly regulated due to a failure of insulin production or action. Type 1 diabetes is caused by an inability to produce insulin, due to a failure of beta cells in the islets of Langerhans. It tends to develop during childhood. Type 2 diabetes is caused by insulin insufficiency and/or by the inability of cells to respond correctly to insulin. It tends to develop during adulthood, often as a result of obesity.

5. Draw a flow chart to illustrate how diabetes can result in excess thirst. K/U C

6. Describe three serious effects of diabetes. K/U

7. Complete **Table 2** to compare type 1 and type 2 diabetes. K/U C

Table 2 Diabetes Comparison

	Type 1 Diabetes	Type 2 Diabetes
Onset		
Possible cause(s)		
Most effective treatments		
Possibility of cure		

8. Why do you think more intensive treatment is often required to manage type 1 diabetes than type 2 diabetes? T/I