Anatomy & Physiology 12

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| **Homeostasis Worksheet** | Name:Block:Date: |

1. Describe the difference between negative and positive feedback.
2. State whether each of the following indicates negative or positive feedback:
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If blood temperature rises too high, specialized neurons in the hypothalamus of the brain sense the change. These neurons signal other nerve centers, which in turn send signals to the blood vessels of the skin. As these blood vessels dilate, more blood flows close to the body surface and excess heat radiates from the body.
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If the blood temperature falls to low, specialized neurons in the hypothalamus of the brain sense the change and signals are sent to the cutaneous arteries (those supplying the skin) to constrict them. Warm blood is then retained deeper in the body and less heat is lost from the surface.
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Part of the complex biochemical pathway of blood clotting is the production of an enzyme that forms the matrix of the blood clot. This is a self-catalytic or self-accelerating effect, so that once the clotting process begins, it runs faster and faster until, ideally, bleeding stops.
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ During childbirth stretching of the uterus triggers the secretion of the hormone oxytocin, which stimulates uterine contractions and speeds up labor.
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The walls of arteries stretch in the presence of high blood pressure. Baroreceptors located in these walls also stretch and as a result, a signal is sent to the brain, which in turn slows down the body’s heart rate. This slows the flow of blood through the arteries casing less pressure. As blood pressure drops the baroreceptors become flaccid and a signal is sent to speed up the heart rate.
3. Draw and describe the correct sequence for the homeostatic process.
4. During lactation (milk production), the suckling by the baby stimulates the production of oxytocin, which in turn causes contraction of smooth muscle surrounding the milk duct, causing milk to flow. The flow of milk increases the suckling by the baby and more oxytocin is produced.
	1. Identify the feedback system described above. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. What would end the feedback loop? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Draw and label a flow chart of the feedback system for the release of oxytocin.
5. Rising blood sugar levels after a meal normally triggers insulin secretion, which in turn causes glucose to be converted to glycogen for storage. Draw a negative feedback loop describe this process.
6. What is the homeostatic state (normal) for:
	1. Blood pH
	2. Blood Pressure
	3. Body Temperature
7. How is homeostasis important for the maintenance of life?

For the following graphs always graph time on the horizontal (X) axis. Label your axis!

1. A patient’s body temperature was recorded over a 24-hour period; the temperature at each hour is listed in the table below. Graph the data in the space provided and state whether it indicates negative or positive feedback.



|  |  |
| --- | --- |
| **Time** | **Temp. °F** |
| 12 am | 98.30 |
| 3 am | 98.10 |
| 6 am | 98.40 |
| 9 am | 98.90 |
| 12 pm | 98.70 |
| 3 pm | 98.50 |
| 6 pm | 98.60 |
| 9 pm | 98.80 |

Type of Feedback: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A man with heart disease has his blood pressure monitored closely.



|  |  |
| --- | --- |
| **Time** | **BP mm Hg** |
| 7 am | 200 |
| 8 am | 190 |
| 9 am | 170 |
| 10 am | 150 |
| 11 am | 130 |
| 12 pm | 110 |
| 1 pm | 70 |

Type of Feedback: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Recognize normal parameters:

* The normal range for blood glucose is 70-110 m/dl
* The normal range for blood pH is 7.35-7.45
1. A woman is being tested for diabetes mellitus. Her blood glucose is measured over a period of time.



|  |  |
| --- | --- |
| **Time** | **Blood Glucose m/dl** |
| 0 | 100 |
| 1 hour later | 120 |
| 2 hours later | 110 |
| 3 hours later | 90 |
| 4 hours later | 80 |
| 5 hours later | 85 |

Type of Feedback: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does the patient always remain within the normal range? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does the patient have any apparent problems with glucose regulation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A man with kidney problems is being watched for acid base imbalance.



|  |  |
| --- | --- |
| **Time** | **pH** |
| 7 am | 7.45 |
| 9 am | 7.46 |
| 12 pm | 7.44 |
| 1 pm | 7.42 |
| 6 pm | 7.39 |
| 8 pm | 7.37 |
| 10 pm | 7.38 |
| 12 am | 7.40 |
| 3 am | 7.42 |

Type of Feedback: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does the patient always remain within the normal range? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does the patient have any apparent problems with acid base balance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_