

## **EXPERIMENT-8**

**Aim:** To demonstrate positive and negative feedback mechanism.

**Requirements:** cotton swab, 70% alcohol or any other suitable antiseptic solution, clinical thermometer, glass slide, cover slip, scanning electron microscope.

Theory:

Homeostasis is maintenance of equilibrium in the body's internal environment by constant interaction of its regulatory mechanisms. One of these regulatory mechanisms is a feedback system which controls the normal physiological parameters. A feedback system includes a receptor, a control center and an effector cell/organ as basic components. A receptor recognises the changes in the controlled body environment and sends corresponding inputs to the control center for interpretation. Effector cell/organ receives output from the control center and accordingly produces the response to balance the altered physiology.

Feedback mechanism can either be positive or negative. Positive feedback mechanism occurs when change in the parameter triggers a response that causes changes in the same direction whereas, in negative feedback mechanism, a stimulus causes an opposite output reversing the initial change in order to maintain the normal level of the parameter to be regulated.

When we exercise, negative feedback mechanism works. The following parameters change during exercise:

1. Increased oxygen demand by muscles.
2. Increased heart rate and pulse rate.
3. Increased blood pressure.
4. Increased body temperature.
5. Change in the pH of blood.

During haemostasis, positive feedback mechanism works. The following changes occur when the blood vessel is injured:

1. Aggregation of platelets at the injured site.
2. Release of specific chemicals by platelets to attract more platelets.
3. Initiates the activation of clotting factors.
4. Formation of fibrin clot i.e. coagulation.

Procedure:

### **A. Demonstration of negative feedback mechanism:**

1. Select a subject and ask him/her to get relaxed for 5 minutes by taking rest before starting the experiment.
2. Record pulse rate, heart rate, blood pressure and body temperature using standard procedures
- 3 Record the breathing rate by counting respiration cycles per minute.

4. Prick the ring finger under aseptic condition. Take a drop of blood on pH indicator paper and check the pH range of blood,
5. Ask the subject to perform any of the following exercises for 3 minutes: (I) running in place with thighs brought up horizontally, (II) hopping on each foot, (III) climbing the stairs up and down, (iv) jogging.
6. Record pulse rate, heart rate, blood pressure, body temperature, breathing rate and blood pH immediately after completion of this exercise.
7. Ask the subject to relax for 30 minutes and record all the parameters again.

**B. Demonstration of positive feedback mechanism:**

1. Select a subject and prick his/her ring finger under aseptic condition.
2. Take a blood drop on the clean glass slide.
3. Dip one end of the pricking needle in the blood drop and drag it up.
4. Repeat the step no. 3 until the formation of fibrin clot is observed.
5. Observe this process using scanning electron microscope under 3000X objective lens and take the micrographs.

**Observation: In this experiment, We have studied about positive and negative feedback mechanism.**

Sl.No	Parameter	Before Exercise	Immediately Exercise	30 Minutes after exercise
1	Pulse rate (beats/minute)			
2	Heart rate (beats/minute)			
3	Blood pressure (systolic/diastolic mm Hg)			
4	Body temperature (°F)			
5	Breathing rate (cycles/minute)			
6	Blood pH			