

THE SKIN

The hairs on the skin also help to control body temperature. They lie flat when we are warm, and rise when we are cold. The hairs trap a layer of air above the skin, which helps to insulate the skin against heat loss.

The **hypothalamus** is the part of the brain which monitors the body's temperature. It receives information from temperature-sensitive **receptors** in the skin and circulatory system.

The hypothalamus responds to this information by sending nerve impulses to effectors to maintain body temperature. For example, if we become too cold, the hair erector muscles contract. This raises the skin hairs and traps a layer of air next to the skin.

Negative feedback mechanisms control body temperature. They include the amount of:

- shivering (rapid muscle contractions release heat)
- sweating (evaporation of water in sweat causes cooling)
- blood flowing in the skin capillaries

VASOCONSTRICTION AND VASODILATATION

The amount of blood flowing through the skin capillaries is altered by vasoconstriction and vasodilation.

	TOO COLD	TOO HOT
Process	Vasoconstriction	Vasodilation
Arterioles	Get narrower	Get wider
Blood flow in skin capillaries	Decreases	Increases
Heat loss from skin	Decreases	Increases

REGULATING BLOOD GLUCOSE

Glucose is needed by cells for **respiration**. It is important that the concentration of glucose in the blood is maintained at a constant level. **Insulin** is a hormone - produced by the pancreas - that regulates glucose levels in the blood.

	LOW GLUCOSE	HIGH GLUCOSE
Effect on pancreas	Insulin not secreted into the blood	Insulin secreted into the blood
Effect on liver	Does not convert glucose into glycogen	Converts glucose into glycogen
Effect on blood glucose level	Increases	Decreases

Plant and Animal Hormones

HORMONES AND NERVES

A **hormone** is a chemical substance, produced by a **gland** and carried by the blood, which alters the activity of more specific **target organs** (and is then destroyed by the liver).

