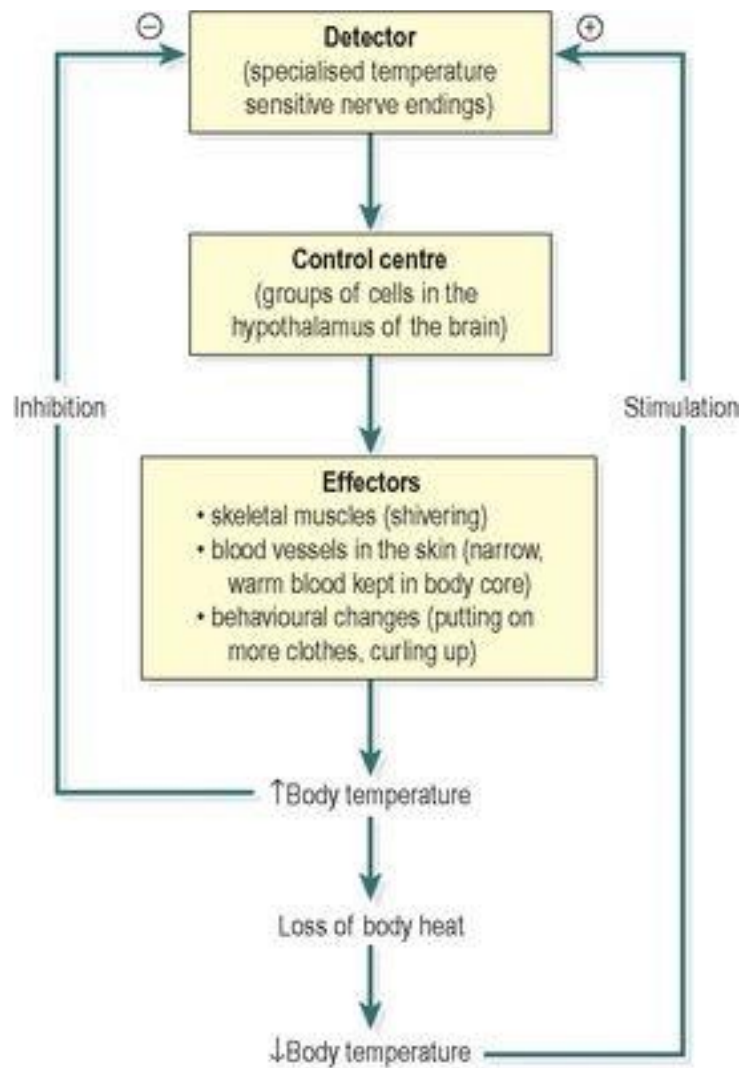


**Homeostasis:** The composition of the internal environment is tightly controlled, and this fairly constant state is called homeostasis. Literally, this term means ‘unchanging’, but in practice it describes a dynamic, ever-changing situation kept within narrow limits. When this balance is threatened or lost, there is a serious risk to the well-being of the individual. It is regulated by feedback mechanisms

**Examples of physiological variables:** Core temperature Water and electrolyte concentrations pH (acidity or alkalinity) of body fluids Blood glucose levels Blood and tissue oxygen and carbon dioxide levels Blood pressure.



**Fig: Negative feedback mechanism:** control of body temperature.

Homeostasis is maintained by control systems that detect and respond to changes in the internal environment. A control system has three basic components: detector, control centre and effector. The control centre . determines the limits within which the variable factor should be maintained. It receives an input from the *detector*, or sensor, and integrates the incoming information. When the incoming signal indicates that an adjustment is needed, the control centre responds and its output to the *effector* is changed.

### Positive feedback mechanisms

There are only a few of these *cascade* or *amplifier* systems in the body. In positive feedback mechanisms, the stimulus progressively increases the response, so that as long as the stimulus is continued the response is progressively amplified. Examples include blood clotting and uterine contractions during labour.

During labour, contractions of the uterus are stimulated by the hormone *oxytocin*. These force the baby's head into the cervix of the uterus, stimulating stretch receptors there. In response to this, more oxytocin is released, further strengthening the contractions and maintaining labour. After the baby is born the stimulus (stretching of the cervix) is no longer present so the release of oxytocin stops.