

Introduction to Physiology

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Volume 3 Control Mechanisms

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Contents

The control of the body temperature. Thermoregulatory responses. Nervous mechanisms in thermoregulation. Neuro-humoral aspects of thermoregulation. Behaviour. Adrenal and thyroid glands. *Supplement I* The skin. *Supplement II* Structure and function of the thyroid gland. **The control of the vascular circulation.** The sensory mechanisms. Effector mechanisms and efferent pathways. Central mechanisms. Some cardiovascular reflexes. Effects of humoral agents. Cardiovascular adjustments in exercise. Cardiovascular adaptation to haemorrhage. Coronary blood flow. Pulmonary blood flow. **Control of respiration.** Brain-stem neurones. The respiration motor neurones. Respiratory reflexes. Frequency and depth of respiration. The integrated breathing pattern. The respiratory response to exercise. Adaptation to high altitudes. **Control mechanisms in the alimentary process.** The digestive processes. Gastric digestion. Intestinal digestion. Some hormone interactions. Salivary secretion. Swallowing. Gastric digestion. Intestinal digestion. Some hormone interactions. Electrical activity. The large intestine. The rectum and anus. **Homeostasis of the blood composition.** Salt and water balance. The blood pH. Potassium. Magnesium. Calcium. Phosphate. Diuresis and saluresis. The blood sugar. **Homeostasis in the nervous system.** The cerebrospinal fluid and the blood brain barrier. Cerebral blood flow. **Bibliography.** **Subject index.**

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The nervous system. Control mechanisms. The nervous system. Axonal propagation of the message. Neuro-effector transmission. Skeletal neuromuscular transmission. Transmission to the nervous system. The autonomic system. **Hormonal control.** Hormones. The pituitary gland. Binding of hormones to carrier proteins. Assay of hormones. The "second messenger": cyclic AMP. Hormonal control of transport. Prostaglandins. The fate of hormones. The adrenal gland. **The effector systems.** Contraction of skeletal muscle. Energy aspects of muscle contractions. Structural basis of contraction. Activation and contraction of cardiac muscle. Activation and contraction of smooth muscle. Mechanical basis of muscle tone. The secretory cell. **The cells of the blood and the response to injury.** Protective mechanisms. The blood cells. Haemopoiesis. The response to injury. Haemostasis. The immune response. The role of the thymus. **Reproduction and lactation.** Reproduction. Lactation. **Bibliography.** **Subject index.**

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