**Animal Form and Function**:

Ch. 40

Arrangement:

Single celled organism:

Multicelled organisms:

Animalia:

**Tissues**:

Tissue:

Epithelial tissue:

Simple epithelium:

Stratified epithelium

Cuboidal cell:

Columnar cell:

Squamous cell:

Connective tissue:

Collagenous fibers:

Elastic fibers:

Loose connective tissue:

Fibrous connective tissue:

Tendon:

Ligament:

Adipose tissue:

Bone: support

Osteoblast:

Osteoclast:

Blood:

Muscle tissue:

Skeletal muscle:

Cardiac muscle:

Intercalated disk:

Smooth muscle:

Nervous tissue:

Neuron: (nerve cell) tissue

Structure:

**Organ systems**:

Organ:

Organ system:

Thoracic cavity:

Abdominal cavity:

Mesentery:

Diaphragm:

Digestive system:

Circulatory system:

Respiratory system:

Excretory system:

Immune system:

Endocrine system:

Reproductive system:

Nervous system:

Integumentary system:

Skeletal system:

Muscular system:

**Sustain form and function**:

**Bioenergetics**:

**(Fig 40.7)**

Bioenergetics:

Cellular respiration:

Glycolysis:

CTA cycle:

Oxidative phosphorylation, chemiosmosis:

**Metabolic rate**:

Metabolic rate:

Measured:

Strategies:

Endothermic:

Ectothermic:

Influences:

Size:

Activity:

Basal metabolic rate:

Standard metabolic rate:

Other factors:

Energy costs:

**(Fig 40.10)**

**Regulation of internal environment**:

Interstitial fluid:

Homeostasis:

Human:

Fluctuations:

Regulator:

Conformer:

Freshwater fish:

Homeostatic control system:

Receptor:

Control center:

Effector:

Negative feedback loop:

Positive feedback loop:

**Thermoregulation**:

Thermoregulation:

**(Fig 40.12)**

Ectotherms:

Endotherms:

Heat exchange: **(Fig 40.13)**

Conduction:

Convection:

Radiation:

Evaporation:

**Balance heat exchange**:

Insulation: hair,

Integumentary system:

Epidermis: dead epithelial cells

Dermis:

Hypodermis:

Circulatory adaptation:

Vasodilatation:

Vasoconstriction:

Countercurrent exchange:

Evaporative heat loss:

Behavioral response:

Metabolic heat production:

Nonshivering thermogenesis:

Brown fat:

**(Fig 40.20)**

**Feedback mechanisms**: **(Fig 40.21)**

**Adjust to temperature change**:

Acclimatization:

Endotherms:

Heat-shock proteins:

Ectotherms: