

INKBIOLOGY FLASHCARDS

Animal transport and cardiovascular biology

Unit B09 · 29 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in mark-scheme wording, and the misconceptions that lose marks. These cards and each lesson's whole-lesson check run on the website with spaced-repetition scheduling, at inkphysics.co.uk/biology/flashcards.

DEFINITION

Define: Mass transport system.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Surface area to volume ratio.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Metabolic rate.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Atrioventricular valves.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Semilunar valves.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Tendinous cords.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Coronary arteries.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Myogenic.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The exchange surface available per unit of volume; it falls as an object gets larger.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

A system in which substances are moved in bulk, in a fluid driven by a pump, over distances too great for diffusion to serve.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The valves between each atrium and its ventricle; tricuspid on the right, bicuspid or mitral on the left.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The rate at which an organism uses energy, and so the rate at which it must be supplied with oxygen and relieved of carbon dioxide.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Inelastic strands running from the atrioventricular valve flaps to papillary muscles projecting from the ventricle wall. The muscles tense as the ventricle contracts, so ventricular pressure cannot turn the flaps inside out; the pressure does the opening and shutting, the cords only stop the flaps going too far.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The valves at the base of the aorta and the pulmonary artery, preventing backflow into the ventricles.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Contracting from within the muscle itself, without needing a nerve impulse to initiate the beat.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The vessels branching from the base of the aorta that supply the heart muscle itself with oxygenated blood.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Sinoatrial node.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Atrioventricular node.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Purkyne fibres.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

SPOT THE ERROR

Say what is wrong with this claim:

Valves open and close because muscle pulls them open and shut.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Define: Hydrostatic pressure.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

Define: Oncotic pressure.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

Define: Tissue fluid.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

Define: Lymph.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

The only electrical connection between atria and ventricles; it delays the impulse so the atria empty first.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The patch of tissue in the right atrium wall that sets the rhythm of the heart.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

SPOT THE ERROR

Nothing pulls a valve: there is no muscle attached to the free edge of one. A valve moves when the fluid on one side pushes harder than the fluid on the other, so every valve movement in the cycle follows a pressure difference.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

Conducting fibres running from the bundle of His up through the ventricle walls, so contraction begins at the apex.

THE HEART AND THE CARDIAC CYCLE: PRESSURE DECIDES EVERYTHING

DEFINITION

The inward pull created by plasma proteins, which stay in the capillary and lower the water potential of the blood relative to the tissue fluid. Also called colloid osmotic pressure.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

The physical pressure the blood exerts against the capillary wall, pushing fluid out through the gaps between endothelial cells.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

Tissue fluid that has drained into the lymphatic system; similar to tissue fluid but containing lymphocytes and more fatty acids after a meal.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

The fluid surrounding cells, formed by ultrafiltration from capillaries; it is very poor in plasma protein, though not literally protein-free, and has no red blood cells and no platelets.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

Define: Lymph node.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

SPOT THE ERROR

Say what is wrong with this claim:

Arteries carry oxygenated blood and veins carry deoxygenated blood.

DEFINITION

Define: Conjugated protein.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Prosthetic group.

DEFINITION

Define: Partial pressure of oxygen.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Percentage saturation.

DEFINITION

Define: Bohr shift.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Loading.

SPOT THE ERROR

Artery means carrying blood away from the heart, which is a statement about direction and not about cargo. The pulmonary artery carries deoxygenated blood and the pulmonary vein oxygenated blood, and the umbilical vessels break the pattern the same way round.

BLOOD VESSELS AND TISSUE FLUID: WHAT LEAKS OUT AND WHAT COMES BACK IN

DEFINITION

A swelling in a lymph vessel where lymphocytes collect and pathogens in the lymph are removed.

DEFINITION

The non-protein component; in haemoglobin, the haem group with its iron(II) ion.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

A protein with a non-protein prosthetic group permanently associated with it.

DEFINITION

The proportion of the oxygen-binding sites on haemoglobin that are actually occupied.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

The contribution oxygen makes to the total pressure of a gas mixture, measured in kPa; a measure of how much oxygen is present.

DEFINITION

Association of oxygen with haemoglobin, at the gas exchange surface.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

The rightward shift of the oxygen dissociation curve caused by an increased partial pressure of carbon dioxide and the fall in pH that goes with it, so that oxygen dissociates more readily at any given partial pressure.

DEFINITION

Define: Unloading.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Carbonic anhydrase.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Chloride shift.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Define: Haemoglobinic acid.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

SPOT THE ERROR

Say what is wrong with this claim:

The Bohr shift means that in an exercising person, haemoglobin picks up less oxygen at the lungs.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

The enzyme in red blood cells catalysing the reversible reaction between carbon dioxide and water to form carbonic acid.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Dissociation of oxygen from haemoglobin, at respiring tissue.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

Haemoglobin that has taken up hydrogen ions, buffering the contents of the red blood cell.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

DEFINITION

The movement of chloride ions into a red blood cell as hydrogencarbonate ions move out, maintaining electrical neutrality.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS

SPOT THE ERROR

The Bohr shift changes unloading, not loading. At the roughly 12 kPa found in the lungs the shifted curve has already flattened and saturation is still above 90 per cent. It is at the steep part of the curve that the shift releases much more oxygen.

HAEMOGLOBIN: AN S-SHAPED CURVE AND EVERYTHING IT EXPLAINS