Surface Area to Volume Ratio

1 2 3 4 5

Single Celled Organism

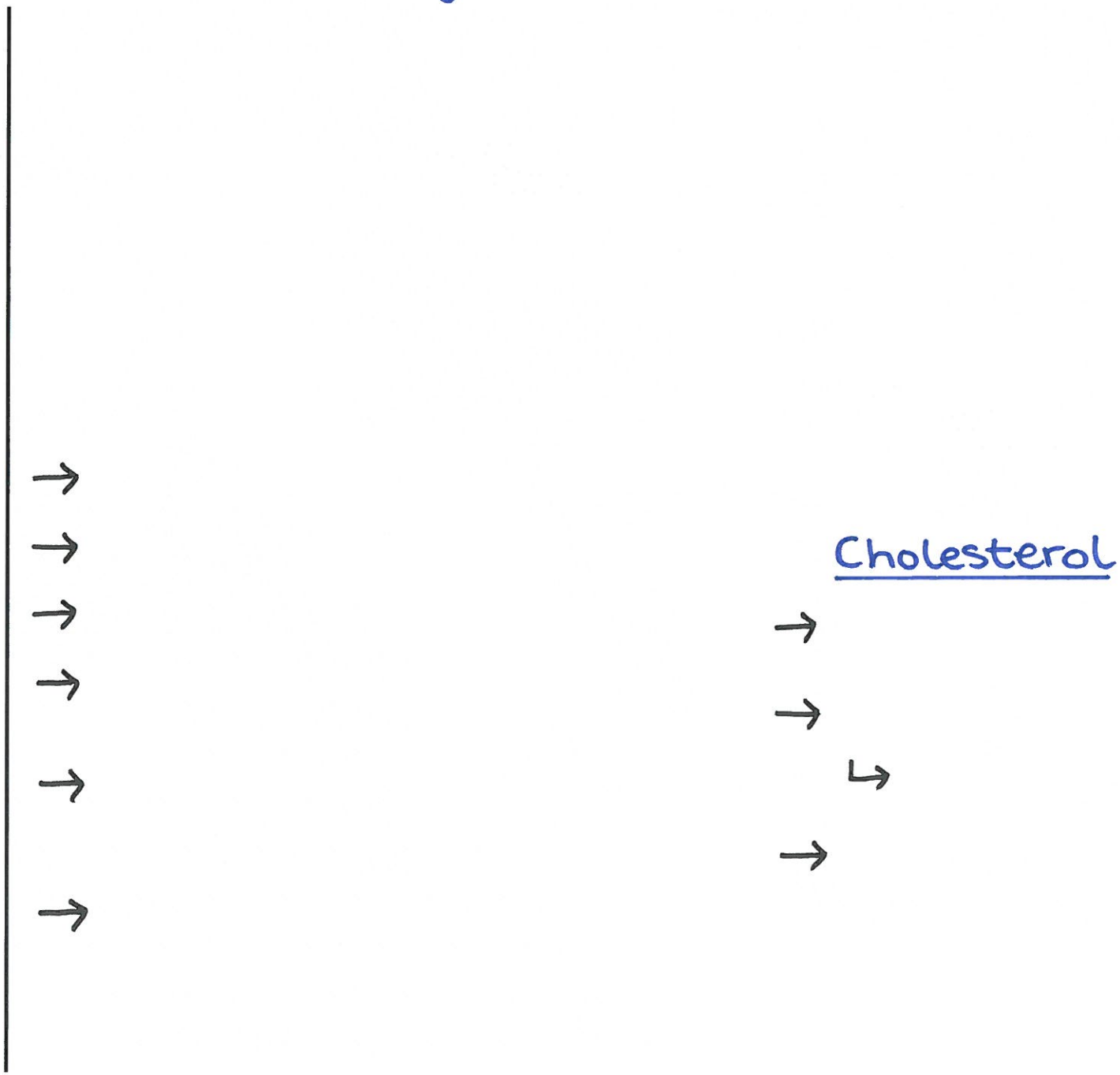
Flatworm

Small Mammal

Big Mammal

Cell-Surface Membranes

1 2 3 4 5



Gas Exchange in Humans

1 2 3 4 5

TT

Short Diffusion Pathway

Alveoli

Ventilation

Circulation

Structure:

Adaptations for Efficient Gas Exchange

Surface Area: →

→

→

→

⇨

Diffusion Distance:

→

→

⇨

Concentration Gradient:

→

→

→

⇨

Transport Across Membranes - Diffusion

1 2 3 4 5

TT

Diffusion

_____ :

→

A B

① Concentration Gradient

→

↳

② Diffusion Distance

→

→

③ Surface Area

→

→

Exam Question

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↳

→

↳

→

Fick's Law of Diffusion

$= \quad \times \quad \times \quad \frac{\qquad}{\qquad}$

Example

CO_2 conc^n inside cell =

CO_2 conc^n outside cell =

Surface area of cell =

Thickness of membrane =

Permeability constant =

Transport Across Membranes: Facilitated Diffusion

1 2 3 4 5

TT

Facilitated Diffusion

_____ _____ :

Protein Channels

Carrier Proteins

Active Transport

→

→

↳

Both

→

→

→

Transport Across Membranes: Active Transport & Co-Transport

1 2 3 4 5

TT

Active Transport

Co-Transport

TT

Transport Across Membranes: Exocytosis & Endocytosis

1 2 3 4 5

Exocytosis

_____ :

_____ :

_____ _____

① ② ③ ① ② ③

Endocytosis

→ →

→ →

→ →

→ →

→ →

→ →

Transport Across Membranes - Osmosis

1 2 3 4 5

TT

Osmosis

_____ :

_____ _____ _____ _____ _____ _____

High water Potential

Low water Potential

Exam Question

→

→

→

TT TOP TIP

Water potential is opposite to solute concentration