

ورقة عمل الهيكل الوزاري



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف الثاني عشر العام ← علوم ← الفصل الأول ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 17-03-2025 19:30:05

ملفات اكتب للمعلم اكتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل
منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

المزيد من مادة
علوم:

إعداد: أدهم زوين

التواصل الاجتماعي بحسب الصف الثاني عشر العام



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف الثاني عشر العام والمادة علوم في الفصل الأول

مراجعة نهائية شاملة وفق الهيكل الوزاري منهج انسابير الخطة M101

1

حل مراجعة نهائية وفق الهيكل الوزاري

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أسئلة الامتحان النهائي القسم الالكتروني للعام 2020-2021

3

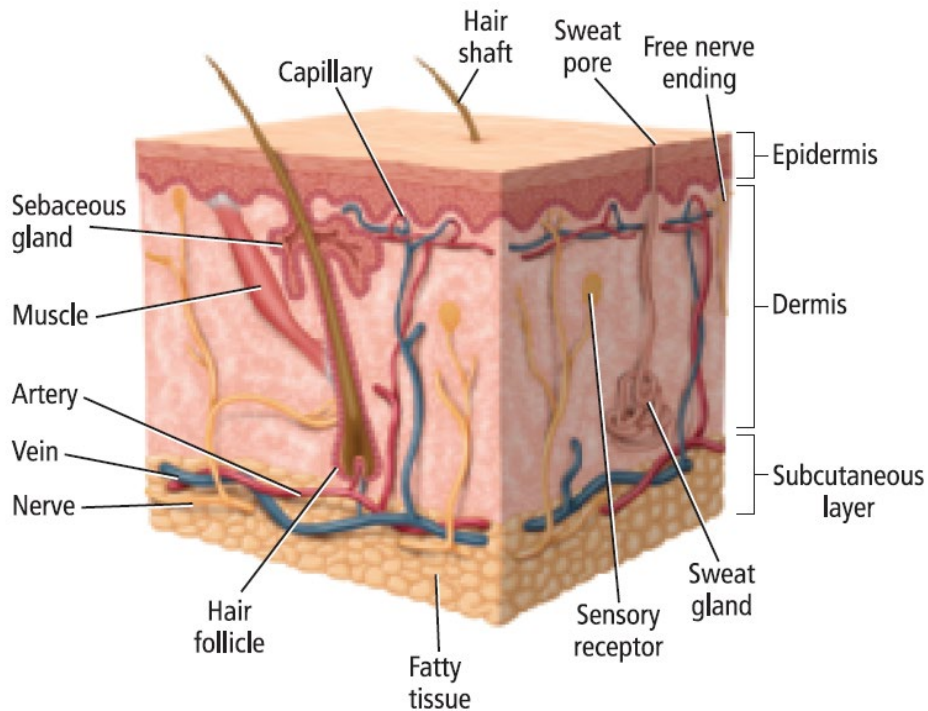
مراجعة نهائية وفق الهيكل الوزاري

4

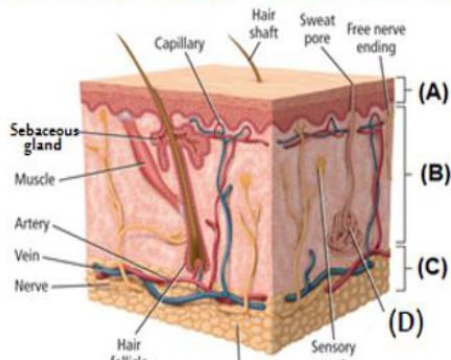
تجميع أسئلة مراجعة وفق الهيكل الوزاري منهج بريدج الخطة M

5

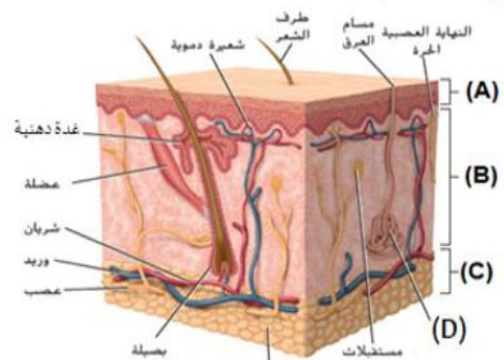
Biology G12 Term 2 -EOT 2- 2025



The figure shown below illustrates the two main layers of skin as seen through a microscope. Study it and then answer the question: **which letter of the following refers to the site that stores fat and helps the body retain heat?**



يظهر الشكل أدناه الطبقتين الأساسيتين للجلد عند رؤيتهما من خلال المجهر، تمنعه جيداً ثم أجب عن السؤال: **أي حرف مما يلي يشير إلى الموقع الذي يخزن الدهون ويساعد الجسم على حفظ درجة الحرارة؟**



A

B

C

D

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Which are **not** found in the dermis?

أي مما يلي **غير** موجود في الأدمة؟

- (a) Sweat and oil glands
- (b) Muscles
- (c) Nerve cells
- (d) Fat cells

1. Which of the following is **NOT** a function of the integumentary system?

- a) Protection of internal organs
- b) Production of blood cells
- c) Regulation of body temperature
- d) Sensory reception

2. Which type of tissue makes up the **outermost** layer of skin?

- a) Connective tissue
- b) Muscle tissue
- c) Epithelial tissue
- d) Nerve tissue

3. What is the primary function of **keratin** in the epidermis?

- a) It provides pigmentation to the skin
- b) It stores fat and helps in heat retention
- c) It waterproofs and protects underlying cells and tissues
- d) It enables skin to return to its normal state after stretching

4. Which layer of skin contains cells that produce melanin?

- a) Outer epidermis
- b) Inner epidermis
- c) Dermis
- d) Subcutaneous layer

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5. What is the function of melanin in the skin?

- a) To keep the skin hydrated
- b) To protect deeper cells from ultraviolet (UV) radiation
- c) To produce keratin for waterproofing
- d) To regulate sweat production

6. Which of the following best describes the relationship between melanin production and UV exposure?

- a) Melanin production decreases when exposed to sunlight
- b) UV exposure stimulates increased melanin production
- c) UV exposure destroys melanin, leading to lighter skin tone
- d) Melanin production is independent of UV exposure

7. Which of the following is **TRUE about the dermis?**

- a) It is thinner than the epidermis
- b) It consists mostly of muscle fibers
- c) It contains connective tissue, nerve cells, and glands
- d) It does not play a role in temperature regulation

8. Why is the dermis considered **essential for the skin's strength and flexibility?**

- a) It is 15–40 times thicker than the epidermis
- b) It consists of only epithelial cells
- c) It contains oil glands that prevent skin from stretching
- d) It is responsible for the production of new skin cells

9. Which structure in the skin helps **regulate body temperature by releasing **sweat**?**

- a) Sebaceous glands
- b) Sweat glands
- c) Hair follicles
- d) Melanocytes

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10. Which of the following correctly describes the function of sebaceous (oil) glands?

- a) They cool the body by releasing sweat
- b) They protect the skin by producing an oily substance
- c) They stimulate hair growth by releasing keratin
- d) They produce melanin to prevent UV damage

11. Which part of the skin contains hair follicles?

- a) Epidermis
- b) Dermis
- c) Subcutaneous layer
- d) Connective tissue

12. What causes acne to form in the skin?

- a) Overproduction of melanin
- b) Blockage of sebaceous (oil) glands
- c) Rapid loss of epidermal cells
- d) Lack of oxygen supply to skin tissues

13. Why do nails and hair appear to grow after death?

- a) Keratin production continues after death
- b) The body releases stored melanin into the hair and nails
- c) The surrounding skin dehydrates and shrinks
- d) Dead cells continue dividing at the nail and hair base

14. What is the primary function of the subcutaneous layer?

- a) It serves as a protective waterproof barrier
- b) It stores fat and helps retain body heat
- c) It produces melanin for skin pigmentation
- d) It generates new skin cells to replace dead ones

Answer Key in Table Format

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
b	c	c	b	b	b	c	a	b
Q10	Q11	Q12	Q13	Q14				
b	b	b	c	b				

When are blackheads formed?

متى تتكون الرؤوس السوداء؟

- A) When grooves in the epidermis gather dirt
- B) When hair follicles grow inward rather than outward
- C) When there is an excess of keratin produced
- D) When sebaceous glands become clogged

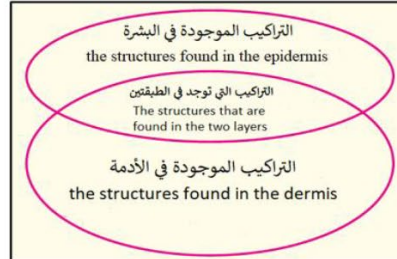
How does the skin regulate body temperature?

كيف يساعد الجلد على تنظيم درجة حرارة الجسم؟

- (a) By increasing sweat production
- (b) By retaining water
- (c) By producing vitamin D
- (d) By regulating fat content in the epidermis

The figure below shows a comparison of the structures found in the epidermis and in the dermis of human skin, study it and then answer the question: Which of the following is found in both the epidermis and dermis layers?

الشكل أدناه يقارن بين التراكيب الموجودة في البشرة والموجودة في الأدمة في جلد الإنسان، أدرسه ثم أجب السؤال: أي مما يلي يتواجد في كل من طبقتي البشرة والأدمة؟



Sweat gland, hair	الغدة العرقية ، الشعرة
Sebaceous gland, nerve tissue	الغدة الدهنية، النسيج العصبي
Epithelial cells, keratin	الخلايا الظلامية، الكيراتين
Connective tissue, hair follicles	النسيج الضام، بصيلات الشعر

Which is the first defense your body has against infectious disease?

أي مما يلي يعتبر خط الدفاع الأول لجسمك ضد الأمراض المعدية ؟

- A) The helper T cell
- B) An antibody
- C) The cytotoxic T cell
- D) Your skin

Functions of the Four Tissue Types in the Integumentary System

Tissue Type	Function in the Integumentary System
Epithelial Tissue	Forms the epidermis , providing protection against pathogens, UV radiation, and water loss
Connective Tissue	Found in the dermis , providing structural support, elasticity, and housing blood vessels and sensory receptors
Muscle Tissue	Includes arrector pili muscles , which contract to create "goosebumps" and help regulate temperature
Nervous Tissue	Contains sensory receptors that detect touch, temperature, pain, and pressure

Events That Occur During Skin Repair

When the skin is damaged, the body follows a **four-step** healing process:

1. **Inflammation** – Blood vessels dilate, white blood cells remove bacteria and debris, and clotting begins.
2. **Scab Formation** – A scab forms to protect the wound while epithelial cells begin regenerating.
3. **Tissue Regeneration** – Fibroblasts produce new connective tissue, and blood vessels grow to restore circulation.
4. **Remodeling** – The scab falls off, and the skin strengthens as collagen fibers reorganize.

This process ensures **wound healing** and **prevents infection**.

Name of Joint	Ball-and-Socket	Pivot	Hinge	Gliding	Sutures
Example					

The figure below shows some joints of the skeletal system.

Study it and answer the question:

Which letter of the following refers to the type of joint found in the hips and shoulders?

الشكل أدناه يظهر بعض مفاصل الجهاز الهيكلي.

تمعنه ثم أجب عن السؤال:

أي حرف مما يلي يشير إلى نوع المفصل الذي يتواجد في الفخذين والكتفين؟



The figure below shows some joints of the skeletal system.

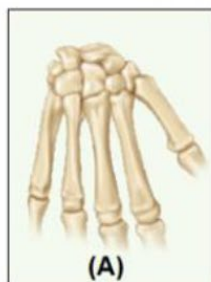
Study it and then answer the question:

Which letter of the following represent a gliding joint?

الشكل أدناه يظهر بعض مفاصل الجهاز الهيكلي.

تمعنه ثم أجب عن السؤال:

أي حرف مما يلي يشير إلى مفصل انزلاقي؟



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Which of the following pairs of terms is matched?

أي من أزواج المصطلحات التالية متوافق مع بعضه؟

- A) The skull, Gliding joint
- B) Wrist, pivot joint
- C) Shoulder, Sutures
- D) Knee, ball-and-socket joint

Which of the following pair of terms is mismatched?

أزواج المصطلحات التالية غير متوافق مع بعضه؟

A picture cc
Description

- A) The skull, sutures
- B) shoulder, ball-and-socket joint
- C) knee, hinge joint
- D) Ankles, pivot joint

1. Which type of joint provides the widest range of motion?

- a) Hinge joint
- b) Ball-and-socket joint
- c) Pivot joint
- d) Gliding joint

2. Which of the following is an example of a ball-and-socket joint?

- a) Elbow
- b) Knee
- c) Shoulder
- d) Wrist

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3. **What is the primary movement allowed by a pivot joint?**

- a) Side-to-side motion
- b) Back-and-forth motion
- c) Rotation
- d) No movement

4. **Which joint allows the twisting motion of the lower arm?**

- a) Ball-and-socket joint
- b) Pivot joint
- c) Hinge joint
- d) Gliding joint

5. **What type of joint is found in the knee?**

- a) Ball-and-socket joint
- b) Pivot joint
- c) Hinge joint
- d) Gliding joint

6. **Which type of joint allows movement similar to a door hinge?**

- a) Pivot joint
- b) Hinge joint
- c) Gliding joint
- d) Sutures

7. **Where are gliding joints commonly found in the body?**

- a) Skull
- b) Shoulder
- c) Wrist and ankles
- d) Elbows and knees

8. **What type of movement does a gliding joint allow?**

- a) Only rotational movement
- b) No movement
- c) Side-to-side and back-and-forth movement
- d) Hinge-like movement

9. Which type of joint is immovable?

- a) Pivot joint
- b) Ball-and-socket joint
- c) Gliding joint
- d) Sutures

10. How do sutures differ from other types of joints?

- a) They provide the greatest range of motion
- b) They allow back-and-forth movement
- c) They are immovable joints found in the skull
- d) They enable rotational movement of the arm

Answer Key in Table Format

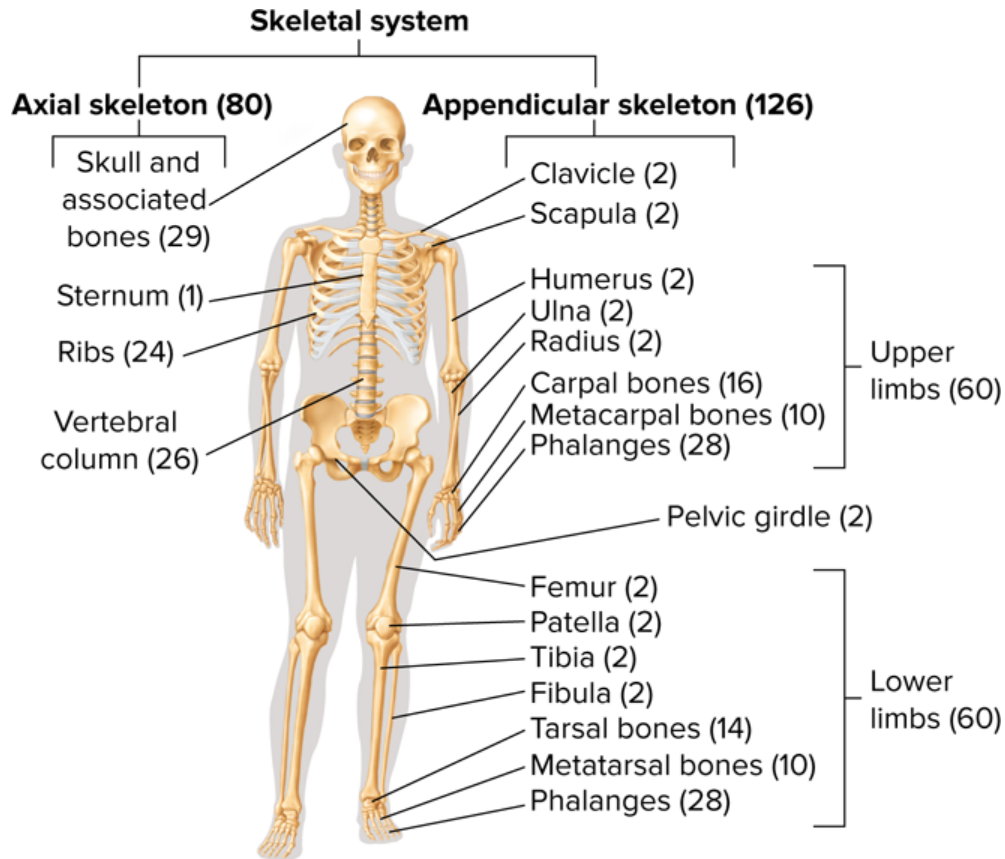
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
b	c	c	b	c	b	c	c	d	c

1. Which of the following statements is **TRUE** about joints in the human body?

- a) A hinge joint allows rotational movement like a pivot joint.
- b) Ball-and-socket joints provide the greatest range of motion in the body.
- c) Sutures in the skull allow slight movement to protect the brain.
- d) Gliding joints are only found in the fingers and toes.

2. Which of the following correctly matches the joint type with its function?

- a) Pivot joint – allows back-and-forth motion like a door hinge.
- b) Hinge joint – allows twisting motion in the lower arm.
- c) Ball-and-socket joint – enables movement in all directions.
- d) Sutures – allow rotational movement in the neck.



Which is **not** part of the axial skeleton?

أي مما يلي **ليس** جزءاً من الهيكل المحوري؟

- (a) Skull
- (b) Ribs
- (c) Vertebral column
- (d) Hip bone

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How many bones are in the adult human skeleton?

- A) 106
- B) 156
- C) 206
- D) 256

Which of the following is part of the axial skeleton?

- A) Humerus
- B) Femur
- C) Sternum
- D) Pelvis

The **appendicular skeleton includes which of the following?**

- A) Skull
- B) Ribs
- C) Vertebral column
- D) Legs

What is the function of red bone marrow?

- A) Stores calcium
- B) Produces blood cells
- C) Strengthens bones
- D) Stores fat

In which of the following bones can **red bone marrow be found?**

- A) Femur
- B) Sternum
- C) Pelvis
- D) All of the above

6. What does **yellow bone marrow primarily store?**

- A) Proteins
- B) Red blood cells
- C) Fat
- D) Calcium

7. Compared to adults, children's bones contain more:

- A) Yellow marrow
- B) Cartilage
- C) Red marrow
- D) Calcium

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Which of the following statements is **TRUE about bone marrow?**

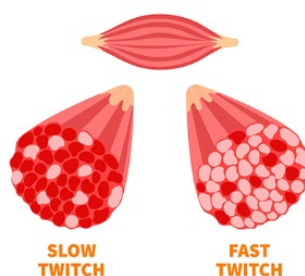
- a) Yellow bone marrow is responsible for producing red and white blood cells.
- b) Red bone marrow is primarily responsible for fat storage.
- c) Infants have more red bone marrow compared to adults.
- d) Bone marrow is only found in the skull and spine.

Which of the following correctly describes the difference between red and yellow bone marrow?

- a) Red bone marrow is found only in children, while yellow marrow is found only in adults.
- b) Red bone marrow produces blood cells, while yellow bone marrow stores fat.
- c) Yellow bone marrow is found in the ribs and vertebrae, while red marrow is found in the long bones of the arms and legs.
- d) Both types of marrow serve the same function in blood cell production.

Which of the following statements is **TRUE about the human skeleton?**

- a) The axial skeleton includes the bones of the shoulders, arms, and legs.
- b) The appendicular skeleton consists of the skull, vertebral column, and ribs.
- c) The axial skeleton provides support and protection for vital organs like the brain and heart.
- d) The appendicular skeleton is responsible for protecting internal organs like the lungs and brain.



Comparison Between Slow-Twitch and Fast-Twitch Muscles

	Slow-Twitch Muscles	Fast-Twitch Muscles
Contraction Speed	Slow	Fast
Endurance	High, resistant to fatigue for long periods	Low, fatigues quickly
Primary Energy Source	Aerobic respiration (uses oxygen)	Anaerobic respiration (does not use oxygen)
Mitochondria Quantity	High	Low
Myoglobin Content	High, giving it a darker color	Low, giving it a lighter color
Examples of Activities	Long-distance running, swimming	Weightlifting, jumping, sprinting
Muscle Fiber Size	Relatively small	Larger due to increased fiber count
Effect of Exercise	Increases mitochondria count with a slight increase in muscle size	Increases muscle fibers and significantly enlarges muscle size
Oxygen Dependence	Highly dependent on oxygen	Primarily relies on anaerobic respiration
Lactic Acid Buildup	Low, due to oxygen usage	High, leading to muscle fatigue
Examples of Athletes with Higher Proportion	Marathon runners, swimmers	Weightlifters, sprinters

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1. Which of the following statements is TRUE about slow-twitch muscle fibers?

- a) Slow-twitch fibers contract quickly and provide great strength for rapid movements.
- b) Slow-twitch fibers have many mitochondria and rely on aerobic respiration for endurance.
- c) Slow-twitch fibers contain little myoglobin and appear lighter in color.
- d) Slow-twitch fibers fatigue easily due to the buildup of lactic acid.

2. Which of the following correctly describes the difference between slow-twitch and fast-twitch muscle fibers?

- a) Fast-twitch fibers have more mitochondria and store oxygen, while slow-twitch fibers fatigue quickly.
- b) Slow-twitch fibers are darker in color due to high myoglobin content, while fast-twitch fibers are lighter.
- c) Slow-twitch fibers are used for short bursts of energy like sprinting, while fast-twitch fibers help with endurance.
- d) Fast-twitch fibers rely on aerobic metabolism, making them resistant to fatigue.

What is the primary factor that influences the differences in muscle performance between individuals?

- A) The total number of muscle fibers
- B) The ratio of slow-twitch to fast-twitch muscle fibers
- C) The size of muscle fibers
- D) The frequency of muscle contractions

Which of the following best describes slow-twitch muscle fibers?

- A) They fatigue quickly and are adapted for short bursts of energy
- B) They are lighter in color and rely on anaerobic metabolism
- C) They contract more slowly but have greater endurance
- D) They are adapted for rapid, explosive movements

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What is the function of myoglobin in slow-twitch muscle fibers?

- A) It stores oxygen and serves as an oxygen reserve
- B) It helps produce lactic acid for energy
- C) It provides energy through anaerobic metabolism
- D) It stores glycogen for energy production

Why do fast-twitch muscle fibers fatigue more easily than slow-twitch fibers?

- A) They rely on anaerobic metabolism, which causes a buildup of lactic acid
- B) They contain more mitochondria, which requires more energy
- C) They have more myoglobin, which reduces oxygen supply
- D) They contract slower, leading to greater energy consumption

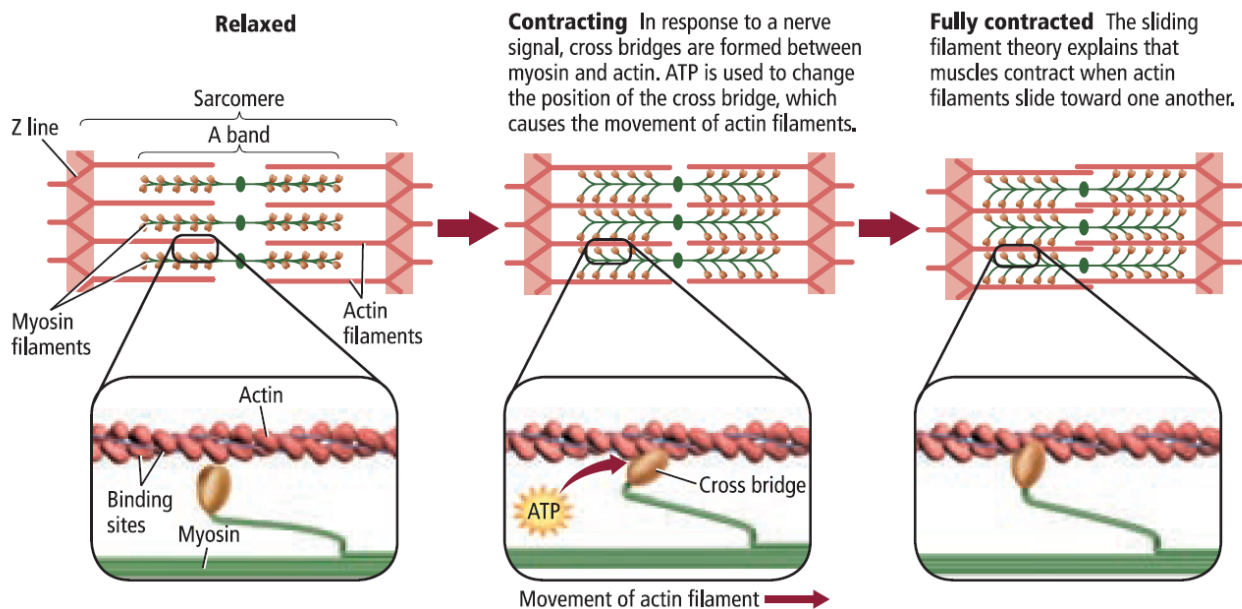
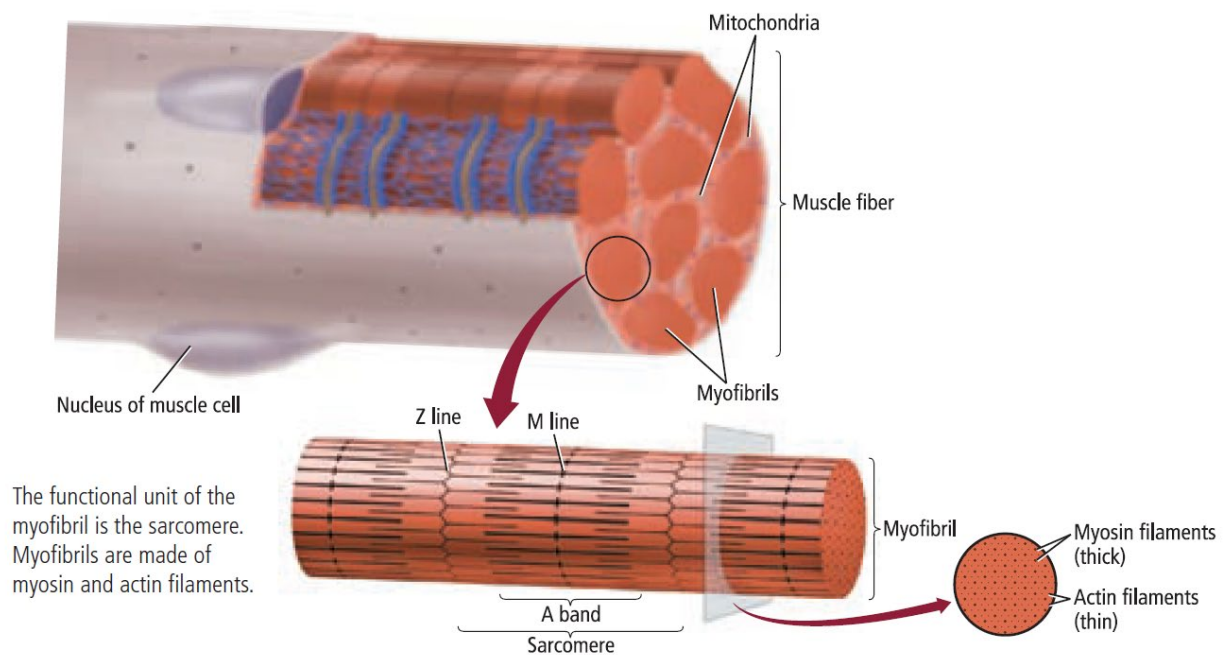
Which type of exercise is best suited for fast-twitch muscle fibers?

- A) Long-distance running
- B) Weightlifting or sprinting
- C) Swimming
- D) Yoga

Which requires (ATP)?

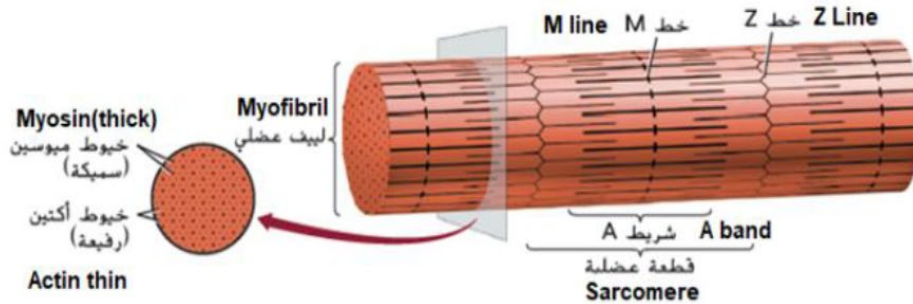
أي مما يلي يتطلب وجود أدينوسين ثلاثي الفوسفات (ATP) ؟

- A) Muscle contraction
- B) Muscle relaxation
- C) Neither muscle contraction nor relaxation
- D) Both muscle contraction and relaxation



The figure below shows the structure of a myofibril, study it and then answer the question: which of the following indicates where the **actin filaments** are attached within the myofibril?

الشكل أدناه يمثل تركيب ليف عضلي تمعنه جيداً ثم أجب عن السؤال: أي مما يلي يشير إلى المكان الذي ترتبط فيه **خيوط الأكتين** داخل الليف العضلي؟



1. A band

2. M line

3. Sarcomere

4. Z line

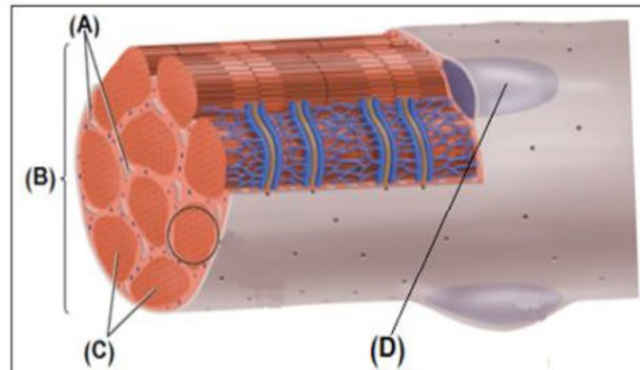
The figure below represents the structure of the muscle fiber.

Study it well and then answers the question:

Which letter of the following refers to the **mitochondria**?

الشكل أدناه يمثل تركيب الليف العضلي تمعنه جيداً ثم أجب عن السؤال:

أي حرف مما يلي يشير إلى **الميتوكوندريا**؟



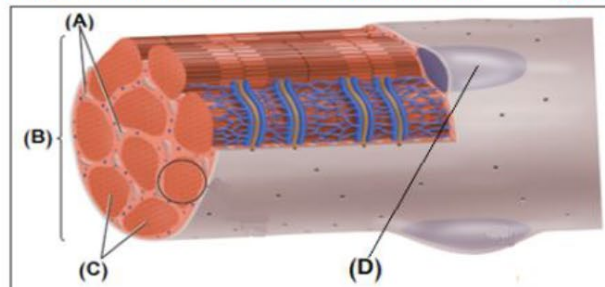
The figure below represents the structure of the muscle fiber.

Study it well and then answers the question:

Which letter of the following refers to the **Nucleus of muscle cell**?

الشكل أدناه يمثل تركيب الليف العضلي تمعنه جيداً ثم أجب عن السؤال:

أي حرف مما يلي يشير إلى **نواة الخلية العضلية**؟



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Which of the following is true about muscle metabolism?

- A) All muscle cells metabolize only aerobically.
- B) Muscles rely only on anaerobic respiration during exercise.
- C) Muscles can generate ATP through both aerobic and anaerobic respiration.
- D) Lactic acid fermentation produces more ATP than aerobic respiration.

How does the body recover from lactic acid buildup after exercise?

- A) Lactic acid is stored in muscle cells for later use.
- B) Rapid breathing restores oxygen, which helps break down lactic acid.
- C) Lactic acid is converted into glucose immediately.
- D) The liver removes all lactic acid from the bloodstream instantly.

What is the cause of rigor mortis after death?

- A) Depletion of ATP prevents muscles from relaxing.
- B) Excess lactic acid permanently stiffens muscles.
- C) Nerve signals continue stimulating muscle contraction.
- D) Muscle fibers expand due to oxygen loss.

When an animal dies, rigor mortis sets in.

Which of the following is an incorrect description of it?

عندما يموت حيوان ما، تبدأ حالة التيبس الرمي.

أي مما يلي وصفاً خاطئاً لذلك؟

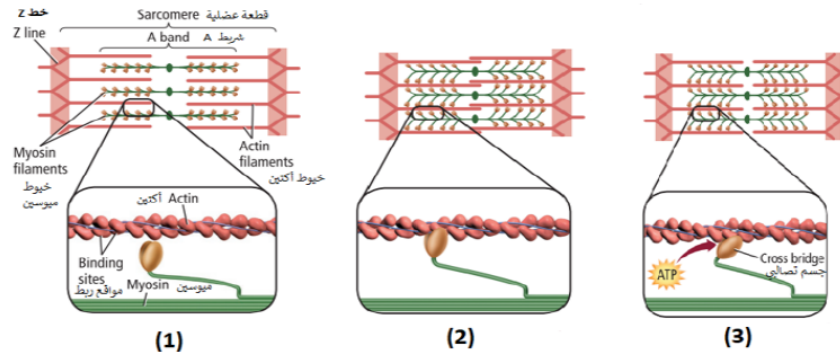
- A) Prolonged muscular contraction
- B) The calcium remains in the myofibrils
- C) It cannot produce (ATP)
- D) Pump the calcium back out of the myofibrils

What is the role of ATP in muscle relaxation?

- A) It breaks down actin filaments.
- B) It pumps calcium ions out of myofibrils, allowing relaxation.
- C) It increases the amount of lactic acid in muscles.
- D) It prevents mitochondria from functioning.

Which of the following number sets represents the correct illustration of muscle contraction in the figure below?

أي مما يلي يمثل الترتيب الصحيح لتصور انقباض العضلة في الشكل أدناه؟



A	2 ← 1 ← 3
B	2 ← 3 ← 1
C	1 ← 3 ← 2
D	1 ← 2 ← 3

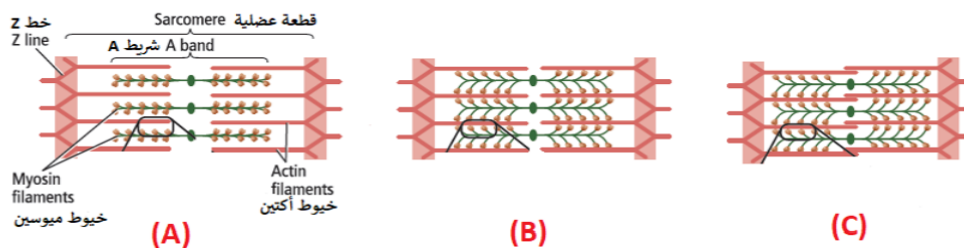
The figure below illustrates Muscle Contraction, study it and then answer the question:

الشكل أدناه يمثل تصور انقباض العضلة تمعنه جيداً ثم

أجب عن السؤال:

Which of the following does the letter (A) refer to?

أي مما يلي يشير إليه الحرف (A)؟



- A) Relaxed muscle
- B) Contracting muscle
- C) Fully contracted muscle
- D) Non-striated muscle

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Which of the following is true about skeletal muscles?

- A) Skeletal muscles are involuntary and control organ movement.
- B) Most skeletal muscles are arranged in antagonistic pairs.
- C) Skeletal muscles have a smooth, non-striated appearance.
- D) Skeletal muscle cells have only one nucleus.

What is the functional unit of a muscle that contracts?

- A) Myofibril
- B) Actin filament
- C) Sarcomere
- D) Z line

What is the main role of myosin filaments in muscle contraction?

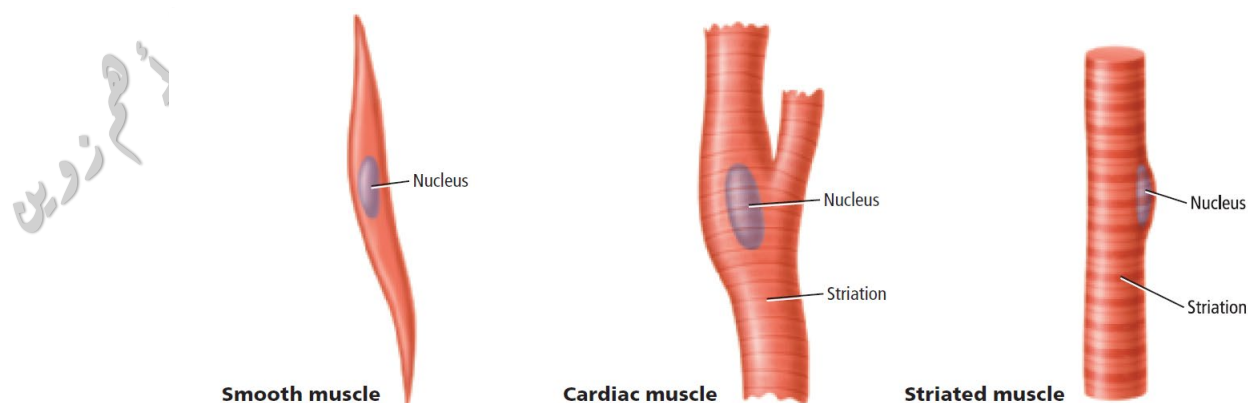
- A) They provide structural support to the muscle fiber.
- B) They interact with actin filaments to generate force for contraction.
- C) They store energy needed for muscle movement.
- D) They attach directly to the Z lines.

Why do skeletal muscles appear striated?

- A) Because of overlapping actin and myosin filaments
- B) Due to the presence of smooth muscle cells
- C) Because of mitochondria arrangement in muscle fibers
- D) Due to the fusion of multiple muscle fibers

What is the purpose of Z lines in muscle structure?

- A) They are the attachment points for actin filaments within a sarcomere.
- B) They connect muscle fibers to tendons.
- C) They act as storage sites for calcium ions.
- D) They prevent muscle fatigue.



Feature	Skeletal Muscle	Smooth Muscle	Cardiac Muscle
Location	Attached to bones	Walls of hollow organs (stomach, intestines, bladder, uterus)	Heart only
Control	Voluntary (conscious)	Involuntary (not consciously controlled)	Involuntary
Appearance	Striated (striped)	Non-striated (smooth)	Striated (striped)
Nuclei per Cell	Multinucleated	Single nucleus	Usually single, but may have more
Function	Movement, posture, heat production	Moves food, controls blood pressure, regulates organ function	Pumps blood through the heart
Cell Structure	Long, cylindrical fibers	Spindle-shaped cells	Branched fibers, interwoven network
Special Features	Rapid contraction, fatigues easily	Slow, sustained contraction, resistant to fatigue	Rhythmic, continuous contraction, resistant to fatigue

Which of the following muscles shown below are classified as **voluntary muscles**?

أي من العضلات المبينة أدناه تُصنف من العضلات الإرادية؟



(A)



(B)



(C)

B

C

B&C

A

Which of the muscles shown below are classified as **involuntary muscles**?

أي من العضلات المبينة أدناه تُصنف من العضلات اللاإرادية؟



(A)



(B)



(C)

B

C

B&C

A

Which of the following is **true** about muscle structure?

- A) A muscle consists of a single fiber.
- B) A muscle consists of groups of fibers or muscle cells bound together.
- C) Muscles are made up only of skeletal muscle cells.
- D) Muscles do not have any cellular structure.

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Which type of muscle is found lining hollow internal organs like the stomach and intestines?

- A) Skeletal muscle
- B) Smooth muscle
- C) Cardiac muscle
- D) Striated muscle

What is a key characteristic of smooth muscle under a microscope?

- A) It appears striated with multiple nuclei per cell.
- B) It has a web-like arrangement for rhythmic contraction.
- C) It lacks striations and has a single nucleus per cell.
- D) It can be controlled voluntarily.

Which muscle type is exclusively found in the heart?

- A) Skeletal muscle
- B) Smooth muscle
- C) Cardiac muscle
- D) Voluntary muscle

What is the function of gap junctions in cardiac muscle cells?

- A) To allow food to move through the digestive tract.
- B) To make the heart muscle contract efficiently and rhythmically.
- C) To provide voluntary control of muscle movements.
- D) To prevent the heart from contracting.

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What do all infectious diseases have **in common**?

- A) They are caused by pathogens and disrupt homeostasis.
- B) They are only caused by viruses.
- C) They can only be spread through direct contact.
- D) They only affect humans.

Which of the following is **not** considered a pathogen?

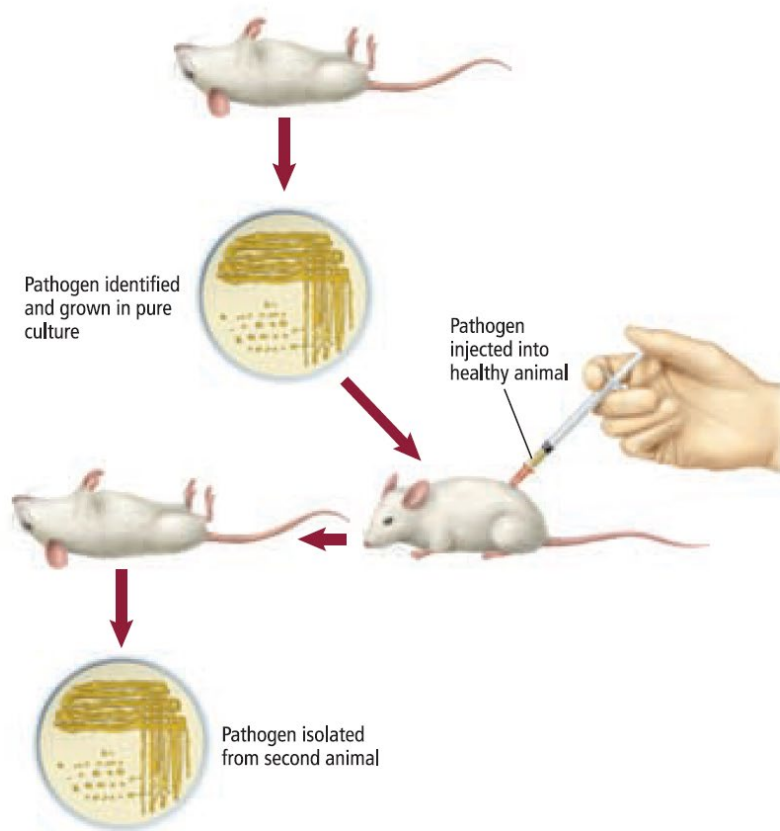
- A) Bacteria
- B) Viruses
- C) White blood cells
- D) Fungi

How do **beneficial bacteria** help protect the body from infection?

- A) They produce harmful chemicals that destroy the body's cells.
- B) They compete with pathogens, preventing them from thriving and multiplying.
- C) They cause mild infections to build immunity.
- D) They absorb pathogens and store them in the bloodstream.

Here is a table summarizing **Koch's Postulates**:

Postulate	Description
Postulate 1	The suspected pathogen must be isolated from the diseased host in every case of the disease.
Postulate 2	The suspected pathogen must be grown in pure culture on artificial media in the laboratory, without contamination from other microorganisms.
Postulate 3	The suspected pathogen from the pure culture must cause the same disease when introduced into a healthy host .
Postulate 4	The suspected pathogen must be re-isolated from the new host , grown again in pure culture, and shown to be identical to the original pathogen .
Exceptions	Some pathogens, like the one causing syphilis , cannot be grown in pure culture. Viruses require cultured cells instead of artificial media.

**Postulate 1**

The suspected pathogen must be isolated from the diseased host in every case of the disease.

Postulate 2

The suspected pathogen must be grown in pure culture on artificial media in the laboratory.

Postulate 3

The suspected pathogen from the pure culture must cause the same disease when placed in a healthy new host.

Postulate 4

The suspected pathogen must be isolated from the new host, grown again in pure culture, and shown to have the same characteristics as the original pathogen.

Chemical barriers Saliva, tears, and nasal secretions contain the enzyme lysozyme. Lysozyme breaks down bacterial cell walls, which kills pathogens

Which of the following is **not** considered as a chemical barrier?

أي مما يلي **ليس** من الحواجز الكيميائية؟

- A) Tears
- B) Saliva
- C) Mucus
- D) Skin cells

Type of Disease	Definition	Example
Endemic	A disease that is continually present in a population but at low levels.	Common cold in many regions, malaria in certain tropical areas.
Epidemic	A disease that causes a sudden outbreak affecting many people in a specific region or community .	Influenza outbreak in a city, measles outbreak in a school.
Pandemic	A disease that spreads over multiple countries or continents , affecting a large global population .	COVID-19, 1918 Spanish flu .

Which of the following best describes Corona disease?

أي مما يلي يصف مرض كورونا؟

- A) Endemic disease
- B) Epidemic disease
- C) It is transmitted by arthropods
- D) Pandemic disease

Which of the following best describes an **endemic** disease?

- A) A disease that suddenly affects a large number of people in a city.
- B) A disease that is continually present in a population but at low levels.
- C) A disease that spreads across multiple continents.
- D) A disease that disappears after a short period.

What is the main difference between an epidemic and a pandemic?

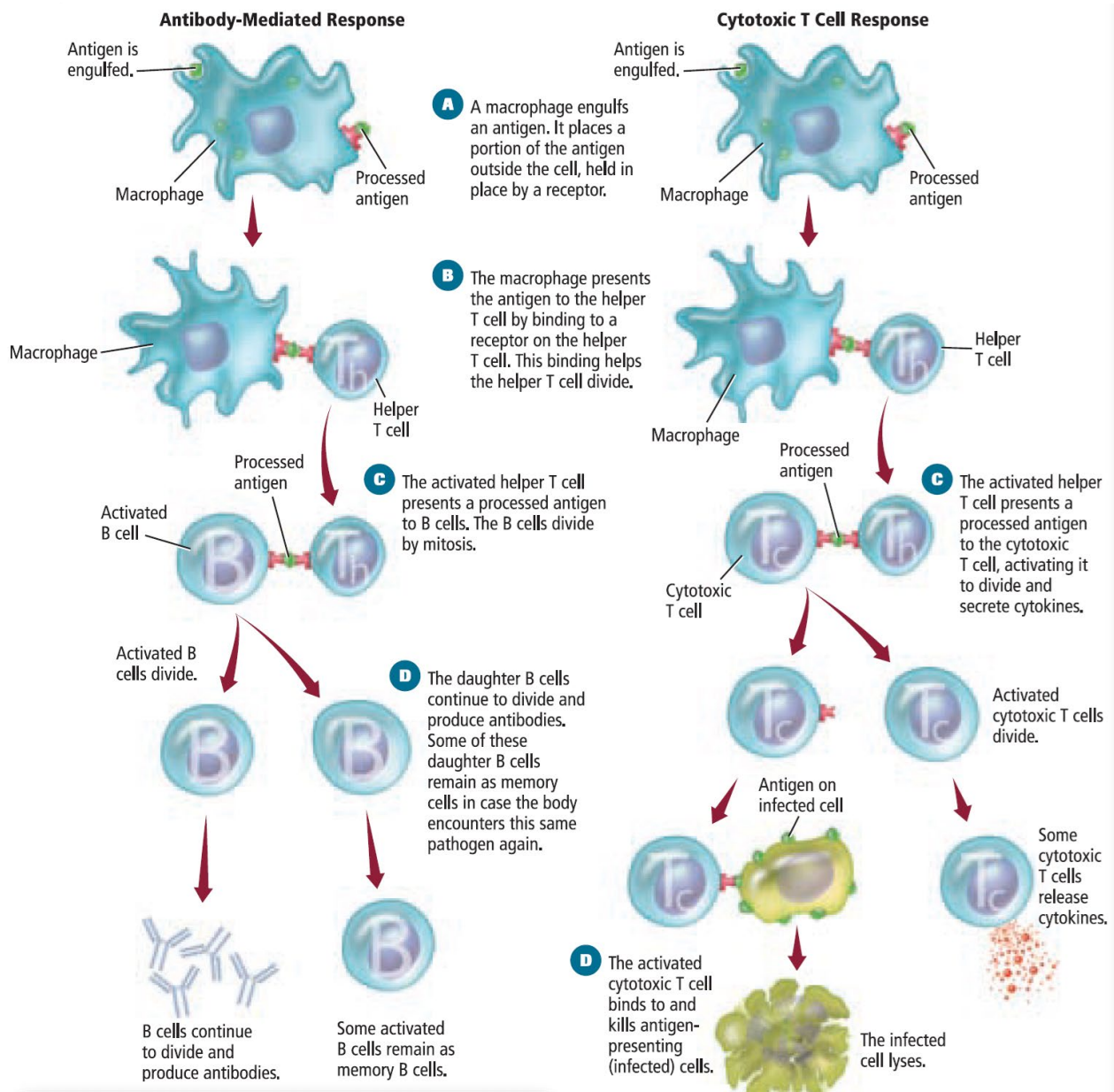
- A) An epidemic affects a specific region, while a pandemic spreads globally.
- B) Epidemics are caused by bacteria, while pandemics are caused by viruses.
- C) Pandemics only occur once every 100 years, while epidemics happen frequently.
- D) An epidemic is deadlier than a pandemic.

Step	Antibody-Mediated Response	Cytotoxic T Cell Response	Notes
A	A macrophage engulfs an antigen and presents a portion of it on its surface.	processes it.	Macrophages act as antigen-presenting cells (APCs) to initiate the immune response.
B	The macrophage presents the antigen to a helper T cell , activating it.	binds and becomes activated.	Helper T cells recognize the antigen using their T-cell receptors (TCRs) .
C	The activated helper T cell presents the antigen to B cells , causing them to divide and multiply.	The activated helper T cell presents the antigen to cytotoxic T cells , which begin to divide and release cytokines.	Helper T cells stimulate both B cells (antibody production) and cytotoxic T cells (direct attack on infected cells) .
D	Daughter B cells differentiate into plasma cells (produce antibodies) and memory B cells (provide immunity).	Cytotoxic T cells bind to infected cells and destroy them by releasing cytotoxins.	- Plasma cells make antibodies to fight the infection. - Memory B cells ensure a faster response if reinfected. - Cytotoxic T cells kill infected cells by inducing cell lysis .

Key Notes:

- **Antibody-Mediated Response** (Humoral Immunity) → Targets pathogens in body fluids using **B cells and antibodies**.
- **Cytotoxic T Cell Response** (Cell-Mediated Immunity) → Targets infected cells directly using **cytotoxic T cells**.
- Both responses rely on **antigen presentation** and **helper T cell activation**.

Would you like any modifications or more details? 😊



In the figure below, the activated helper

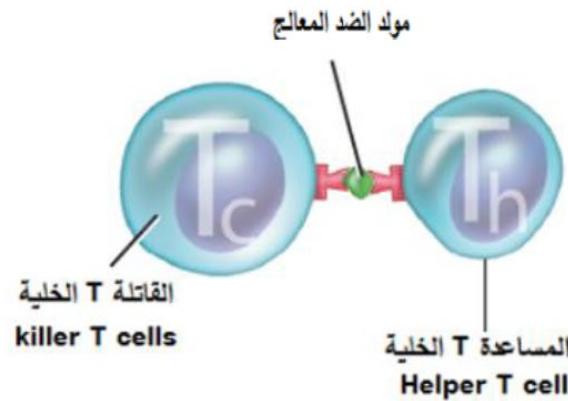
T cell presents a processed antigen

to the Cytotoxic T cell activating it to divide and secrete.....

في الشكل أدناه، تقدّم الخلايا T المساعدة المنشّطة

مولد ضدّ معالج إلى الخلايا T القاتلة، منشّطة إياها

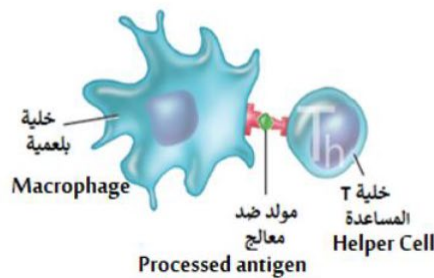
لتنقسم وتفرز.....



- A) Histamine
- B) Interferon
- C) Acetylcholine
- D) Cytokines

In the figure below, the macrophage presents the antigen to the helper T cell by binding to a receptor on the helper T cell. What is the importance of this binding?

في الرسم أدناه، تقدم خلية البلعمة مولد ضدّ إلى الخلية T المساعدة، عن طريق ربطه بمستقبل على الخلية T المساعدة. فما أهمية هذا الارتباط؟



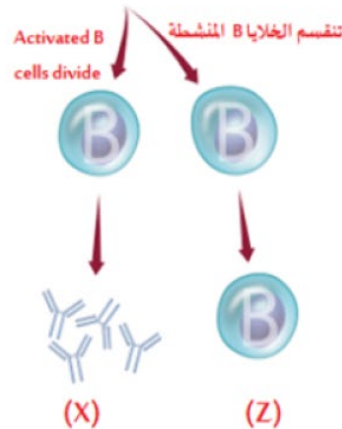
- A) Helps the helper T cell to divide
- B) Helps the macrophage cell to divide
- C) Converts antigen into processed antigen
- D) Produces direct antibodies

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أدھم زوين

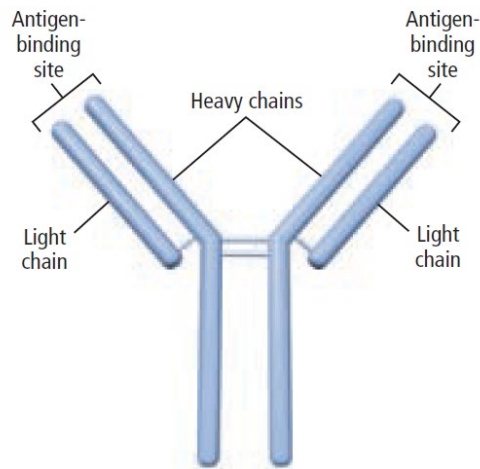
The figure below is illustration of Specific Immune Responses, study it and then answer the question: what do the letters (x) and (z) represent?

الشكل ادناه يمثل رسم توضيحي لتصور الاستجابة المناعية المتخصصة، أدرسه ثم أجب عن السؤال: ماذا يعني الحرفان (x) و (z)؟



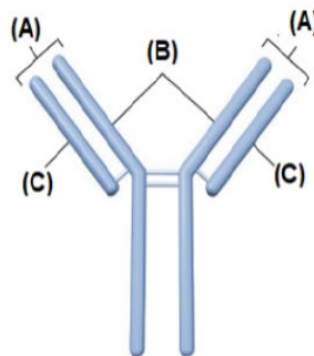
- ☐ (X): Antigens and (Z): Memory cells
- ☐ (X): Processed antigen and (Z): Cytotoxic B cell
- ☐ (X): Antibodies and (Z): Helper B cell
- ☐ (X): Antibodies and (Z): Memory cells

أدھم زوين



The figure below is an illustration of an antibody, study it and answer the question:

What do the letters (A) and (B) represent?

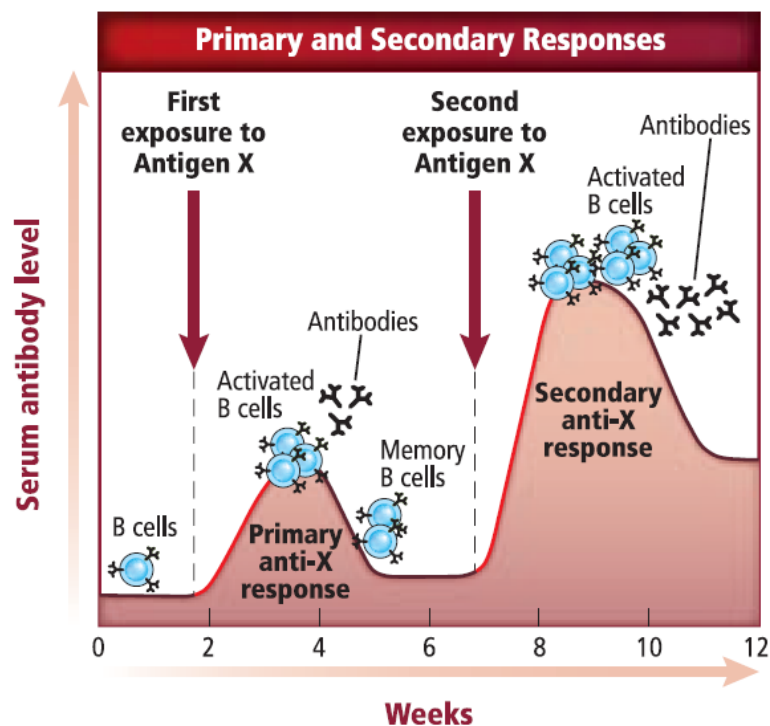


الشكل أدناه يمثل رسم توضيحي لجسم مضاد، أدرسه ثم أجب عن السؤال:

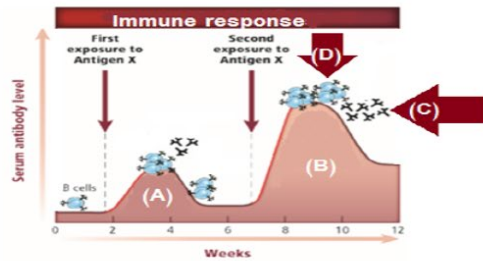
ماذا يعني الحرفان (A) و(B)؟

- ☐ (A): Antigen binding site and (B): Light chain
- ☐ (A): Heavy chain and (B): Antigen binding site
- ☐ (A): Light chain and (B): Antigen binding site
- ☐ (A): Antigen binding site and (B): Heavy chain

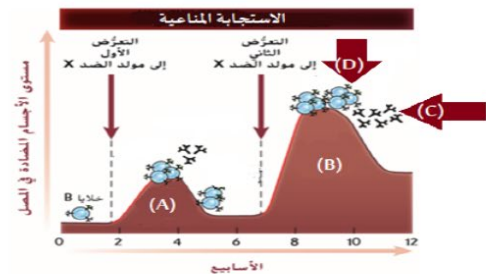
Characteristic	Primary Immune Response	Secondary Immune Response
Speed of Response	Slower; takes days to weeks to develop	Faster; occurs within hours to a few days
Antibody Production	Produces fewer antibodies	Produces a higher quantity of antibodies
Peak Response	Lower peak antibody concentration	Higher peak antibody concentration
Memory Cells	Few memory B and T cells are formed	Many memory B and T cells are activated
Duration of Immunity	Shorter-lasting immune response	Longer-lasting immune response
Effectiveness	Weaker, may not prevent illness	Stronger, often prevents illness
Reason for Occurrence	First exposure to an antigen	Subsequent exposure to the same antigen



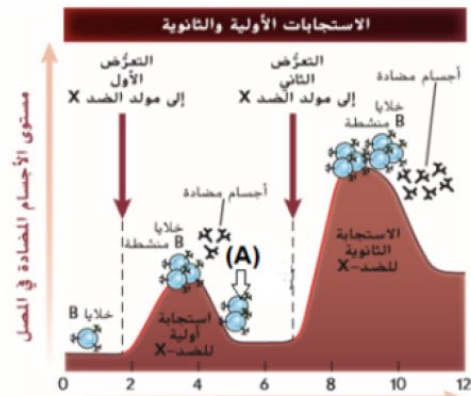
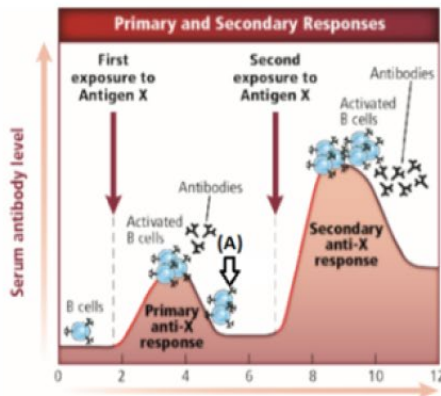
The below graph shows the immune responses to antigens exposure. Which letter of the following indicates a primary immune response?



يُظهر هذا الرسم البياني الاستجابة المناعية عند التعرض لموِّد الضد. أي حرف مما يلي يشير إلى استجابة مناعية أولية؟



What does the letter(A) refer to in the figure below?



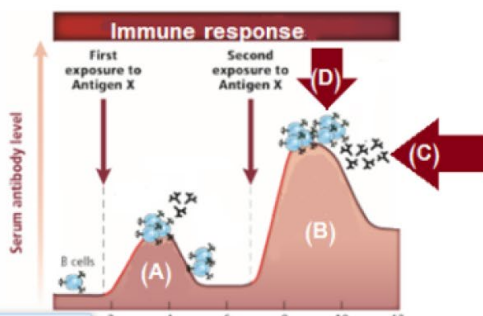
A) Helper T cell

B) Cytotoxic T cell

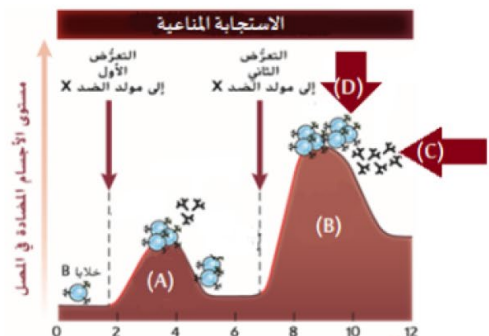
C) Macrophage cell

D) Memory B cell

The below graph shows the immune responses to exposure to an antigen. which letter of the following indicates a secondary immune response?



يُظهر هذا الرسم البياني الاستجابة المناعية عند التعرض لموِّد الضد. أي حرف مما يلي يشير إلى استجابة مناعية ثانوية؟



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a table differentiating the five categories of non-infectious diseases based on their **cause** and **examples**:

Category	Cause	Examples
Genetic Disease	Caused by inherited faulty genes or chromosomal abnormalities	Sickle cell anemia, Down syndrome, Huntington's disease, hemophilia
Degenerative Disease	Caused by the natural aging process or premature breakdown of body tissues	Osteoarthritis, arteriosclerosis, Alzheimer's disease
Metabolic Disease	Caused by errors in biochemical pathways , often affecting digestion or metabolism	Type 1 diabetes, phenylketonuria (PKU), Tay-Sachs disease
Inflammatory Disease	Caused by an overactive immune response or chronic inflammation	Asthma, rheumatoid arthritis, Crohn's disease
Cancer	Caused by uncontrolled cell growth due to genetic mutations and environmental factors	Leukemia, lung cancer, breast cancer

Which type of non-infectious disease is defined as a problem in a biochemical pathway in the body?

- A. inflammatory disease
- B. metabolic disease
- C. degenerative disease
- D. cancer

Which of the following is an example of a genetic disease?

- A) Type 1 diabetes
- B) Down syndrome
- C) Asthma
- D) Osteoarthritis

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What is the primary cause of degenerative diseases?

- A) Viral infections
- B) Inherited genetic mutations only
- C) Aging and tissue breakdown
- D) Autoimmune reactions

Which disease results from an error in a biochemical pathway?

- A) Rheumatoid arthritis
- B) Type 1 diabetes
- C) Leukemia
- D) Arteriosclerosis

What is the main characteristic of cancer?

- A) It is always inherited
- B) It is caused by an overactive immune system
- C) It results from uncontrolled cell growth
- D) It only affects the elderly

Which category of non-infectious disease is primarily caused by an overactive immune response?

- A) Metabolic diseases
- B) Inflammatory diseases
- C) Degenerative diseases
- D) Genetic diseases

Disease	Maximum Number of Cases in a Year	Number of Cases in 1999 in U.S.	Percent Change
Measles	894,134	60	–99.99
Mumps	152,209	352	–99.77
Polio (paralytic)	21,269	0	–100.0
Tetanus	1560	33	–97.88
Hepatitis B	26,611	6495	–75.59

Which disease experienced the **greatest percent decrease** in cases since its maximum recorded year?

- A) Measles
- B) Polio (paralytic)
- C) Hepatitis B
- D) Tetanus

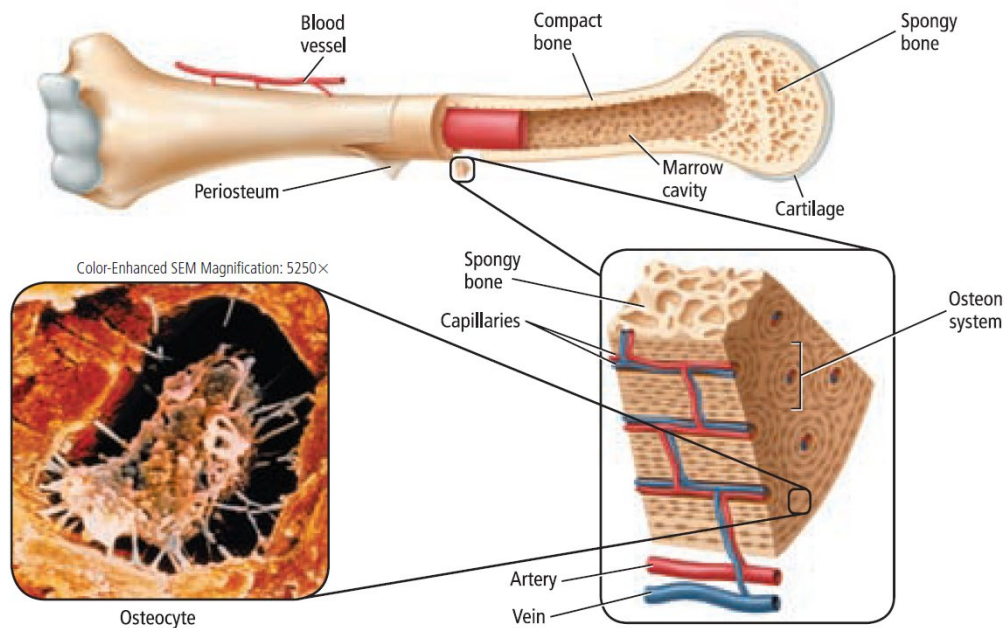
Which disease had the highest number of recorded cases in a single year before vaccinations were introduced?

- A) Mumps
- B) Measles
- C) Hepatitis B
- D) Tetanus

How much has Hepatitis B decreased in the U.S. from its maximum recorded cases?

- A) 99.99%
- B) 97.88%
- C) 75.59%
- D) 100%

الزوين



Feature	Compact Bone	Spongy Bone
Structure	Dense and strong	Porous with many cavities
Location	Outer layer of all bones	Inside short, flat, and irregular bones; at the ends of long bones
Function	Provides strength and protection	Reduces weight of the bone and supports bone marrow
Haversian Systems	Present; contains blood vessels and nerves	Absent; relies on surrounding compact bone for nutrients
Bone Marrow	Typically does not contain marrow	Contains red bone marrow , which produces blood cells
osteon systems	yes	No

Compact bone gives **strength**, while spongy bone provides **lightness and flexibility**.

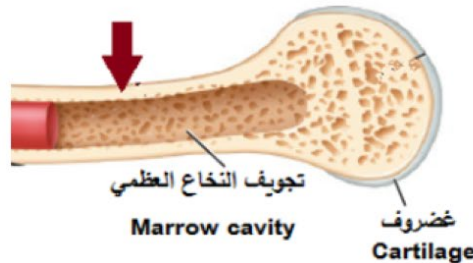
الزوين

Use the diagram below to answer the question:

Which of the following is a characteristic of the portion of the bone indicated by the arrow?

استخدم الرسم التالي للإجابة عن السؤال:

أي مما يلي هو سمة جزء العظمة الذي يشير إليه السهم؟



- A. It contains no living cells.
- B. It contains bone marrow.
- C. It is the only type of bone tissue in long bones.
- D. It is made of overlapping osteon systems.

What is the primary function of spongy bone?

- A) To provide strength and protection
- B) To support bone marrow and reduce bone weight
- C) To store calcium and phosphate
- D) To form the outermost layer of all bones

Where is spongy bone typically found?

- A) In the outer layer of long bones
- B) In the center of short and flat bones and at the ends of long bones
- C) Only in the skull
- D) Surrounding the Haversian canals

4. Which structural feature is unique to compact bone?

- A) Trabeculae
- B) Osteon systems (Haversian systems)
- C) Bone marrow cavities
- D) Spongy texture