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ENGLISH FOR MEDICINE

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ANATOMY

1. CELLS AND TISSUES

Cells are the basic building structures of all living things. Read the text below and try to understand the meaning of the unknown words or phrases:

The cell is often considered the smallest unit of a living organism, and it consists of several different components, each carrying out basic specialised functions. The human body is made up of trillions of cells working together to ensure the survival of the individual.

Cells are constantly performing thousands of (bio-)chemical (metabolic) reactions which allow homeostasis, growth, and, with some exceptions, reproduction. Individual cell lifespan and cell replicative capacity vary according to three core factors controlling the metabolic rate: cell size, organism size, and organism temperature. There are around 200 different types of human cells performing different functions, such as white blood cells (leukocytes), myocytes, fat cells, etc. Cells which share a common embryonic origin form tissues such as the lining of the intestine or the surface of the skin. Cells in a tissue have similar morphological features and work together as a unit, as they are arranged in an orderly fashion to achieve the tissue's functions. And despite their variety, cells are specialised to carry out four basic functions. Based on these functions cells (including their extracellular materials) can be grouped into four classes forming the fundamental tissues of the human body:

1. Epithelial tissue, also referred to as epithelium, covers the outer surfaces of the body, lines internal organs, cavities, and passageways;
2. Connective tissue binds cells and organs of the body together to ensure protection, support, and integration of all body parts. It is composed of widely spread cells and intercellular matrix, such as bone and blood – specialised connective tissues, in which the intercellular matrix is, respectively, hard and liquid.
3. Muscle tissue is excitable, responsive to stimuli and capable of contraction in order to provide movement;
4. Nervous tissue is also excitable, conducts electrical impulses, and forms the nervous system.

1.1. Read the text above and establish whether the following statements are true (T) or false (F):

1. All humans are made up of trillions of types of cells. T / F
2. Not all human cells are actively dividing cells. T / F
3. All the cells in our bodies are renewed after seven years. T / F
4. Human cells are organised into four broad categories of tissues. T / F
5. Blood is considered a connective tissue because it has a matrix. T / F

1.2. Put the following words in the corresponding column, according to their meaning:

able to, achieve, acknowledge, adequate, against, although, amount to, competent, answer, contain, be composed of, complete, comprise, conduct, in the face of, despite, embody, even though, execute, include, in contempt of, incorporate, fitted, feel for, fulfil, be made (up) of, go about, return, notwithstanding, qualified, reply, proficient, perform, relate to, pursue, react, regardless of, retort, skilled, up to.

Consist of	Carry out	Capable of	Respond to	In spite of
1.	1.	1.	1.	1.
2.	2.	2.	2.	2.
3.	3.	3.	3.	3.
4.	4.	4.	4.	4.
5.	5.	5.	5.	5.
6.	6.	6.	6.	6.
7.	7.	7.	7.	7.
8.	8.	8.	8.	8.

1.3. Fill in the sentences with the missing word (choose among is/are, much/many, little/few). Consider the distinction between countable and uncountable nouns:

1. Sometimes news _____ bad for your health, leading to anxiety and aggression.
2. How _____ information do you need to write the report?
3. The bandage scissors _____ not on my tray and I need to cut the gauze.
4. In biology, offspring _____ the progeny of living organisms.
5. I don't need _____ advice, I can make mistakes on my own.
6. I have _____ money, I cannot afford to buy it.

7. For such a short period of time we won't need _____ luggage, we'll only take two suitcases with us.
8. She has very _____ pyjamas as she usually wears a plain t-shirt and undies at night.
9. The institution has made _____ progress to put in place measures to prevent corruption, so it was sanctioned.
10. It is important to ensure that the minimum wages _____ adapted to the national economic context.
11. Politics _____ said to be the art of the impossible. His politics _____ rather liberal.
12. The staff _____ being evacuated from the building.

1.4. Fill in the table by providing the missing words in plural or singular form:

Singular	Plural
	brethren
	stimuli
gas	
passer-by	
grown-up	
	lice
nucleus	
	mitochondria
woman	
newborn	
	axes
commando	
	means
	statistics
Portuguese	

1.5. The nouns below have different meanings in singular and in plural. Write sentences of your own using these words, both in singular and in plural, paying attention to the change in meaning:

Spectacle: _____

Spectacles: _____

Cloth:

Clothes:

Manner:

Manners:

Custom:

Customs:

Premise:

Premises:

Ground:

Grounds:

Damage:

Damages:

Pain:

Pains:

Good:

Goods:

Blind:

Blinds:

1.6. Multi-meaning words: the terms ‘class’ and ‘material’ can have different meanings, depending on the context.

Class: Match the situations described in column A with the suitable definition of ‘class’ in column B, according to the meaning:

A	B
1. Helen bought a business class ticket from the same airline, which was surprisingly cheap.	a. a group of students who are taught together at school, college, or university
2. I would class her behaviour as non-compliant with the company’s policy.	b. the period during which a group of students meets for instruction
3. Mammals are vertebrate animals (referred to as class Mammalia), and are grouped into Monotremes, Marsupials, and Eutheria.	c. a group of people who have the same economic and social position
4. Not only is he a class tennis player, but he is also a very well-educated man.	d. a group into which goods, services, or people are put according to their standard

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5. My last class finishes at 7, so we can meet at 7.30 at the train station.

e. the quality of being stylish or fashionable

6. She lives in an upper class neighbourhood of Barcelona.

f. a group of related plants or animals, in the general classification of plants and animals

7. The whole class had to take a test in biochemistry because of John's rude behaviour.

g. of high quality, integrity, status, or style

8. She is rich and beautiful, but she's got no class whatsoever.

h. to rank or classify

Key: 1. __, 2. __, 3. __, 4. __, 5. __, 6. __, 7. __, 8. __

Material: Now do the same as above for the word 'material':

A	B
1. How much material should I buy for a long dress?	a. a physical substance of which things are made; component or constituent.
2. We need diverse teaching materials which should also be made available to students.	b. facts, notes, etc, that a finished work may be based on or derived from
3. In contrast to physical forces, material forces act on the material manifold.	c. cloth or fabric
4. If you have any piece of information that is material to the investigation, please let us know.	d. a person who has qualities suitable for a given occupation, training, etc.
5. Our society is more interested in the material well-being and satisfying the immediate needs.	e. equipment that you need for a particular activity
6. The company supplies a variety of products used as raw materials in the manufacture of concrete mixtures and asphalt.	f. relating to physical objects or money rather than emotions or the spiritual world
7. Mr. Stevens is very bright, but he is not teacher material.	g. important or having an important effect
8. I have collected enough material for writing the literature review section of my article.	h. relating to, concerned with, or involving matter

Key: 1. __, 2. __, 3. __, 4. __, 5. __, 6. __, 7. __, 8. __

1.7. Find two more synonyms for the words below:

(to) ensure	guarantee
lifespan	life expectancy
renewal	rebirth
(to) replicate	copy
(to) line	pad
passageway	passage
(to) bind	attach
structure	constitution

1.8. The fragment below contains 10 mistakes. Read the text carefully and identify them:

There are four types of tissues: epithelial, connective, mussel, and nervous. All sells and tissues in the body derive from three germ layers in the embryo: the ectoderm, mesoderm, and endoderm. Different types of tissues form membranes that inclose organs, provide a friction-free interaction between organs, and keep organs together.

There are two basic types of tissue membranes: connective tissue and epithelial membranes. Mucous membranes line the digestive, respiratory, or urinary systems, as well as the reproductive tracked. They are coated with the secretions of mucus glands. Serious membranes line body cavities close to the exterior of the body: the peritoneal, plural, and pericardial cavities. The cutaneous membrane, or the skin, covers the body surface.

The connective tissue membrane is formed solely from connective tissue. These membranes encapsulate organs, such as the livor, and line our movable joint. Sinovyal membranes line joint cavities and produce the fluid within the joint.¹

1.9. You see four words in each line. One word doesn't fit with the others for some reasons. You have to spot the odd one and circle it:

1. lysosome	peroxisome	centrosome	rhizome
2. red blood cell	white blood cell	haematocyte	platelet
3. phospholipids	bilayers	cholesterols	glycoproteins
4. dendrite	soma	node of Ranvier	basket cell
5. osteocyte	chondrocyte	osteoblast	osteoclast
6. enucleate	binucleate	polynucleate	anucleate
7. muscle tissue	connective tissue	epithelial tissue	soft tissue
8. meninges	epithelial membrane	synovial membrane	diaphragm
9. neutrophils	basophils	mast cells	T cells
10. reticulocyte	red blood cell	red blood corpuscle	erythrocyte

¹ Adapted from: J. G. Betts, K. A. Young, J. A. Wise; E. Johnson, B. Poe, D. H. Kruse, O. Korol, J. E. Johnson; M. Womble, and P. DeSaix, *Anatomy and Physiology*, published by OSCRiceUniversity and licensed under Creative Commons Attribution 4.0 International License, Invalid Date, <https://opentextbc.ca/anatomyandphysiologyopenstax/chapter/types-of-tissues>. Accessed 28 November 2021

1.10. The cell consists of several parts. Some of these structures, called organelles, are specialised in performing certain tasks within the cell. Match each description below with one of the major parts contained by the human cells and write the corresponding letter in the key below the table:

Parts	Functions
Cytoplasm	a. A membrane-bound organelle that packages, modifies and transports molecules to the targeted destinations.
Cytoskeleton	b. Complex organelles, with their own genetic material, that produce most of the chemical energy necessary for the cell's biochemical reactions.
Endoplasmic reticulum (ER)	c. The outer lining of the cell. It separates the cell from its environment; it is semi-permeable and allows materials to enter and exit the cell.
Golgi apparatus	d. The cell's command centre, that controls the growth and reproduction of the cell. It also houses DNA. It is surrounded by a double membrane which protects the genetic material.
Lysosomes and peroxisomes	e. A network of filamentous proteins. It determines cell shape, participates in cell division, and allows cells to move. It is also involved in cell motility, movement of organelles and vesicles through the cytoplasm, and other functions essential for cellular homeostasis and survival.
Mitochondria	f. Organelles consisting of RNA and associated proteins that perform biological protein synthesis.
Nucleus	g. The viscous substance (called the cytosol), external to the nuclear membrane and internal to the cellular membrane, where most metabolic activities take place. It is made up of water, proteins, lipids, nucleic acids, inorganic salts, etc.
Plasma membrane	h. The recycling centre of the cell. They break down toxic materials and foreign bacteria in the cell and recycle worn-out cell components.
Ribosomes	i. A network of membranes connected to the nucleus that helps in the synthesis, folding, modification, and transport of proteins.

Key:

Cytoplasm: ____; Cytoskeleton: ____; ER: ____; Golgi apparatus: ____; Lysosomes and peroxisomes: ____; Mitochondria: ____; Nucleus: ____; Plasma membrane: ____; Ribosomes: ____.

1.11. Match the prefixes and suffixes below with their meanings in the second column and find the corresponding example in the third column. Explain the terms in the third column and try to find another example. The first one is already solved as an example:

cata-	down, against, reverse	catabolism (molecule breakdown) Another example: <i>catabiosis</i> (degradation of cells)
-cyte	around	<i>periatrial</i>
e-, ex-	cell	<i>mesoderm</i>
ecto-	dissolution, breakdown	<i>totipotent</i>
endo-	all	<i>enucleate</i>
- lysis	inner, inside	<i>hepatocyte</i>
meso-	outer, outside	<i>synapsis</i>
per-	out of, away from	<i>ectoderm</i>
peri-	medium, middle	<i>endoderm</i>
sym-, syn-	through	<i>haemolysis</i>
totus-	together, with	<i>permeate</i>

1.12. Read the text below and choose the correct options in the given context:

Connective tissue is one of the four **main/mane/mean** classes of tissues. Connective tissue has three **chore/core/cure** components: ground substance, fibres, and cells. Ground substance is a clear, colourless, **viscous/viscose/viscus** fluid, composed of proteoglycans and cell adhesion proteins. Connective tissue fibres provide support; the three types of fibres **found/founded/finded** in connective tissue are: collagen, elastic fibres, and reticular fibres.

Connective tissue is divided into four categories: connective proper, cartilage, bone, blood.

Connective tissue proper has two subclasses: **lose/loose/loss** and dense. The **former/formal/firmer** is divided into 1) areolar, 2) adipose, 3) reticular. The **later/ladder/latter** is divided into 1) dense regular, 2) dense irregular, 3) elastic.

Cartilage is composed of specialised cells called chondroblasts and, **alike/dislike/ unlike** other connective tissues, cartilage does not contain blood vessels. Cartilage is classified in three types: 1) elastic cartilage, 2) hyaline cartilage, and 3) fibrocartilage.

Bone tissue is also called the osseous tissue. It is relatively hard and lightweight in nature. It has high compressive strength, but poor **tensile/tonsil/tensely** strength, and

very low **share/sheer/shear** stress strength. The hard outer **lair/layer/lawyer** of bones is composed of compact bone tissue, which gives bones their smooth, white, and solid appearance, and accounts for 80% of the total bone mass of an adult skeleton. **Filing/feeling/filling** the interior of the bone is the trabecular bone tissue (an open cell porous network also called **cancellus/cancellous/cancerous** or spongy bone), which is composed of a network of **rote/rod/rode** and plate-like elements that make the overall organ lighter and allow room for blood vessels and marrow.

Blood is considered a specialised form of connective tissue. It is a bodily fluid that delivers necessary substances to the cells and transports metabolic **waste/waist/west** products away from those same cells. It is an atypical connective tissue since it does not bind, connect, or network with any body cells.²

1.13. The words 'cell' and 'tissue' have several meanings. Read the sentences below and try to provide, in your own words, a definition for these terms in the given contexts. The first one has been done for you:

1. The hexagonal cells of a honeycomb house larvae and store honey.

→ cell = a small compartment

2. In this prison, only one inmate is assigned to each cell.

→ cell =

3. Despite the efforts of the intelligence services, the terrorist cell could not be neutralised.

→ cell =

4. A fuel cell produces electricity and, in addition, water, heat and varying amounts of nitrogen dioxide.

→ cell =

5. Call me on my cell after 6 pm.

→ cell =

6. As he started to sneeze, he needed a tissue.

→ tissue =

7. The shop assistant wrapped my crystal bowl in tissue paper.

→ tissue =

8. The whole article was merely a tissue of lies.

→ tissue =

² Adapted from: Anon, *Anatomy and Physiology*, 2020

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