

ΠΡΟΤΥΠΟ ΓΕΝΙΚΟ ΛΥΚΕΙΟ ΕΥΑΓΓΕΛΙΚΗΣ ΣΧΟΛΗΣ ΣΜΥΡΝΗΣ



Επιτραπέζια Παιχνίδια σε Θεματική Βιοχημείας στην Αγγλική Γλώσσα

Όνοματεπώνυμο/α και Ειδικότητα Εκπαιδευτικού/ων	1. ΑΡΝΑΟΥΤΗ ΕΙΡΗΝΗ (ΠΕ06 ΑΓΓΛΙΚΩΝ) 2. ΑΓΓΕΛΙΔΟΥ ΧΡΥΣΗ (ΠΕ04.02 ΧΗΜΙΚΟΣ)				
Όνομασία Υλικού	Επιτραπέζια Παιχνίδια σε Θεματική Βιοχημείας στην Αγγλική Γλώσσα				
Τάξεις στις οποίες απευθύνεται	ΛΥΚΕΙΟ				
Απαιτούμενες ώρες	3-6 διδακτικές ώρες				
Περιγραφή Αντικειμένου					
<p>Το συγκεκριμένο υλικό αναπτύχθηκε με σκοπό οι μαθητές του Λυκείου να μπορούν με παιγνιώδη τρόπο να κάνουν επανάληψη την ύλη της Βιολογίας. Το συγκεκριμένο υλικό μπορεί να αποτελέσει διδακτικό υλικό με συγκεκριμένους μαθησιακούς στόχους που αναφέρονται αναλυτικά παρακάτω. Τα παραγόμενα επιτραπέζια παιχνίδια προτείνεται να χρησιμοποιούνται είτε τμηματικά, μετά την ολοκλήρωση της αντίστοιχης θεματικής ενότητας, είτε στο σύνολό τους, μετά την ολοκλήρωση όλων των θεματικών ενοτήτων. Επίσης, μπορούν να χρησιμοποιηθούν και στο μάθημα της αγγλικής γλώσσας, για να συμβάλλουν στην εκμάθηση Βιολογίας στη διεθνή αυτή γλώσσα, με την εφαρμογή της μεθόδου CLIL (Content and Language Integrated Learning).</p> <p>Οι θεματικές ενότητες που κατηγοριοποιείται η ύλη αφορούν τα εξής θέματα: α) Πρωτεΐνες, β) Ένζυμα, γ) Νουκλεϊκά Οξέα, δ) Μοριακή Γενετική, ε) Υδατάνθρακες & Λιπίδια, στ) Κυτταρική Διαίρεση, ζ) Κύτταρο-Κυτταρικά Οργανίδια.</p> <p>Τα επιτραπέζια παιχνίδια είναι τα εξής: σταυρόλεξα και τρία επιτραπέζια παιχνίδια γνώσεων “Prove your knowledge”, “Avoid them” και “Name it!”.</p> <p>Σημείωση: Καθότι τα σταυρόλεξα αναπτύχθηκαν με τη συνεργασία μαθητών Β’ Λυκείου και τη σύμφωνη γνώμη των γονέων τους, τα σταυρόλεξα παρατίθενται με τα ονόματά τους για λόγους πνευματικών δικαιωμάτων. Οι εν λόγω μαθητές είναι πλέον ενήλικες.</p>					
Περιγραφή Επιδιωκόμενων Στόχων					
<p>I. Ενεργοποίηση των μαθητών για εκμάθηση της ύλης της Βιολογίας μέσω ενός πιο προσφιλή και παιγνιώδη τρόπου. Σε κάθε περίπτωση, το υλικό στοχεύει σε γενικά και ειδικά μαθησιακά αποτελέσματα.</p> <p>Ενδεικτικά αναφέρουμε στα γενικά μαθησιακά αποτελέσματα:</p> <p>α) Την εξοικειωσή του μαθητή με τον επιστημονικό τρόπο σκέψης και την πρόκληση του ενδιαφέροντος του για αναζήτηση της γνώσης σε θέματα που αφορούν τη Βιολογία.</p> <p>β) Την ανάπτυξη της ικανότητας του μαθητή να συλλέγει πληροφορίες από επιστημονικές πηγές ή πλήρεις μελέτες αξιοποιώντας και την τεχνολογία της Πληροφορικής, όπου αυτό είναι δυνατό και τον έλεγχο πληροφοριών.</p>					

Ειδικότερα δε στα κεφάλαια:

1. Χημική Σύσταση του Κυττάρου

α) Την δυνατότητα να αναφέρει τις σπουδαιότερες ομάδες βιολογικών μακρομορίων (πρωτεΐνες, νουκλεϊικά οξέα, υδατάνθρακες και λιπίδια) και τους δομικούς λίθους από τους οποίους αυτά αποτελούνται.

β) Την ικανότητα να διακρίνει ομοιότητες στον τρόπο με τον οποίο σχηματίζονται τα διάφορα είδη μακρομορίων.

2. Κύτταρο: Η θεμελιώδης μονάδα της ζωής

α) Να ταυτοποιεί τις δομές του ενός κυττάρου

β) Να διακρίνει τις ομοιότητες και τις διαφορές μεταξύ ενός φυτικού και ενός ζωικού κυττάρου.

γ) Να συσχετίζει τα ιδιαίτερα χαρακτηριστικά και τις λειτουργίες των φυτικών και ζωικών κυττάρων με τις ανάγκες που δημιουργεί στους αντίστοιχους οργανισμούς το περιβάλλον στο οποίο ζουν.

3. Γενετική

α) Να αναγνωρίζει ότι το γονίδιο αποτελεί τμήμα του DNA.

β) Να περιγράφει τον τρόπο μεταβίβασης του γενετικού υλικού και έκφρασης της γενετικής πληροφορίας.

γ) Να διακρίνει τις διαφορές μίτωσης και μείωσης.

II. Εμπλουτισμός λεξιλογίου στην αγγλική γλώσσα και εξοικείωση με την αντίστοιχη επιστημονική ορολογία

III. Βελτίωση στην εκφορά γραπτού και προφορικού λόγου στην αγγλική γλώσσα

IV. Έκθεση των μαθητών σε αυθεντικά πολυτροπικά γλωσσικά περιβάλλοντα

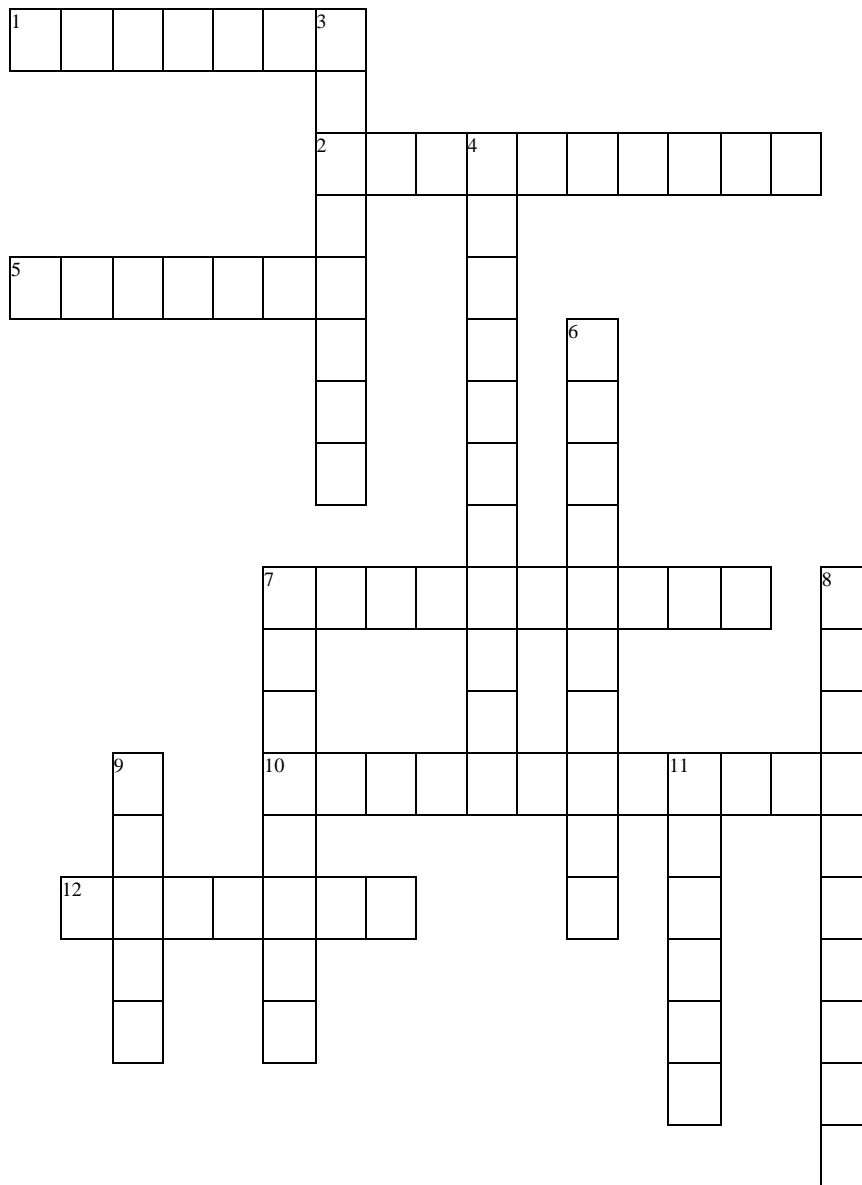
V. Ομαδοσυνεργατικός τρόπος μάθησης

ΣΤΑΥΡΟΛΕΞΑ ΒΙΟΛΟΓΙΑΣ

Οι μαθητές μπορούν να λύσουν τα σταυρόλεξα ατομικά ή ομαδικά, τόσο στην τάξη όσο και ως εργασία στο σπίτι. Παρέχονται σταυρόλεξα χωρισμένα σε θεματικές ενότητες και ακολουθούν οι λύσεις τους.

Proteins

by D. Diamantis, A. Georgoulas, M. Gritzapis, V. Vafeas



Across

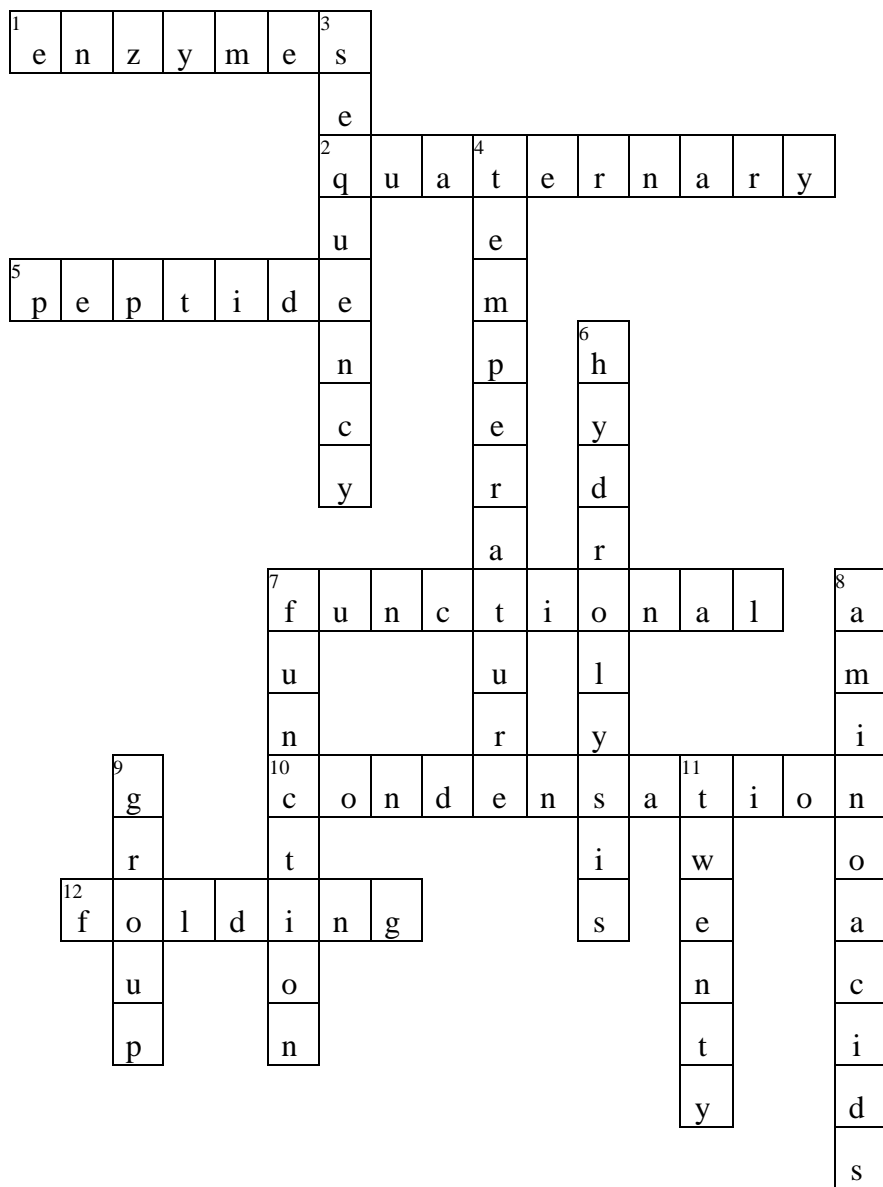
1. A well-known category of functional proteins is
2. What is the last form of structure that a protein may have?
5. What is the name of the bond between two amino-acids?
7. Proteins are divided into structural and
10. The process of uniting monomers in order to create a protein is called
12. The tertiary structure of the protein is its in space

Down

3. The primary structure of proteins is the of amino-acids.
4. A protein structure is influenced by its pH and
6. The process of splitting up proteins in order to create monomers is called
7. Denaturation is the phenomenon in which a protein loses its
8. The building components of proteins are the
9. The variable segment of an amino-acid is called side
11. How many amino-acids are essential for an organism?

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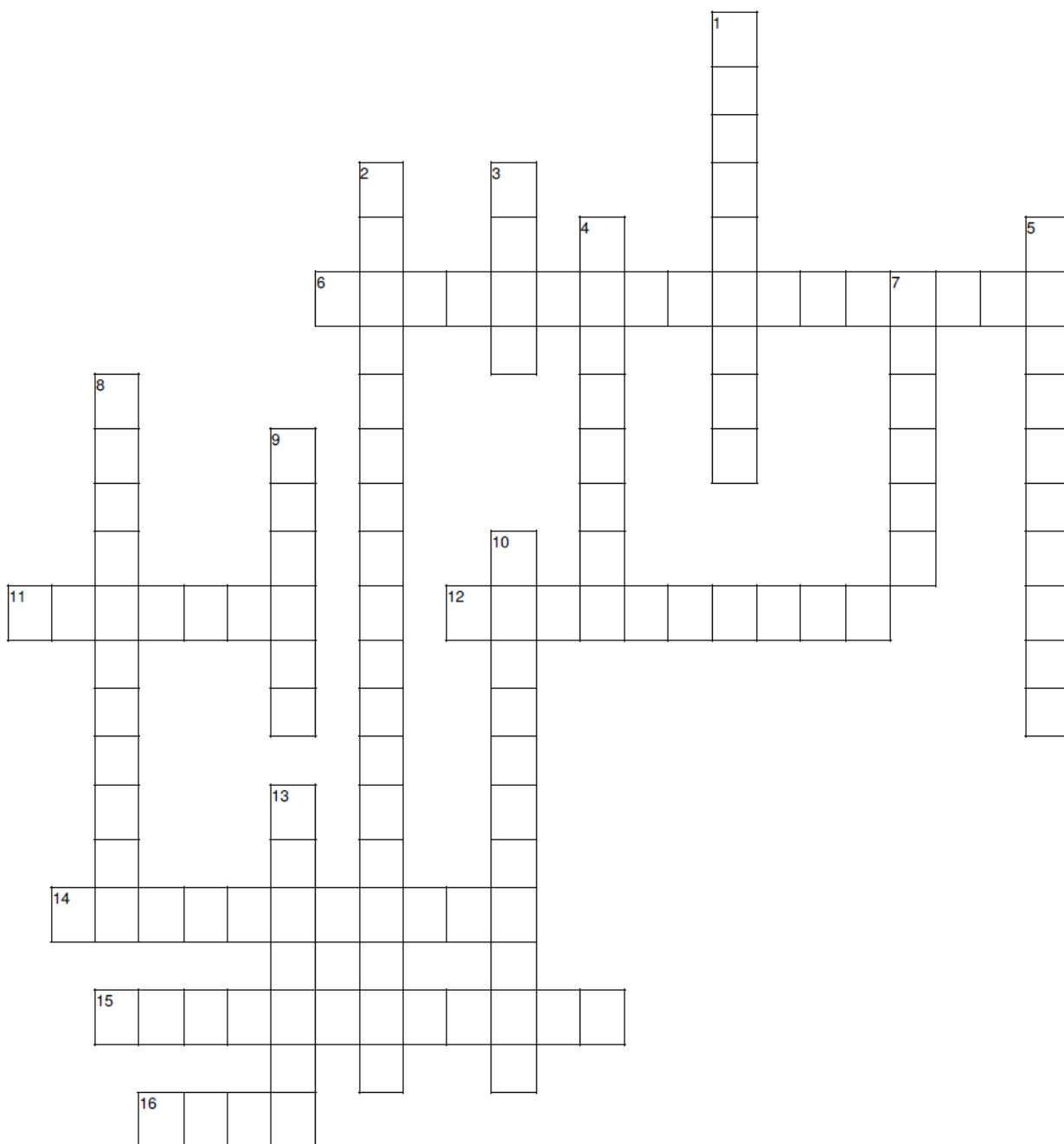
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Proteins by D. Paizis-Radoicovic, I. Pantazis-Dorizas, P. Papadopoulos, G. Papanikolaou-Dais



Across

- 6. What is the first-level organisation a protein can have?
- 11. How is a relatively small chain of amino acids called?
- 12. What do proteins consist of?
- 14. Apart from the acidity conditions (pH), due to what may a protein cease functioning?
- 15. What is the name of the procedure causing the ceasing of a protein functioning?

Down

- 1. How is the molecule consisting of two amino acids called?
- 2. What is the organisation of a protein consisting of only one chain that has achieved its final form?
- 3. What is the main source of proteins for humans?
- 4. Which type of secondary bonds do proteins found in hair have?
- 5. Which is the protein that carries oxygen to the body?

16. Which metal is an essential part of a functioning hemoglobin?

tissues?

7. What is the number of the most widespread protein components?

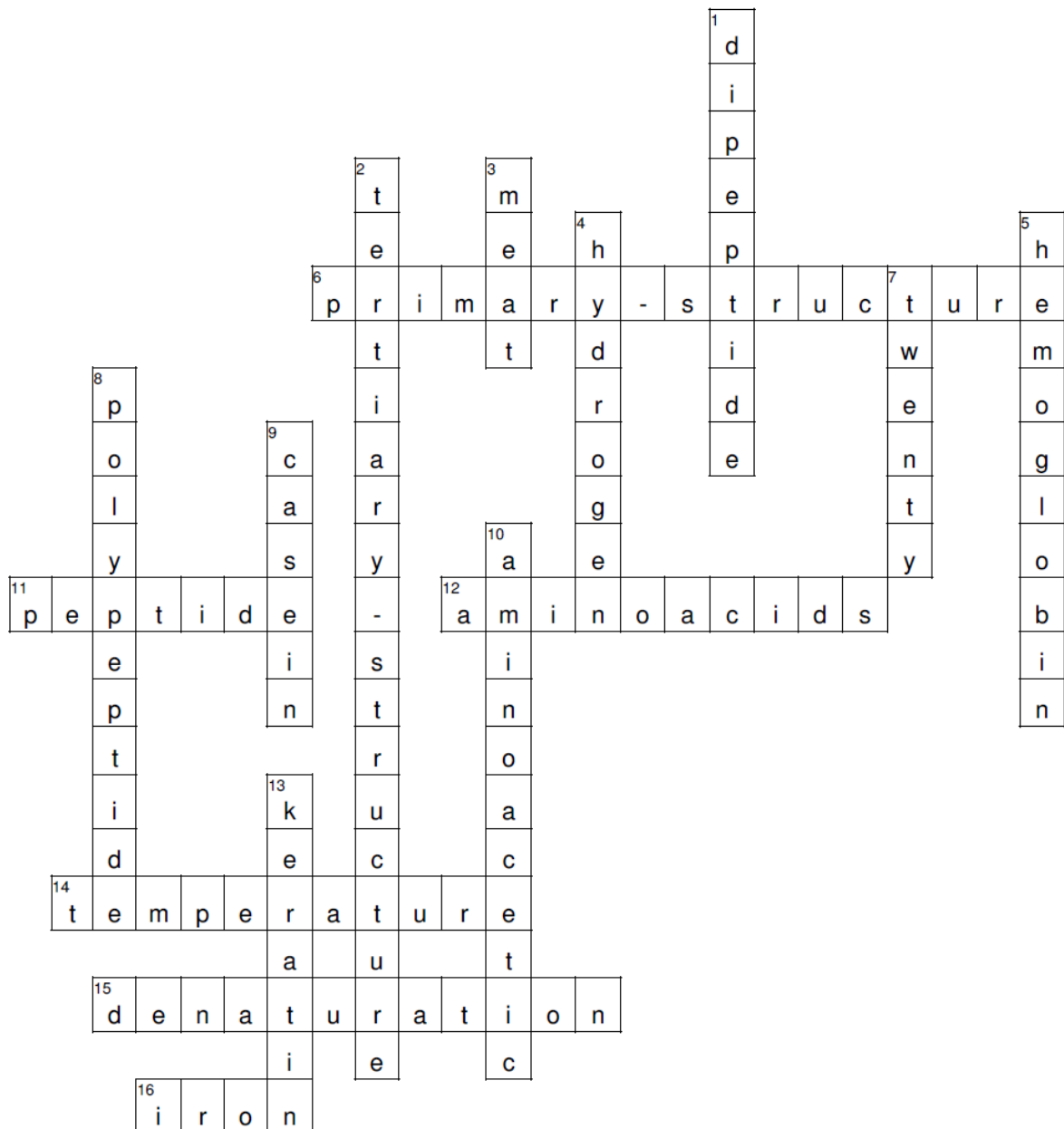
8. How is a peptide chain consisting of over 50 components called?

9. What is the name of the main protein of milk?

10. What is the name of the covalent bond between the components?

13. What is the name of the protein found in hair?

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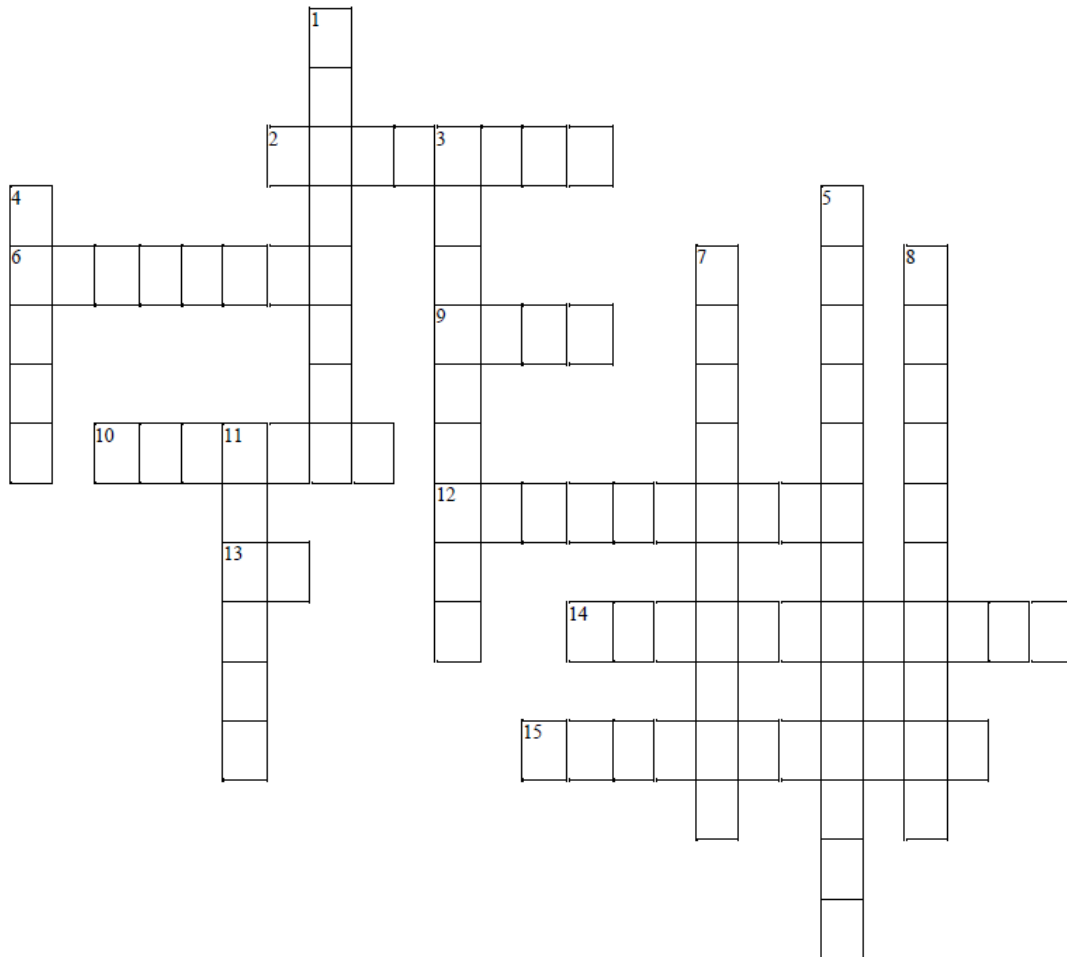
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ENZYMES

by P. Panigyrakis, G. Papanikolopoulos, K. Martis, K. Merkouris



Across

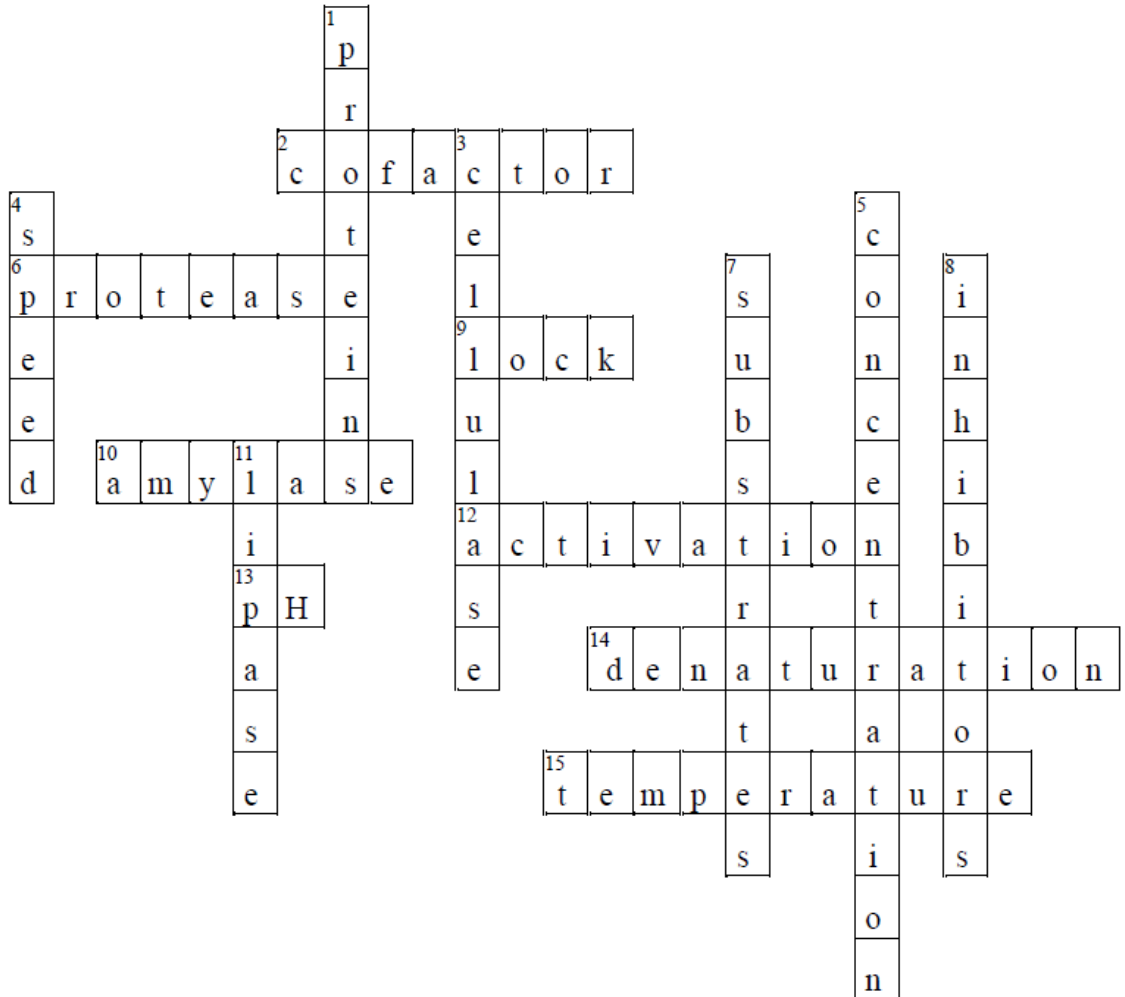
2. For enzymes to be functional they must be accompanied by a ...
6. The ... enzyme hydrolyzes fats.
9. Enzymes and substrates have a ...-key relation.
10. The ... enzyme hydrolyzes proteins.
12. Enzymes reduce ... energy.
13. For enzymes to function ... should be between 5 and 9.
14. It is caused by extreme values of PH and temperature.
15. The ... of the environment must be between 35.5 and 37.5 degrees Celsius for enzymes to function.

Down

1. Enzymes are a subcategory of ...
3. The ... enzyme hydrolyzes cellulose.
4. Enzymes increase the ... of reactions in the human body.
5. The enzyme activity is affected by its ...
7. When an enzyme is used the reactants are called ...
8. They affect adversely the enzyme activity.
11. The ... enzyme hydrolyzes starch into glucose.

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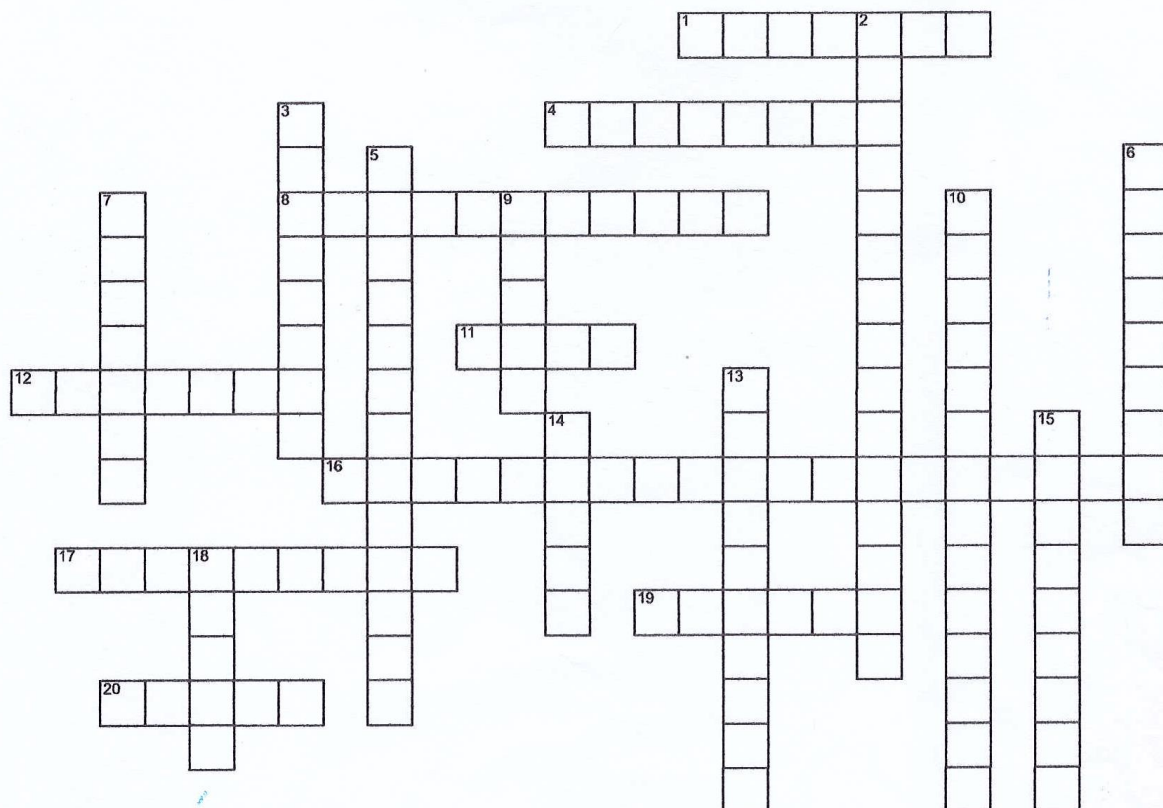
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NUCLEOTIDES

by G. Manioudaki, A. Milatou, I. Oikonomou and C. Panigyraki



ACROSS

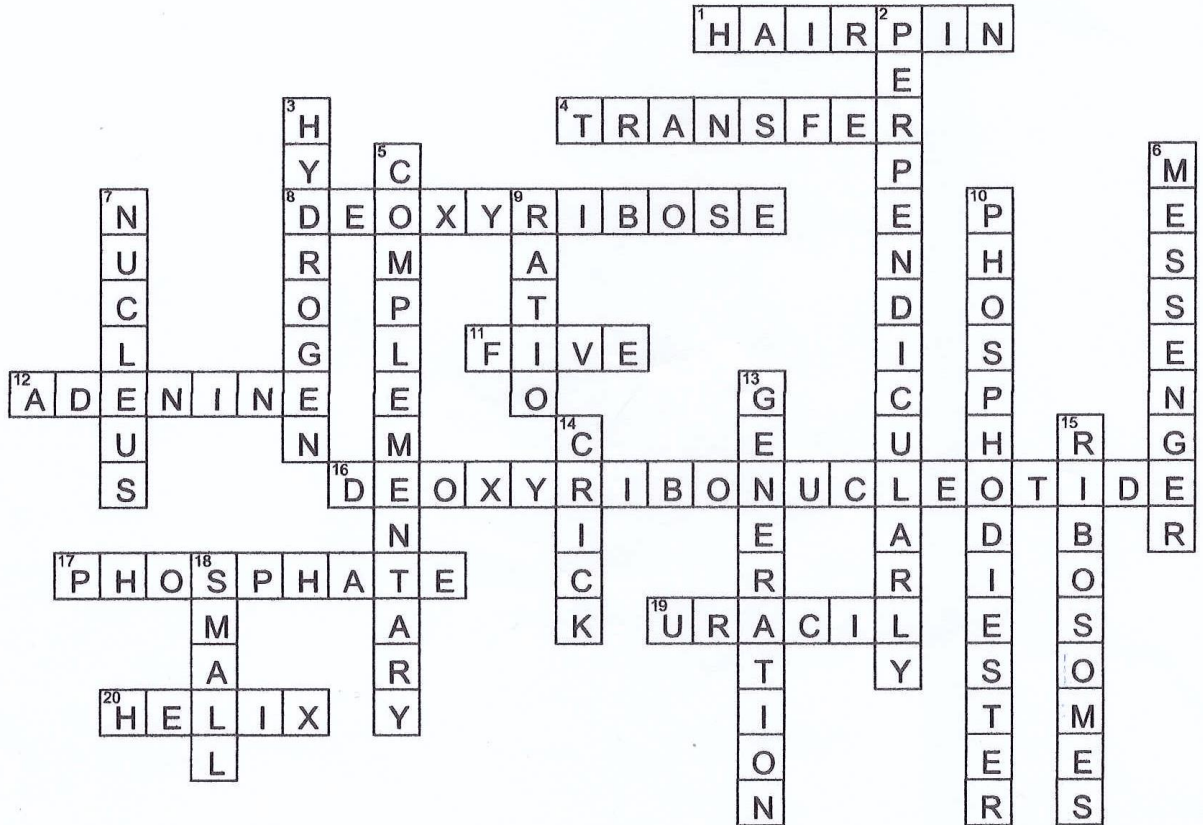
- 1 RNA is usually single-stranded, except for ... structured RNA.
- 4 ... RNA carries amino acids to the ribosomes.
- 8 Nucleotides of a DNA molecule contain a kind of sugar called ...
- 11 A nucleotide is composed of a sugar with ... carbon atoms.
- 12 Thymine is only paired with ...
- 16 The monomer unit that forms DNA molecules is called ...
- 17 The ... group is attached to the fifth (5') carbon atom of the sugar of each nucleotide.
- 19 Which nitrogenous base does not exist in DNA molecules?
- 20 DNA molecules consist of two strands twisted around each other to form a double ...

DOWN

- 2 Nitrogenous bases align ... to the axis of the DNA molecule.
- 3 The two strands of DNA are held together by ... bonds.
- 5 Cytosine is paired with guanine according to the ... base pairing rule.
- 6 ...RNA carries information from the nucleus to the ribosomes.
- 7 DNA is primarily found in the ... of eukaryotic cells.
- 9 On DNA molecules there is a specific ... of guanine to cytosine bases.
- 10 Two nucleotides are connected with a ... bond.
- 13 DNA passes genetic information on to the next ...
- 14 The structure of DNA was established by Watson and ...
- 15 rRNA is found in ...
- 18 sRNA stands for ... ribonucleic acid.

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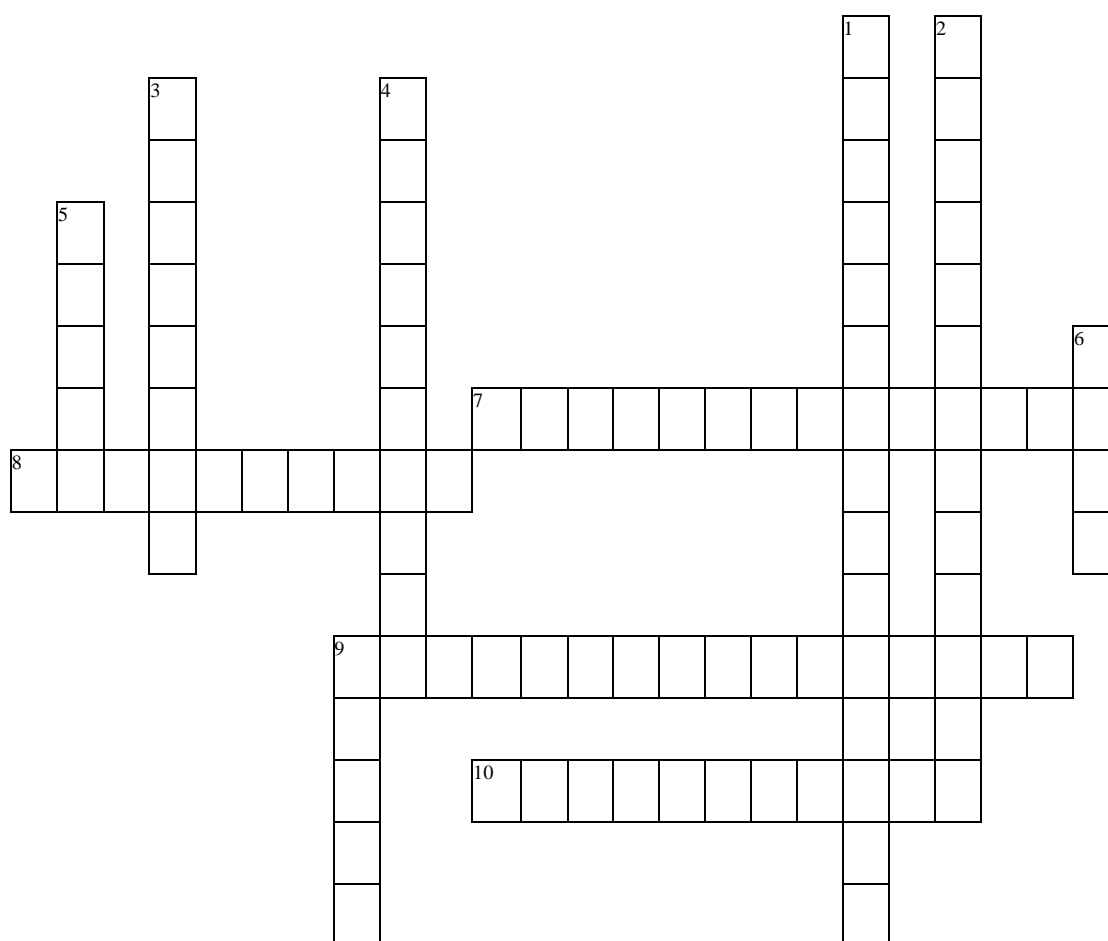
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Molecular Genetics

by T. Aggeli, M. Avramidis, V.-L. Dimitrakopoulou, L. Exarchou



Across

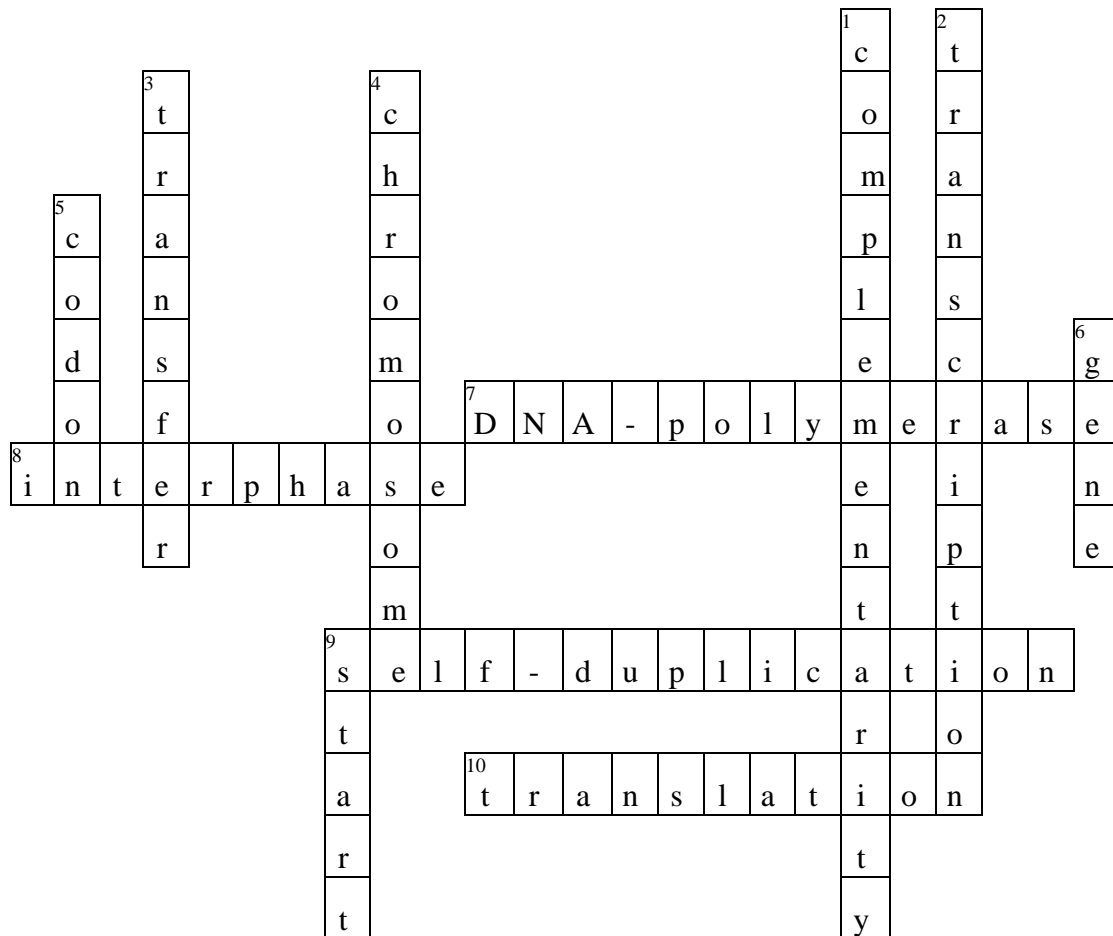
7. Which enzyme contributes to the duplication of the two clones of the DNA?
8. Period between two cellular divisions.
9. ... precedes the transcription process.
10. Process of protein-making in the ribosomes.

Down

1. The duplication of two clones of the DNA is done according to the....of the two bases.
2. Process of RNA production.
3. RNA that takes the information from the cell nucleus to the cytoplasm.
4. Concentrated form of chromatin.
5. The amino acid that is coded by three nucleotides.
6. The sequence of the nucleotides in the transcribed part of the DNA.
9. Methionine is the codon of....

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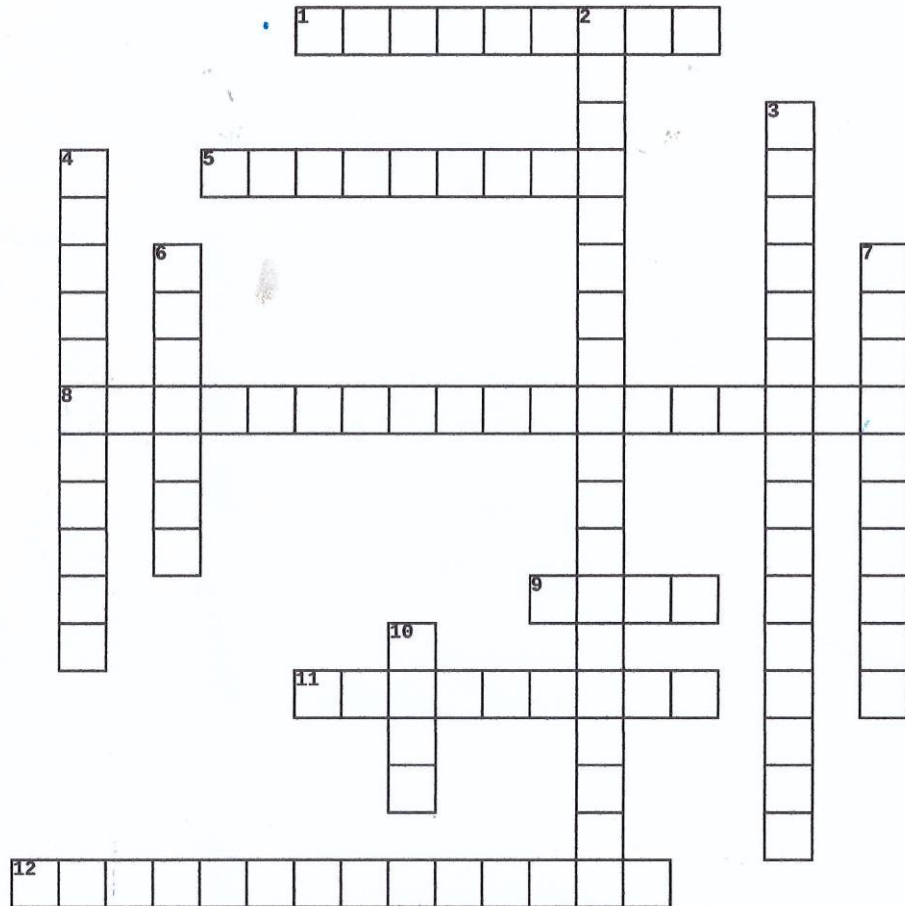
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Molecular Genetics by M.Bouza, A.Nastou, A.Oikonomou, S.Pagoni

Complete the crossword below



Created with TheTeachersCorner.net [Crossword Puzzle Generator](#)

Across

1. Proteins are synthesized in the...
5. This is how we call the typical nucleotides triad of the t-RNA.
8. What's another name for the cell cycle?
9. How many types of RNA exist?
11. This is what we call the DNA molecule during the interphase.
12. What is the enzyme that divides the strands from the double strand molecule of the DNA called?

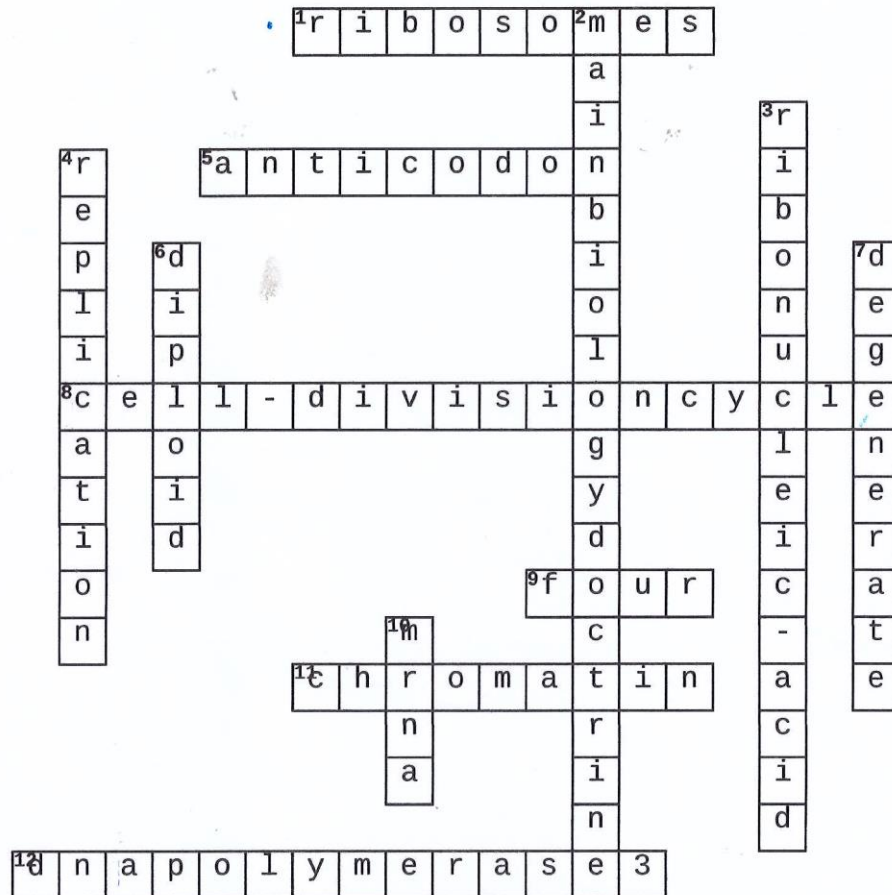
Down

2. What is the name of the process that indicates the direction in which the genetic information flows?
3. What is the single-strand genetic material called?
4. The self-duplication of the DNA molecule is called...
6. This is what we call the cells that they have their chromosomes and their genes in pairs.
7. The genetic code is , among other things,...
10. The encoded information is transcribed in the molecule of ...

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Molecular Genetics by M.Bouza, A.Nastou, A.Oikonomou, S.Pagoni

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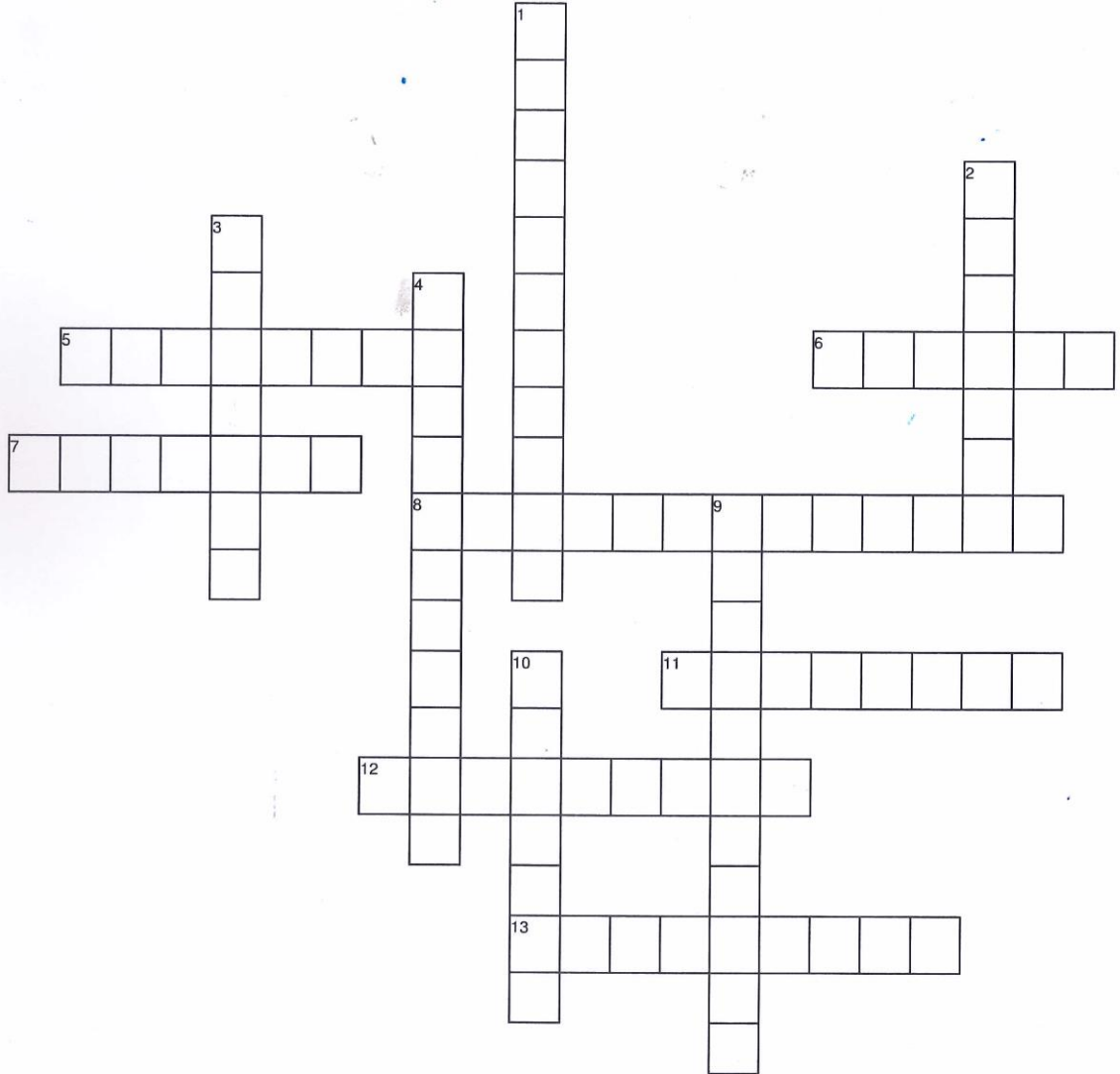
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1. Proteins are synthesized in the... (**ribosomes**)
5. This is how we call the typical nucleotides triad of the t-RNA. (**anticodon**)
8. What's another name for the cell cycle? (**cell-division cycle**)
9. How many types of RNA exist? (**four**)
11. This is what we call the DNA molecule during the interphase. (**chromatin**)
12. What is the enzyme that divides the strands from the double strand molecule of the DNA called? (**dnapolymerase3**)

Down

2. What is the name of the process that indicates the direction in which the genetic information flows? (**mainbiologydoctrine**)
3. What is the single-strand genetic material called? (**ribonucleic-acid**)
4. The self-duplication of the DNA molecule is called... (**replication**)
6. This is what we call the cells that they have their chromosomes and their genes in pairs. (**diploid**)
7. The genetic code is , among other things,... (**degenerate**)
10. The encoded information is transcribed in the molecule of ... (**mrna**)

Carbohydrates and Lipids by M.Androni,C.Giappas,N.Gourgouletis,N.Zaravinou



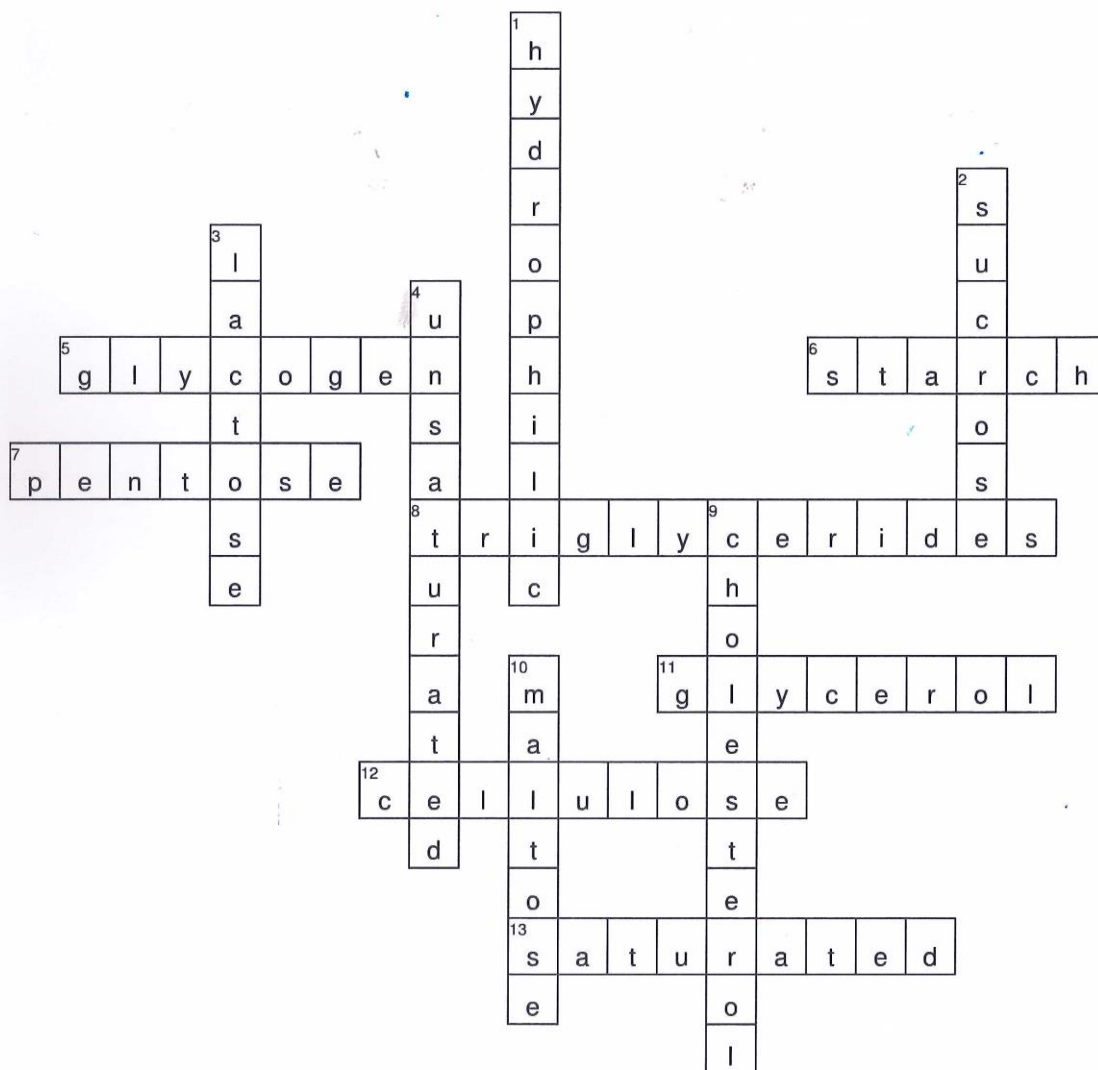
Across

5. Saving polysaccharide of animals and fungi.
6. Saving polysaccharide of plants.
7. Monosaccharide that takes part in the formation of ribonucleotides or deoxyribonucleotides.
8. The second designation for neutral fat.
11. The simple triglycerides consist of a molecule of... combined with three molecules of fatty acids.
12. Polysaccharide which is an ingredient of the cell wall (domestic polysaccharide).
13. Type of fat which is often found in animals and includes only simple bonds.

Down

1. The head of the molecule of phospholipids which has a special feature concerning water.
2. Disaccharide which is an ingredient of fruits and is the main glucose source for animals.
3. Disaccharide that is formed from the combination of the two monosaccharides glucose and galactose.
4. Type of fat which is often found in plants,tends to remain in a liquid form under normal conditions.
9. Steroid which may cause arteriosclerosis.
10. Disaccharide which is the result of starch degradation during the process of digestion.

Carbohydrates and Lipids by M.Androni,C.Giappas,N.Gourgouletis,N.Zaravinou



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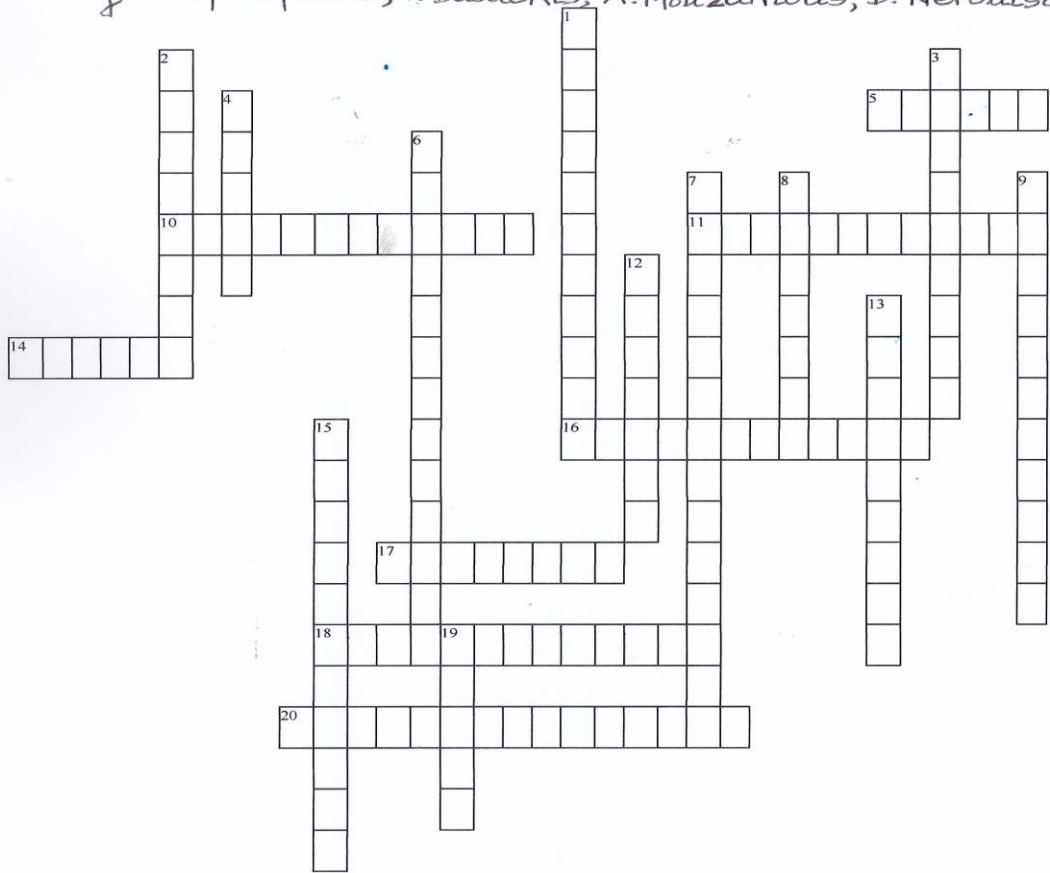
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Carbohydrates & Lipids

by N. Papadopoulos, P. Basdekis, A. Mouzakiotis, D. Neroutsos



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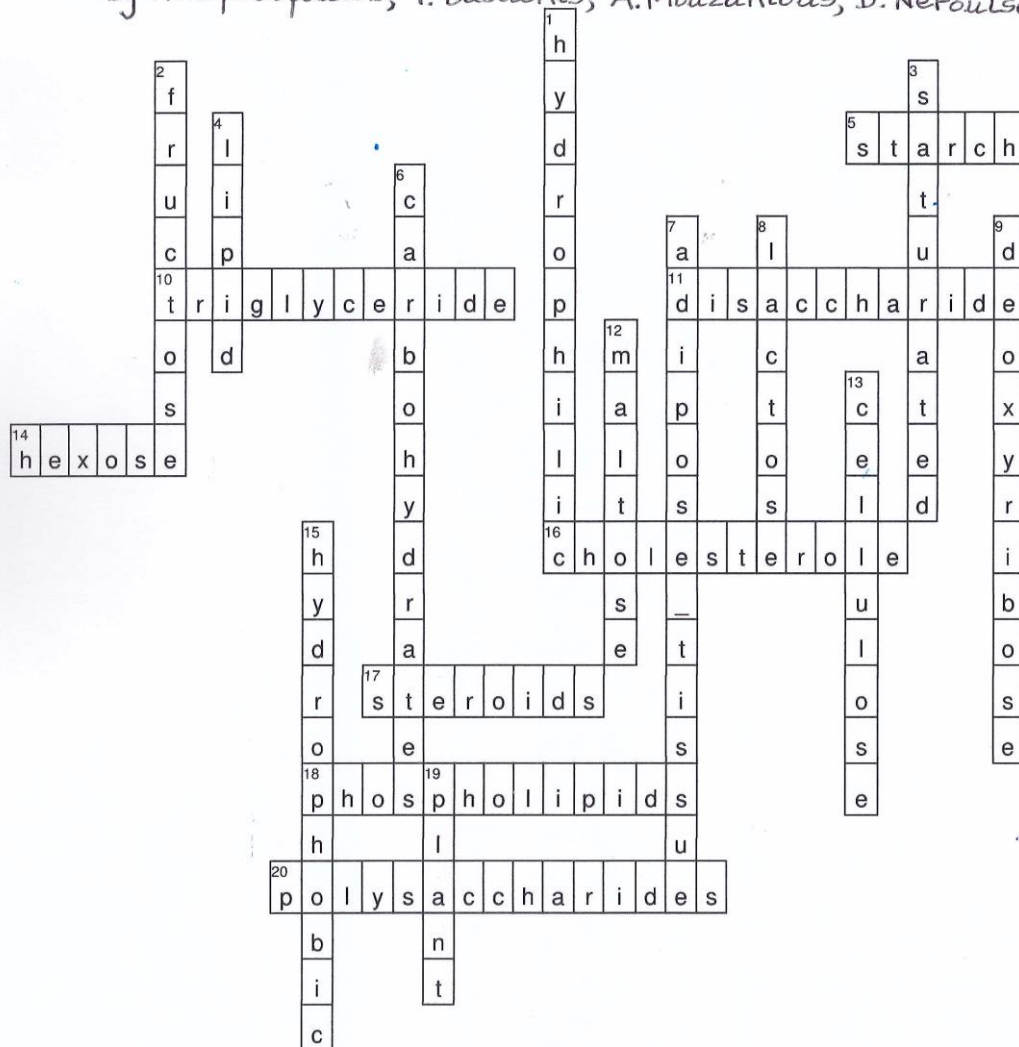
5. The most important carbohydrates are glycogen, glucose and ...
 10. Alternative name for neutral fat.
 11. Carbohydrate consisting of two monosaccharides.
 14. Monosaccharide consisting of six carbon atoms.
 16. The most well-known steroid.
 17. Category of fat that differs in structure when compared to the other two.
 18. Main constituent of the cell membranes.
 20. Cellulose, starch and glycogen are main ...

Down

1. The head of a phospholipid is ...
 2. Hexose that is a constituent of sugar.
 3. Characteristic of fatty acids that exist in plant cells.
 4. Structural functional constituent of the cell.
 6. Source of energy for the cell.
 7. The main lipid store.
 8. Sugar that the milk contains.
 9. ... participates in DNA synthesis.
 12. Main disaccharide.
 13. The most well-known structural carbohydrate.
 15. The tails of a phospholipid are ...
 19. Starch exists in ... cells.

Carbohydrates & Lipids

by N. Papadopoulos, P. Basdekis, A. Mouzakiotis, D. Neroutsos



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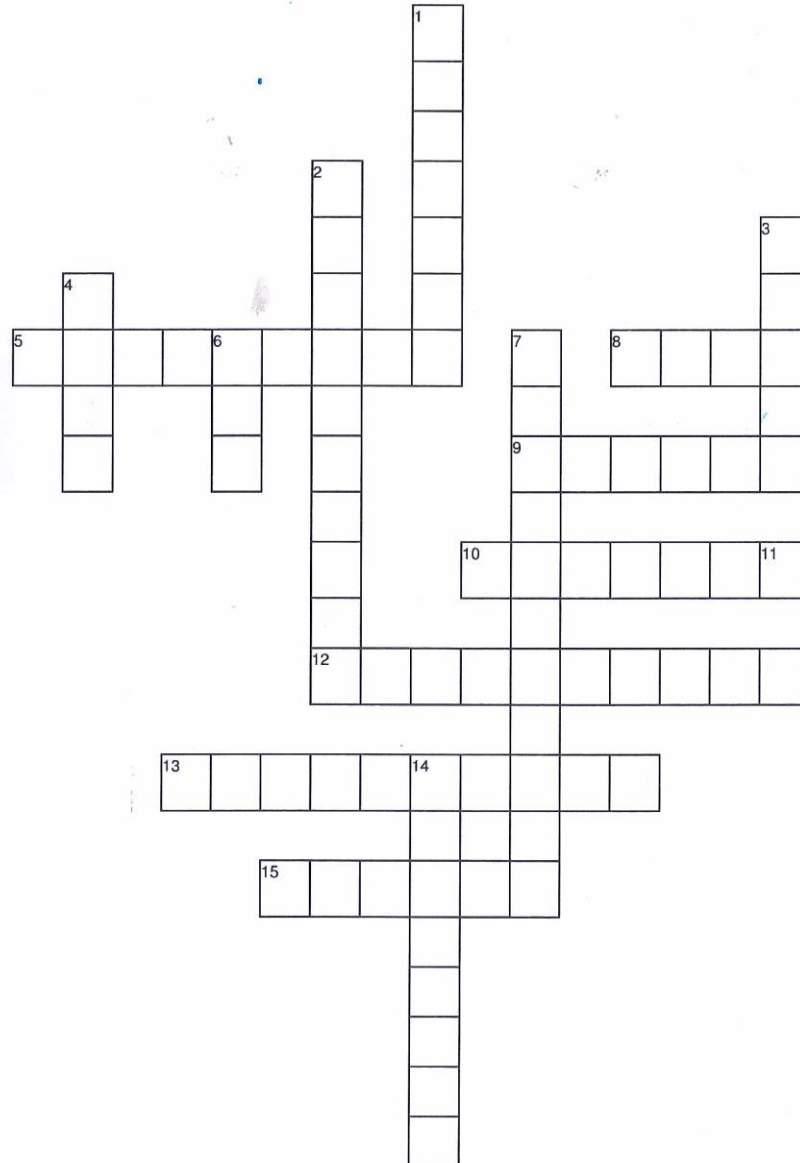
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14. Monosaccharide consisting of six carbon atoms.
16. The most well-known steroid.
17. Category of fat that differs in structure when compared to the other two.
18. Main constituent of the cell membranes.
20. Cellulose, starch and glycogen are main ...

Down

1. The head of a phospholipid is ...
2. Hexose that is a constituent of sugar.
3. Characteristic of fatty acids that exist in plant cells.
4. Structural functional constituent of the cell.
6. Source of energy for the cell.
7. The main lipid store.
8. Sugar that the milk contains.
9. ... participates in DNA synthesis.
12. Main disaccharide.
13. The most well-known structural carbohydrate.

15. The tails of a phospholipid are ...
19. Starch exists in ... cells.

Mitosis-Meiosis by I.Gkogiannos, E.Giakoumatos, T.Anagnostopoulos, N.Antzoulatos



Across

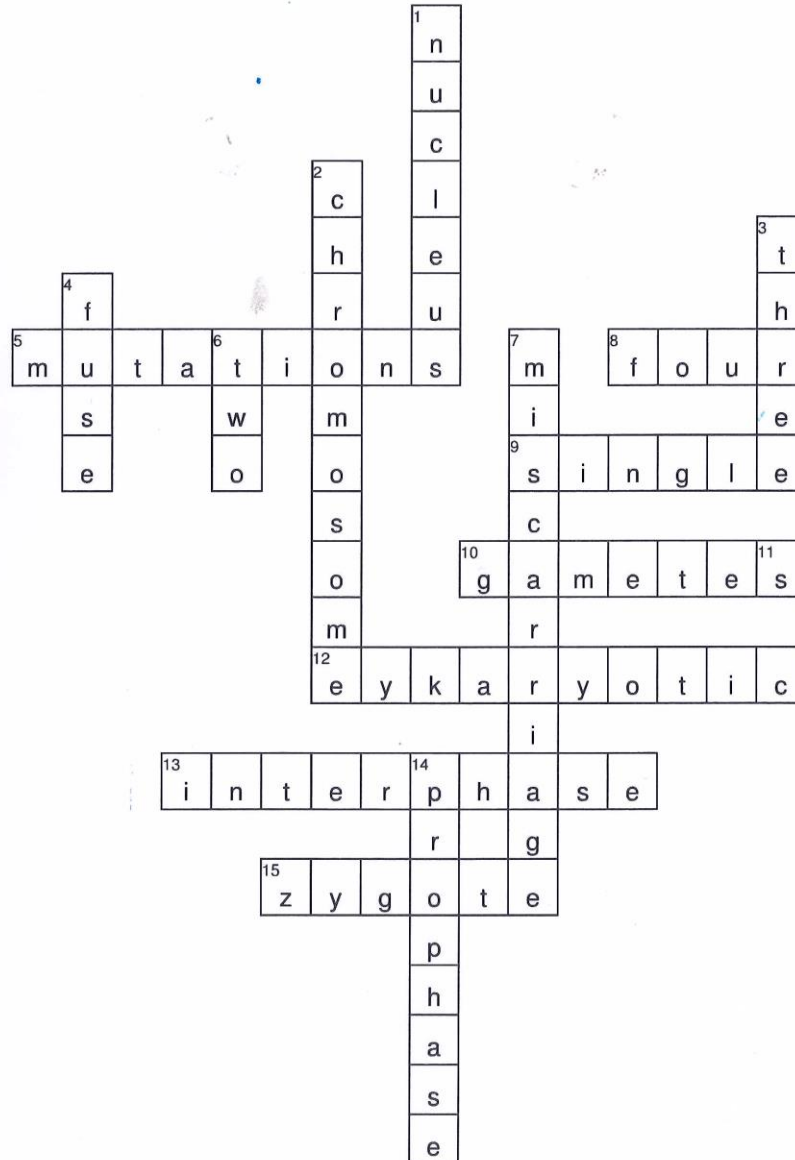
5. Errors during mitosis might cause ...
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10. The products of meiosis are called ...
12. Mitosis occurs only in ... cells.
13. ... is divided into G1, S and G2.
15. Gametes fuse to form a diploid ...

Down

1. Mitosis is the division of the ...
2. Meiosis reduces the ... number by half.
3. Interphase is divided into ... phases.
4. Because the number of chromosomes is halved during meiosis, gametes can ... (fertilization)
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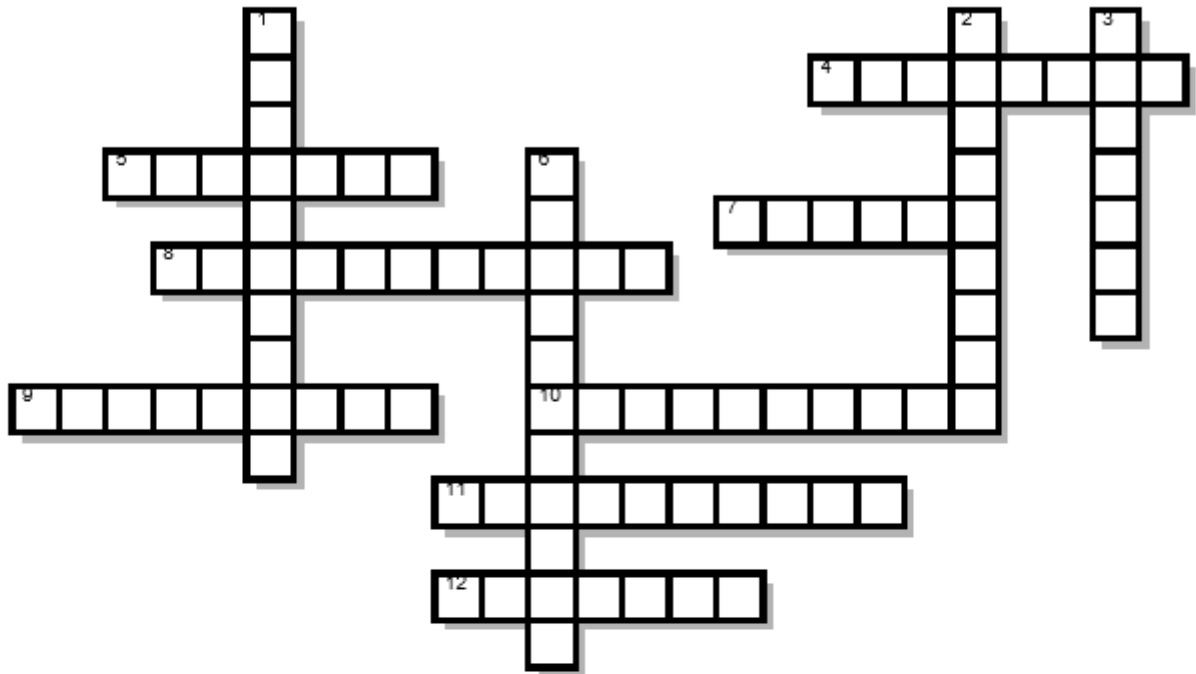
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Mitosis - Meiosis



ACROSS

- 4 Animal cells undergo an "open" mitosis, where the nuclear ... breaks down before the chromosomes separate.
- 5 ... is the part of the cell cycle when replicated chromosomes are separated into different nuclei.
- 7 Gametes can fuse to form a diploid ... that contains two copies of each chromosome, one from each parent.
- 8 Mitosis cannot occur in ... cells.
- 9 A subset of recombination events results in crossovers, which create physical links known as ...
- 10 ... is the phase of the cell cycle in which a typical cell spends most of its life.
- 11 Errors in meiosis resulting in ... are the leading known cause of miscarriage and the most frequent genetic cause of developmental disabilities.
- 12 ... is a specialized type of cell division that reduces the chromosome number by half.

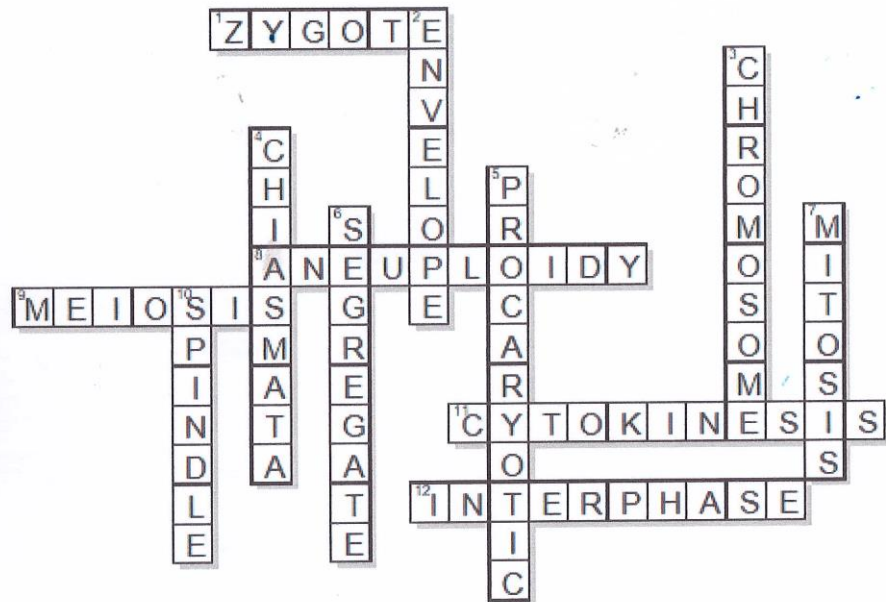
DOWN

- 1 A DNA molecule with part or all of the genetic material of an organism is called:
- 2 In most organisms, these links are essential to direct each pair of homologous chromosomes to ... away from each other during Meiosis I.
- 3 During mitosis, the chromosomes, which have already duplicated, condense and attach to ... fibres that pull one copy of each chromosome to opposite sides of the cell.
- 6 ... is the division of a eukaryotic cell in two daughter cells.

George Nikiforakis
Miaris John
Tsironis Christos

Mitosis - Meiosis

By George Nikiforakis, Miaris John, Tsironis Christos



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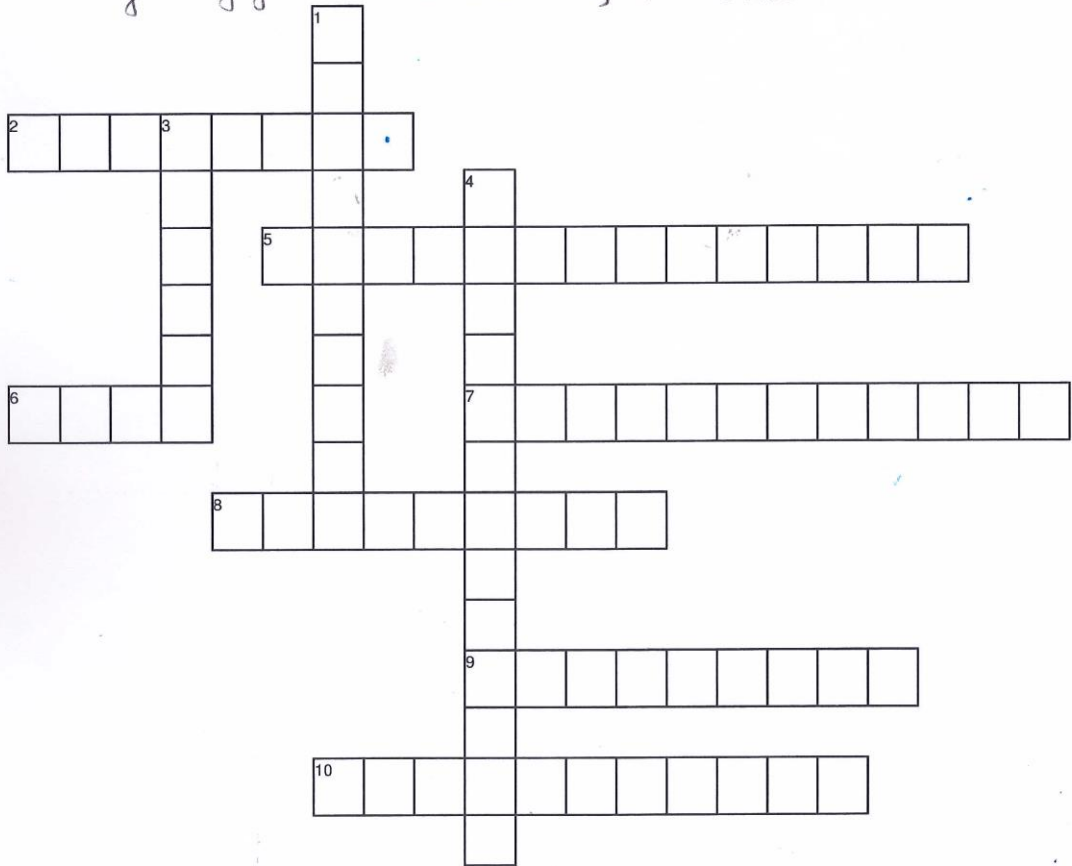
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Cellular organelles

by P. Agogiatis, P. Emmanouil, S. Galanos



Across

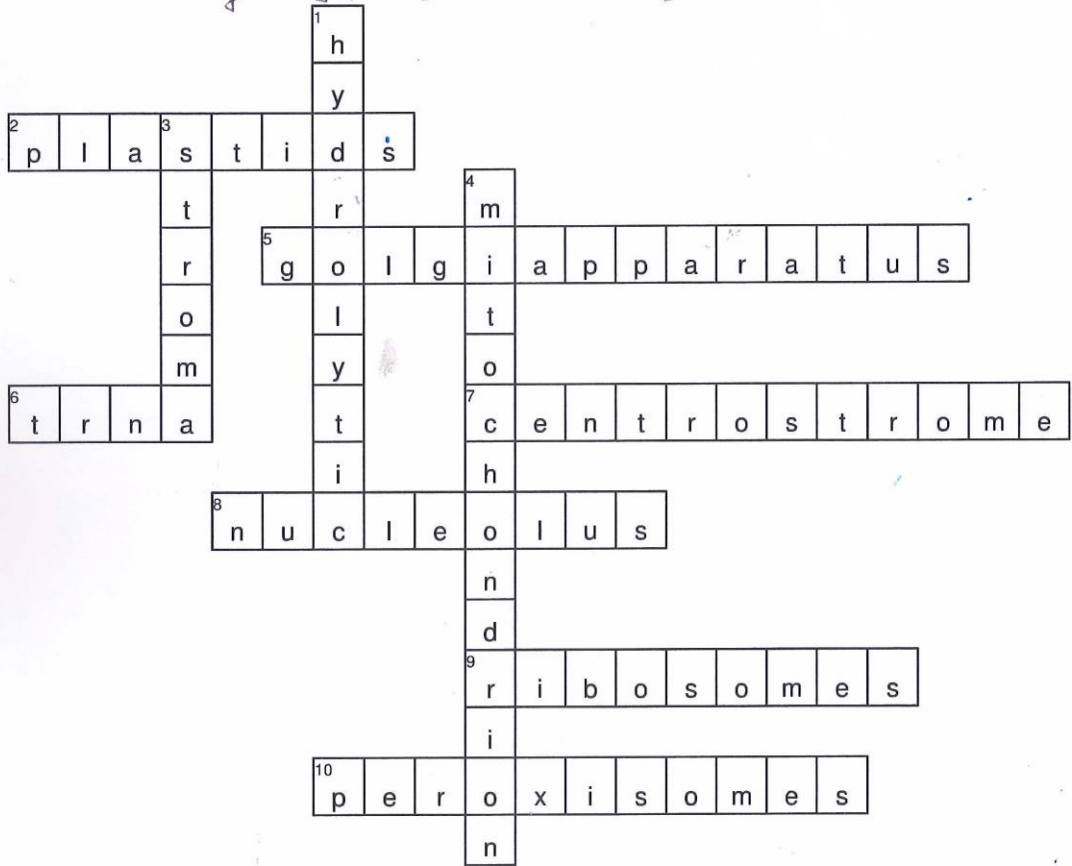
2. That is how we call double-membrane organelles.
5. Proteins take their final form in it.
6. It carries amino acids.
7. It has a key role in the mitosis of animal cells.
8. Dome inside the nuclear envelope.
9. They contain a high amount of rRNA.
10. They contribute to the detoxification of the body from alcohol.

Down

1. The lysosomes contain this type of enzymes.
3. Colorless fluid within the chloroplast.
4. Oxidative phosphorylation takes place in it.

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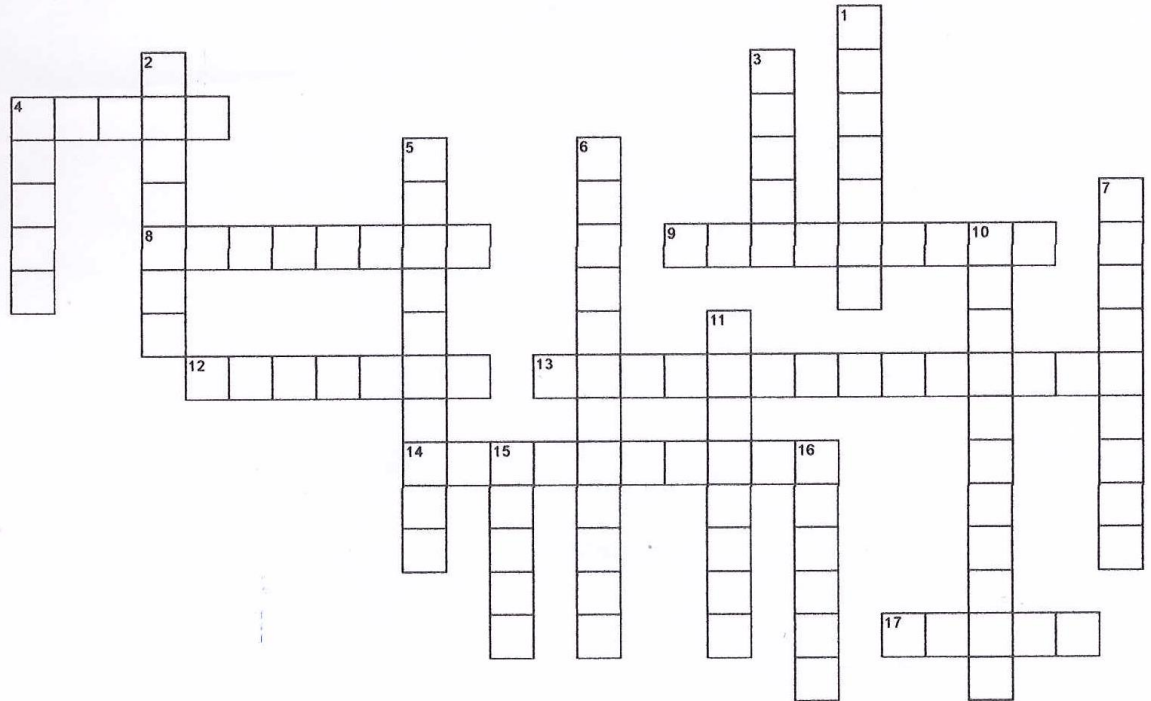
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By: A.Biniakou, S.Nastou, I.Papadopoulou, M.Papadopoulou



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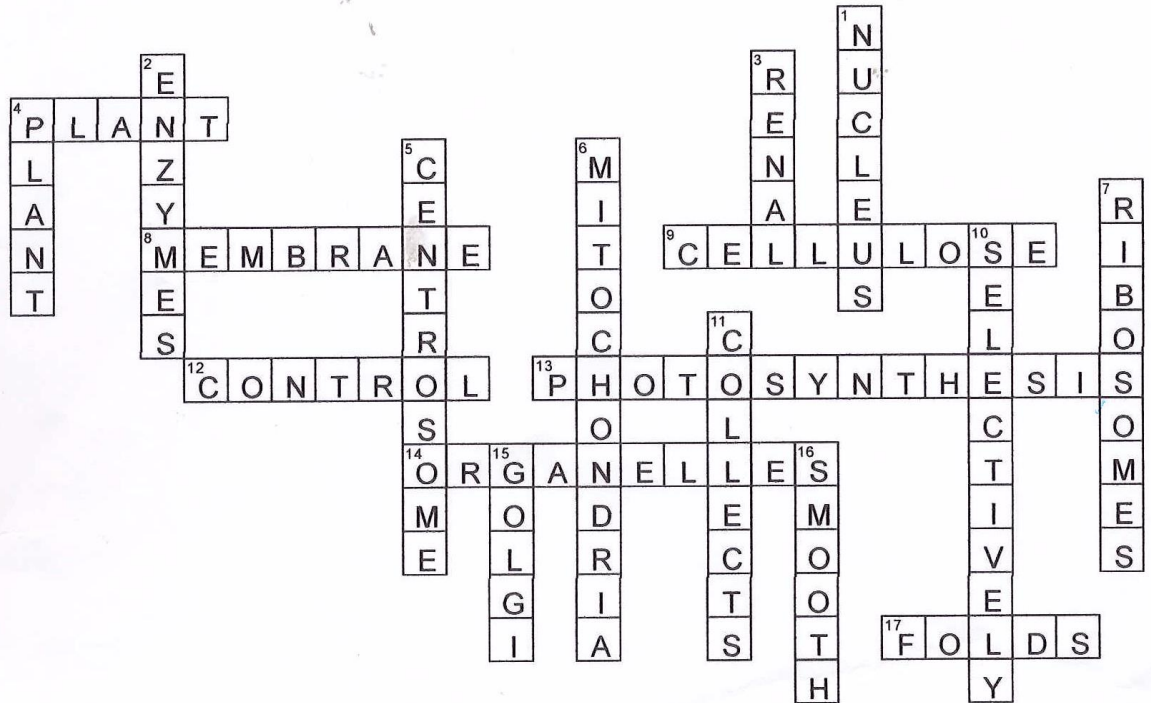
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- 8 The nucleus is surrounded by the nuclear.....
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- 12 The cell's nucleus is its.....center.
- 13 The.....takes place in the chloroplasts.
- 14 The different structures in the cytoplasm are called.....
- 17 In mitochondria, the outer membrane is smooth, while the inner membrane shows.....

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- 1 Genetic information is stored inside the.....
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- 3 The conversion of alcohol to acetaldehyde takes place in the peroxisomes of the hepatic and.....cells.
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- 5 The.....contributes to cell division.
- 6 The.....is the power house of the cell.
- 7are found on the surface of the rough endoplasmic reticulum.
- 10 The plasma membrane is.....permeable.
- 11 The golgi complex.....and modifies proteins.
- 15 The..... apparatus consists of groups of parallel flattened sacks.
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ΕΠΙΤΡΑΠΕΖΙΟ ΠΑΙΧΝΙΔΙ ΓΝΩΣΕΩΝ ΒΙΟΛΟΓΙΑΣ “Prove your Knowledge”

Ακολουθούν οι κανόνες του παιχνιδιού, το λογότυπό του και οι κάρτες με τις ερωτήσεις και τις απαντήσεις. Εκτός από αυτό το υλικό, χρειάζεται και μία κλεψύδρα για να παιχτεί το συγκεκριμένο παιχνίδι.

Σημείωση: Οι κάρτες μπορούν να είναι διπλής όψευς, από τη μία μεριά η ερώτηση-απάντηση και από την άλλη το λογότυπο του παιχνιδιού, καθώς και να πλαστικοποιηθούν. Όλες οι κάρτες μπορούν να φυλάσσονται σε ένα κουτί με μία κλεψύδρα, τους εκτυπωμένους κανόνες και το λογότυπο του παιχνιδιού έξω από το κουτί, για να είναι ένα ολοκληρωμένο επιτραπέζιο παιχνίδι.

“Prove your knowledge” Rules

The board game has cards on seven different thematic categories. The cards of each category have a different colour, as follows:

Colour categorization

Pink: Nucleotides

Light blue: Cellular Organelles

Yellow: Mitosis – Meiosis

Orange: Molecular Genetics

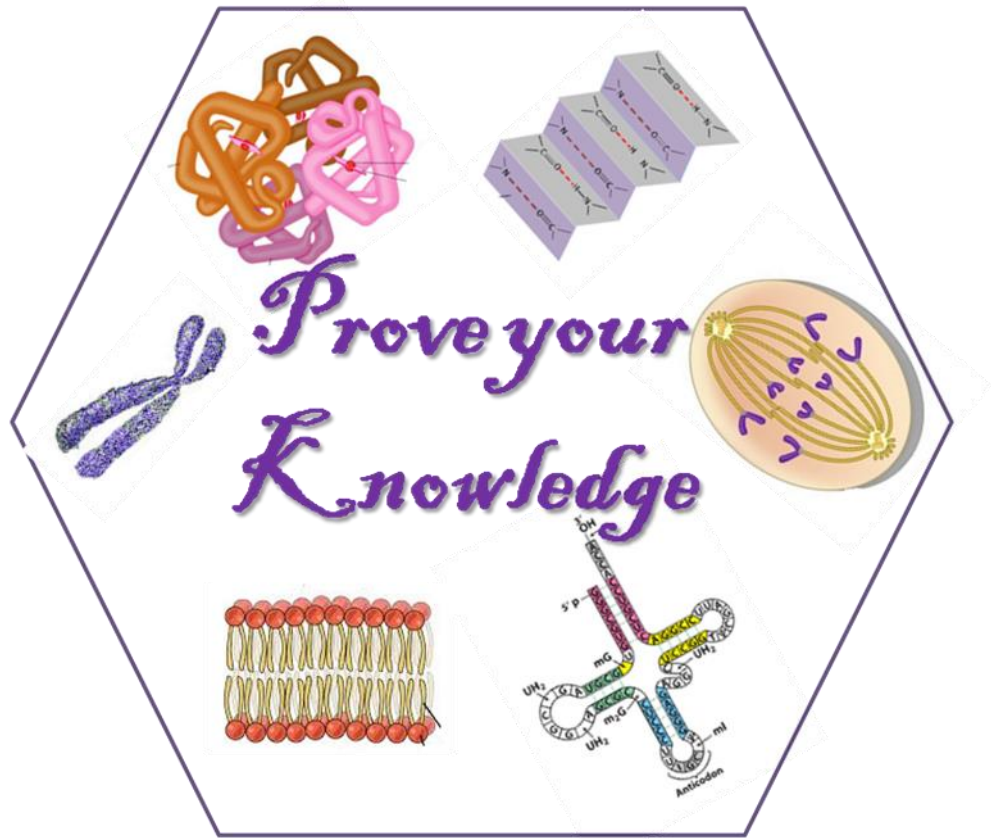
Light Green: Proteins

Light purple: Enzymes

Light grey: Carbohydrates & Lipids

The game is played in the following way:

1. We mix all the cards well.
2. The players are divided into teams of 3. There is also a moderator player.
3. One of the teams is selected by chance to start answering questions.
4. The moderator player chooses one card by chance and starts asking the question to the players of the answering team. This lasts for as long as the sand glass moves.
5. If a question is answered correctly, the answering team keeps it. Otherwise, the cards that are not answered are left out.
6. The turn of the teams moves clockwise.
7. After 3 rounds, the teams count the cards they have answered.
8. The team with the biggest number of answered cards is the winner.



<p>What are the main categories of carbohydrates?</p> <p>polysaccharides, disaccharides and monosaccharides</p>	<p>What are the three main categories of monosaccharides?</p> <p>triozes, pentozes, exozes</p>	<p>What are the substances of maltose?</p> <p>glucose and glucose</p>
<p>State two well-known polysaccharides.</p> <p>cellulose and starch</p>	<p>What are the substances of sucrose?</p> <p>glucose and fructose</p>	<p>What are the substances of lactose?</p> <p>glucose and galactose</p>
<p>What is the purpose of pentozes?</p> <p>They are the substances of nucleotides.</p>	<p>How many carbons has a trioze got?</p> <p>three</p>	<p>How many carbons has a pentoze got?</p> <p>five</p>
<p>How many carbons has an exoze got?</p> <p>six</p>	<p>What are the two main categories of pentoze?</p> <p>ribose and deoxyribose</p>	<p>How many glucoses does cellulose consist of?</p> <p>10.000</p>

<p>Enzymes are living organisms'...</p> <p>catalyst</p>	<p>In which part of the enzyme does the orientation of the molecule and substrate occur?</p> <p>active center</p>	<p>What do we call the energy needed by the reactants in order for the chemical reaction to take place?</p> <p>activation energy</p>
<p>In what percentage are the enzymes constituted by proteins?</p> <p>90%</p>	<p>Which is the common suffix of the enzyme's name?</p> <p>-ase</p>	<p>From what structure of the protein molecule do the enzymes determine their catalytic activity?</p> <p>the tertiary structure</p>
<p>How are the reactants called in a reaction involving enzymes?</p> <p>substrate</p>	<p>The enzymes have a great level of</p> <p>specialization</p>	<p>Some particular proteins have to be attached to a non-protein part in order to act as enzymes. How is this part called?</p> <p>co-factor</p>
<p>How many types of different reactions can an enzyme catalyze?</p> <p>one type</p>	<p>What affects the enzymic activity?</p> <p>temperature and pH</p>	<p>During the reaction enzymes remain ...</p> <p>unchanged</p>

<p>How are the temporary bond inhibitors called?</p> <p>reversible inhibitors</p>	<p>As a result of the fact that enzymes are proteins, their action is determined by their ... form.</p> <p>three-dimensional</p>	<p>For which approximate pH value does the pepsin enzyme have excellent activity?</p> <p>2</p>
<p>What is the enzyme secreted in pancreas called?</p> <p>pancreatic lipase</p>	<p>Which enzyme is missing when someone is lactose intolerant?</p> <p>lactase</p>	<p>What is the RNA with enzymic activities called?</p> <p>ribozyme</p>
<p>At which approximate temperature does the change in the enzymic activity become permanent?</p> <p>50 degrees Celsius</p>	<p>How many different kinds of amino acids have been found in nature?</p> <p>170</p>	<p>How many amino acids constitute proteins?</p> <p>20</p>
<p>How is the changeable part of an amino acid called?</p> <p>sidepart</p>	<p>With which reaction do amino acids connect?</p> <p>reaction of condensation (or condensation)</p>	<p>Which is the minimum number of amino acids in order for them to be called polypeptides?</p> <p>50</p>

<p>Which kind of bond is formed between two amino acids?</p> <p>covalent</p>	<p>How many organisation levels have all proteins got?</p> <p>3</p>	<p>What can destroy the three-dimensional structure of a protein?</p> <p>pH, T</p>
<p>How is the destruction of the three-dimensional structure of a protein called?</p> <p>denaturation</p>	<p>What determines the function of a protein?</p> <p>Its levels of organisation (or structure)</p>	<p>What kind of bonds get involved in the second organization level of a protein?</p> <p>hydrogenbonds</p>
<p>How many molecules of water come as a result of the join of two amino acids?</p> <p>1</p>	<p>What is the minimum number of the polypeptide chains of a protein so that it has a quaternary structure</p> <p>2</p>	<p>What are the structural parts of a protein?</p> <p>aminoacids</p>
<p>Which structure determines the molecule of a protein locally?</p> <p>The secondary.</p>	<p>Can a functional protein exist in a temperature of 40°C?</p> <p>No</p>	<p>Which kind of bond stabilizes the protein molecule locally?</p> <p>hydrogenbond</p>

<p>In which cellular organelle are the amino acids located?</p> <p>In the cytoplasm.</p>	<p>How many amino acids does insulin consist of?</p> <p>51</p>	<p>How is the molecule which consists of two amino acids called?</p> <p>dipeptide</p>
<p>Which are the monomers of the nucleic acids?</p> <p>nucleotides</p>	<p>Which nucleic acid do the deoxyribonucleotides have as a structural part?</p> <p>DNA</p>	<p>Which are the structural parts of RNA?</p> <p>ribonucleotides</p>
<p>With what kind of bonds do nucleotides connect?</p> <p>covalent bonds</p>	<p>How many carbons does the sugar of the nucleotide have?</p> <p>5</p>	<p>Except for the sugar and the n-bases, nucleotides also have a fluoride group. T or F?</p> <p>F</p>
<p>If pentose has –OH in the 2nd C, it is called ...</p> <p>ribose</p>	<p>The n-bases of DNA are adenine, cytosine, guanine and uracil. T or F?</p> <p>F</p>	<p>N-bases are paired. T or F?</p> <p>T</p>

<p>With what kind of bonds are n-bases connected?</p> <p>hydrogen bonds</p>	<p>Adenine and thymine are connected with double bonds while adenine and uracil are connected with triple bonds. T or F?</p> <p>F</p>	<p>Which pair of n-bases is connected with a triple bond?</p> <p>cytosine and guanine</p>
<p>DNA can be found in the nucleus, in mitochondria, lysosomes and chloroplasts. T or F?</p> <p>F</p>	<p>With what structures does RNA fold?</p> <p>hairpin structures</p>	<p>Which kind of RNA transfers the information from the nucleus to the ribosomes?</p> <p>m-RNA</p>
<p>t-RNA transfers amino-acids to mitochondria for the protein-synthesis. T or F?</p> <p>F</p>	<p>The s-RNA helps in the organization of DNA inside the nucleus. T or F?</p> <p>T</p>	<p>What is the analogy of the complementary n-bases in DNA?</p> <p>1/1</p>
<p>An important difference between DNA and RNA is that RNA is always monoclonal. T or F?</p> <p>F</p>	<p>RNA can also be found in the chloroplasts while DNA can also be found in the cytoplasm. T or F?</p> <p>F</p>	<p>Which is the longest part of the cell division?</p> <p>prophase</p>

<p>How many stages has the nucleus division got?</p> <p>4</p>	<p>Which is the role of fuselage?</p> <p>separation of sister chromatids</p>	<p>Another name for cytoplasm division.</p> <p>cytokinesis</p>
<p>In which stage of cell division do chromosomes have the maximum concentration degree?</p> <p>metaphase</p>	<p>How is the placement of similar chromosomes next to each other called?</p> <p>synapsis</p>	<p>How is it called when chromatids which belong to different chromosomes mix?</p> <p>genetic crossover</p>
<p>Which cells do meiosis?</p> <p>immature germ cells</p>	<p>In anaphase 1, are sister chromatids separated?</p> <p>No</p>	<p>Does meiosis 2 follow exactly the same progress as mitosis?</p> <p>Yes</p>
<p>Is the result of meiosis 1 the creation of two simple cells with doubled chromosomes?</p> <p>Yes</p>	<p>Which is the use of genetic crossover?</p> <p>The creation of a variety of organisms.</p>	<p>After the end of meiosis, how many cells have been created?</p> <p>4</p>

<p>Where does the alignment of chromosomes, in meiosis 1, take place?</p> <p>In equator.</p>	<p>In which stage of meiosis 1 are the nuclei formed?</p> <p>In telophase 1.</p>	<p>Where does DNA duplication take place?</p> <p>In the cell nucleus.</p>
<p>Which enzyme takes part in the DNA transcription?</p> <p>RNA polymerase</p>	<p>Where does the final protein modification take place?</p> <p>In the Golgi Complex.</p>	<p>In which way does the DNA duplicate itself?</p> <p>Semi-conservative</p>
<p>How is a triad of nucleotides called?</p> <p>codicone</p>	<p>How many nucleotide triplets are there in the genetic code?</p> <p>64</p>	<p>Which is the first amino acid to be translated?</p> <p>methionine</p>
<p>Which characteristic of the genetic code proves that all species evolved from a common ancestor?</p> <p>universal</p>	<p>How is the part of DNA that can be transcribed called?</p> <p>gene</p>	<p>Which is the second stage of translation?</p> <p>extension</p>

<p>What is the bond between methionine and the second amino acid called?</p> <p>peptide</p>	<p>What is the area where information-specific genes are located called?</p> <p>genetic field</p>	<p>Who discovered the DNA form?</p> <p>Rosalind Franklin</p>
<p>How is it called the genetic code characteristic with which an amino acid can be coded from one or more codicones?</p> <p>degenerate</p>	<p>In which bacterium was research on DNA auto-duplication firstly conducted?</p> <p>E. Coli</p>	<p>Energy molecule that takes part in proteinosynthesis.</p> <p>ATP</p>
<p>What is formed in the micro tubes of an animal cell?</p> <p>centrosome</p>	<p>What constitutes the cell structure?</p> <p>fibril complex</p>	<p>What surrounds the nucleus?</p> <p>nuclear envelope</p>
<p>What is the shape of the nucleus?</p> <p>round/avoid</p>	<p>In what kind of cells are lysosomes found?</p> <p>plant cells</p>	<p>If the enzymes of the lysosomes were floating free in the cytoplasm, then they would gradually destroy the whole cell. True or false?</p> <p>True</p>

<p>Which is the main component of the cellular wall in plants?</p> <p>cellulose</p>	<p>Are all cells surrounded by a cellular wall?</p> <p>No</p>	<p>Except for the plant, fungi and bacteria cells, whose other group of organisms are cells surrounded by a cellular wall?</p> <p>algae</p>
<p>To which wide category do chloroplasts belong?</p> <p>plastids</p>	<p>How are flattened cystoids called?</p> <p>thylakoids</p>	

ΕΠΙΤΡΑΠΕΖΙΟ ΠΑΙΧΝΙΔΙ ΓΝΩΣΕΩΝ ΒΙΟΛΟΓΙΑΣ “Avoid them”

Ακολουθούν οι κανόνες του παιχνιδιού, το λογότυπό του και οι κάρτες με τις λέξεις προς περιγραφή και τις απαγορευμένες λέξεις από κάτω. Εκτός από αυτό το υλικό, χρειάζεται και μία κλεψύδρα για να παιχτεί το συγκεκριμένο παιχνίδι.

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Light blue: Cellular Organelles

Yellow: Mitosis – Meiosis

Orange: Molecular Genetics

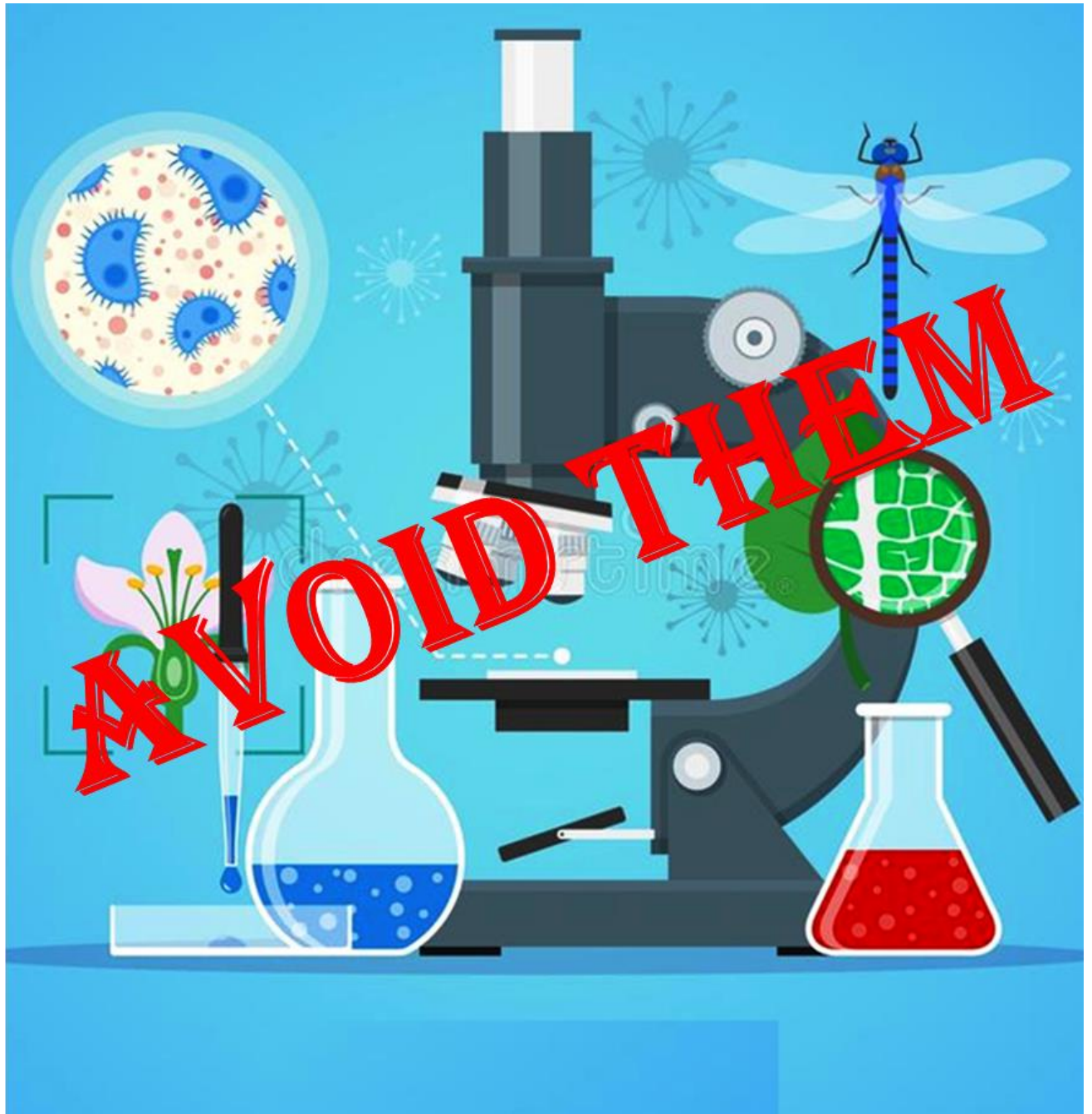
Light Green: Proteins

Light purple: Enzymes

Light grey: Carbohydrates & Lipids

The game is played in the following way:

1. We mix all the cards well.
2. The players are divided into teams of 5.
3. One of the teams is selected by chance to start describing biology terms.
4. The player of the team that starts the game stands up, picks a card by chance and tries to describe to the other players of his/her team the term on the top of the card without using any of the words that follow, their derivatives or the described term's derivatives. The player tries to describe as many terms as possible, as long as the sand glass moves. The players of his/her team try to guess and name the described term as quickly as possible. While the player is describing, a player from another team checks that he/she does not use the forbidden words and also checks the sand glass.
5. The cards whose terms are successfully named are kept by the player's team. If any forbidden words are used during the description, the card is left out. Moreover, the player has the right to leave a card out if he/she finds the term to be described too difficult.
6. When the time is over, a player of the following team continues by describing other terms to his/her team. The turn of the teams moves clockwise.
7. After 5 rounds, the teams count the cards whose terms they have named correctly.
8. The team with the biggest number of cards is the winner.



<p>Amino acids</p> <p>structural parts 20</p>	<p>Peptide</p> <p>compound amino group carboxyl group</p>	<p>Peptide bond</p> <p>covalent bond condensation hydrolysis</p>
<p>A' helix</p> <p>secondary structure level</p>	<p>Side chain</p> <p>carbon R bond</p>	<p>Denaturation</p> <p>temperature pH hydrogen bonds</p>
<p>Hemoglobin</p> <p>iron blood oxygen</p>	<p>Collagen</p> <p>bone skin structural protein</p>	<p>Hydrogen bond</p> <p>secondary structure tertiary structure covalent bond</p>
<p>Carboxyl group</p> <p>carbon oxygen hydrogen</p>	<p>Amino group</p> <p>nitrogen hydrogen carboxyl group</p>	<p>Primary structure</p> <p>secondary structure tertiary structure amino acid</p>
<p>Structural proteins</p> <p>elastin collagen tertiary structure</p>	<p>Functional proteins</p> <p>transportational proteins defensive proteins contractile proteins</p>	<p>Prophase</p> <p>nucleus spindle apparatus meiosis mitosis chromatin</p>

<p>Metaphase meiosis mitosis compression equator microscope</p>	<p>Anaphase meiosis mitosis pole division centrosome</p>	<p>Telophase meiosis mitosis nucleus prophase last</p>
<p>Sister Chromatids copies chromosome centromere identical DNA replication</p>	<p>Cell division reproduction DNA replication gametes cell cycle zygote</p>	<p>Chromosome chromatin cell DNA sister chromatids centromere</p>
<p>Homologous chromosomes gene loci genetic variation same synapsis</p>	<p>Synapsis syndesis chiasmata genetic recombination genetic variability chromosomal crossover</p>	<p>Chiasmata exchange genetic material chromosomal crossover genetic variability genetic recombination</p>
<p>Spindle apparatus centrosomes fibers cell membrane poles plant cells</p>	<p>Centrosome body center plants spindle apparatus centriole</p>	<p>Chromosomal crossover homologous chromosomes genetic recombination genetic variability genes different</p>

<p>Diploid cells haploid cells mother father gametes organisms</p>	<p>Catalysts speed reaction compound accelerate</p>	<p>Enzymes catalysts organic energy substrate center</p>
<p>Activation energy initial exothermic reaction complex fulfillment</p>	<p>Irreversible inhibitor action permanent connection functionality indirect</p>	<p>Reversible inhibitor action permanent connection functionality indirect</p>
<p>Cofactors functionality protein ions trace elements organic</p>	<p>Exothermic reaction product reactant energy activation heat</p>	<p>Substrate protein reactant enzyme active center product</p>
<p>Pepsin enzyme stomach intracellular action cavity</p>	<p>Coenzymes vitamin organic formation connection cofactor</p>	<p>Protein synthesis mRNA proteins amino acid translation ribosome</p>

<p>Methionine</p> <p>beginning tRNA ribosome cytoplasm codon</p>	<p>Chromosome</p> <p>DNA membrane offspring histones centromere</p>	<p>Complementarity</p> <p>bases nucleus DNA adenine cytosine</p>
<p>Elongation</p> <p>tRNA anticodon ribosome repeat chain</p>	<p>Genetic code</p> <p>codon amino acids tRNA bases proteins</p>	<p>Codon</p> <p>bases nucleotide genetic information beginning</p>
<p>Synonymous</p> <p>codons same amino acids genetic code</p>	<p>Self-duplication</p> <p>DNA two RNA complementarity bases</p>	<p>Semi-conservative</p> <p>DNA self-duplication reproduction chains structure</p>
<p>Degenerate</p> <p>synonymous amino acids DNA codon proteins</p>	<p>Diploid</p> <p>haploid cells organism double two</p>	<p>Homologs</p> <p>chromosomes same information bases structure</p>
<p>Carbohydrates</p> <p>macromolecules energy monomers</p>	<p>Disaccharide</p> <p>atoms maltose carbon</p>	<p>Lactose</p> <p>milk glucose maltose</p>

<p>Cellulose</p> <p>structural cellular wall</p>	<p>Starch</p> <p>vegetal energy polysaccharide</p>	<p>Double layer</p> <p>plasmatic membrane hydrophobic tails</p>
<p>Triglyceride</p> <p>neutral saturated glycerol</p>	<p>Steroids</p> <p>body gym muscles</p>	<p>Cholesterol</p> <p>HDL arteries liver</p>
<p>Esterification</p> <p>reaction alcohol acid</p>	<p>Glucose</p> <p>spirals branches storing molecule</p>	<p>Hydrophobic molecules</p> <p>fatty acids hydrophilic water</p>
<p>LDL</p> <p>cholesterol arteries blocking</p>	<p>Energy</p> <p>lipids food organism</p>	<p>Lipids</p> <p>energy macromolecule fat</p>
<p>DNA</p> <p>helix double-stranded deoxyribose thymine RNA</p>	<p>Pentose</p> <p>bond covalent carbohydrate sugar</p>	<p>Double helix</p> <p>DNA Watson Crick</p>

<p>RNA DNA uracil bacteria monoclonal protein</p>	<p>Bond covalent hydrogen base chain</p>	<p>r-RNA ribosomic structure protein core</p>
<p>t-RNA transfer material amino acid protein nucleus</p>	<p>m-RNA messenger protein information composition ribosome</p>	<p>s-RNA DNA core organisation mitochondria chloroplast</p>
<p>Nitrogen base adenine guanine cytosine thymine uracil</p>	<p>Sugar deoxyribose ribose base-N phosphoric-group guanine</p>	<p>Hydrogen bond stabilization helix N-base</p>
<p>Phosphate group pentose ribose deoxyribose nitrogen oxygen</p>	<p>Nucleotide DNA RNA structure acid</p>	<p>Mitochondria powerhouse cell energy muscle</p>
<p>Chloroplasts photosynthesis grana green sun plants</p>	<p>Nucleus DNA core RNA eukaryotes prokaryotes</p>	<p>Ribosomes RNA proteins translation amino acids macro-molecules</p>

<p>Lysosome</p> <p>destruction acidic macro-molecules small</p>	<p>Matrix</p> <p>mitochondria inner membrane neo energy</p>	<p>Centrosome</p> <p>meiosis mitosis plants centrioles spindle</p>
<p>Double helix</p> <p>RNA Watson Crick Franklin structure</p>	<p>Vacuole</p> <p>plants water storage green enzyme</p>	<p>Nucleolus</p> <p>nucleus RNA DNA proteins eukaryotes</p>
<p>Golgi apparatus</p> <p>eukaryotes proteins endomembranes enzymes</p>	<p>Endoplasmatic reticulum</p> <p>ribosomes endomembranes smooth rough</p>	<p>Cytosol</p> <p>inside water solution matrix cytoplasm</p>
<p>Cytoplasm</p> <p>cytosol organelles cell entirety water</p>	<p>Cell membrane</p> <p>lipids proteins mosaic cytoplasmic protection</p>	

ΕΠΙΤΡΑΠΕΖΙΟ ΠΑΙΧΝΙΔΙ ΓΝΩΣΕΩΝ ΒΙΟΛΟΓΙΑΣ

“Name it!”

Ακολουθούν οι κανόνες του παιχνιδιού, το λογότυπό του και οι κάρτες με τις εικόνες.

Σημείωση: Οι κάρτες μπορούν να είναι διπλής όψευς, από τη μία μεριά οι εικόνες και από την άλλη το λογότυπο του παιχνιδιού, καθώς και να πλαστικοποιηθούν. Όλες οι κάρτες μπορούν να φυλάσσονται σε ένα κουτί με τους εκτυπωμένους κανόνες και το λογότυπο του παιχνιδιού έξω από το κουτί, για να είναι ένα ολοκληρωμένο επιτραπέζιο παιχνίδι.

“Name it!” Rules

The game is played in the following way:

1. The game is played with 3 players and a moderator player.
2. We mix all the cards well.
3. Each player takes one card.
4. The rest of the cards are put in a heap on the table.
5. The moderator player reveals the first card and the player who detects and names the common image between his/her card and the revealed card takes it. The game continues in the same way. The players have to detect the common image between the last card they have taken and the revealed card on the table.
6. When the cards finish, the game finishes, too.
7. Winner is the player who collects the biggest number of cards.



