MARCO LEARNING®

Welcome to AP® Jumpstart!

AP Biology

Topic Breakdown

Units	Exam Weighting	#Qs
Unit 1: Chemistry of Life	8 – 11 % (5 – 7)	5.7
Unit 2: Cell Structure and Function	10 – 13% (6 – 8)	6.7
Unit 3: Cellular Energetics	12 – 18% (7 – 10)	9.3
Unit 4: Cell Communication and Cell Cycle	10 – 15% (6 – 9)	6.7

Topic Breakdown

Units	Exam Weighting	#Qs
Unit 5: Heredity	8 – 11% (5 – 7)	6
Unit 6: Gene Expression and Regulation	12 – 16% (7 – 10)	8
Unit 7: Natural Selection	13 – 20% (8 – 12)	9.3
Unit 8 Ecology	10 – 15% (6 – 9)	8.3

Unit 1: Chemistry of Life

Water Properties & Biochemistry

- Hydrogen Bonds
- Proteins
- Lipids
- Nucleic Acids
- Carbohydrates

This is the foundational knowledge that we will build upon for all of AP Biology.

Unit 2: Cell Structure & Function

Topics: Organelles & Membrane Transport

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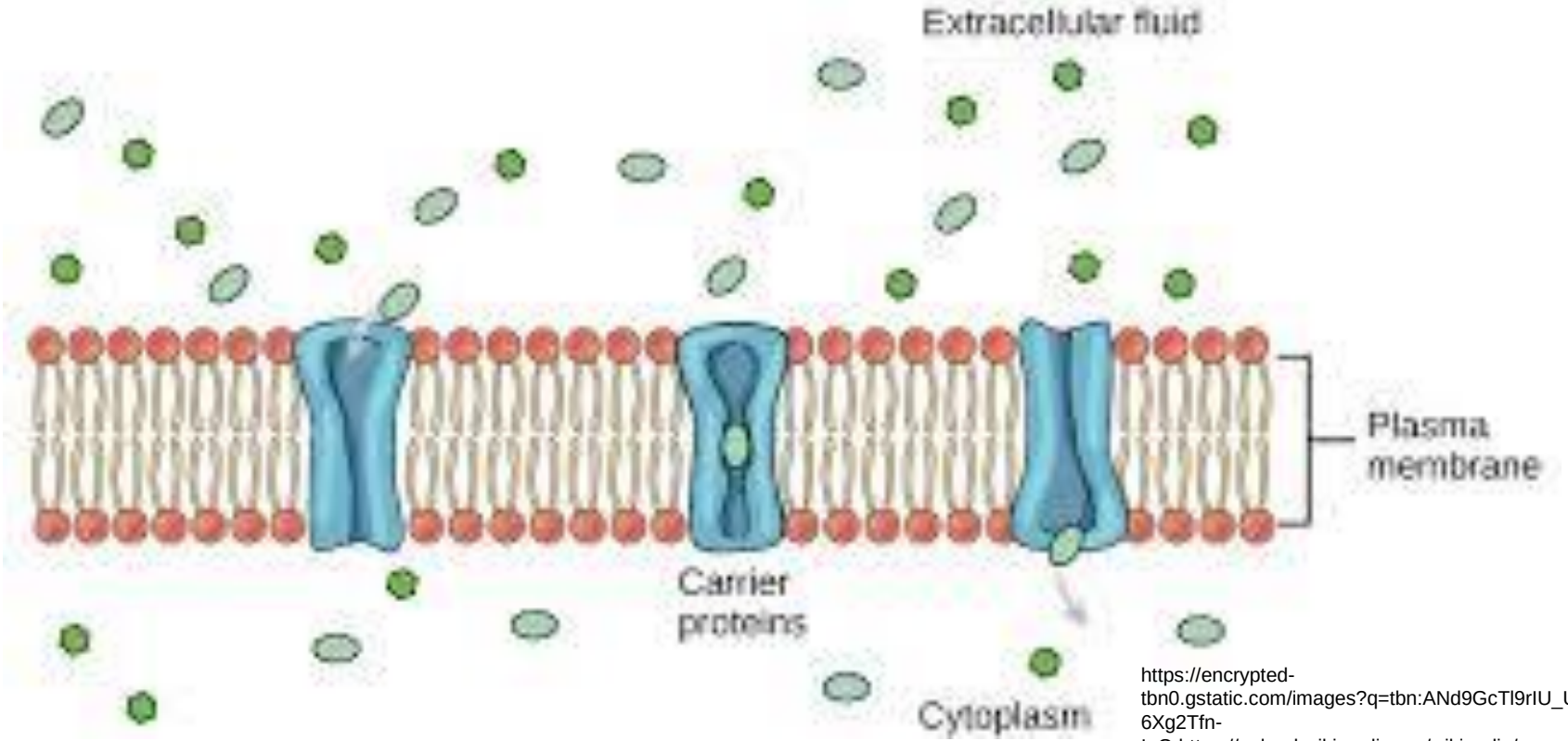
Unit 2: Cell Structure & Function

Organelles & Membrane Transport



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Unit 3: Cellular Energetics

Enzymes & Energy

- Proteins
- Cellular Respiration
- Photosynthesis

Don't get stuck on the minor details...

What goes in?
What comes out?
Where?
Why is it important?

Unit 4: Cell Comm. & Cell Cycle

Signal Transduction & Mitosis

- Receptor, Transduction, Response
- Checkpoints
- Interphase
- Mitosis
- Cytokinesis

Unit 5: Heredity

Meiosis & Genetics

- Meiosis
- Comparison w/ Mitosis
- Mendelian Genetics
- Non-Mendelian Genetics

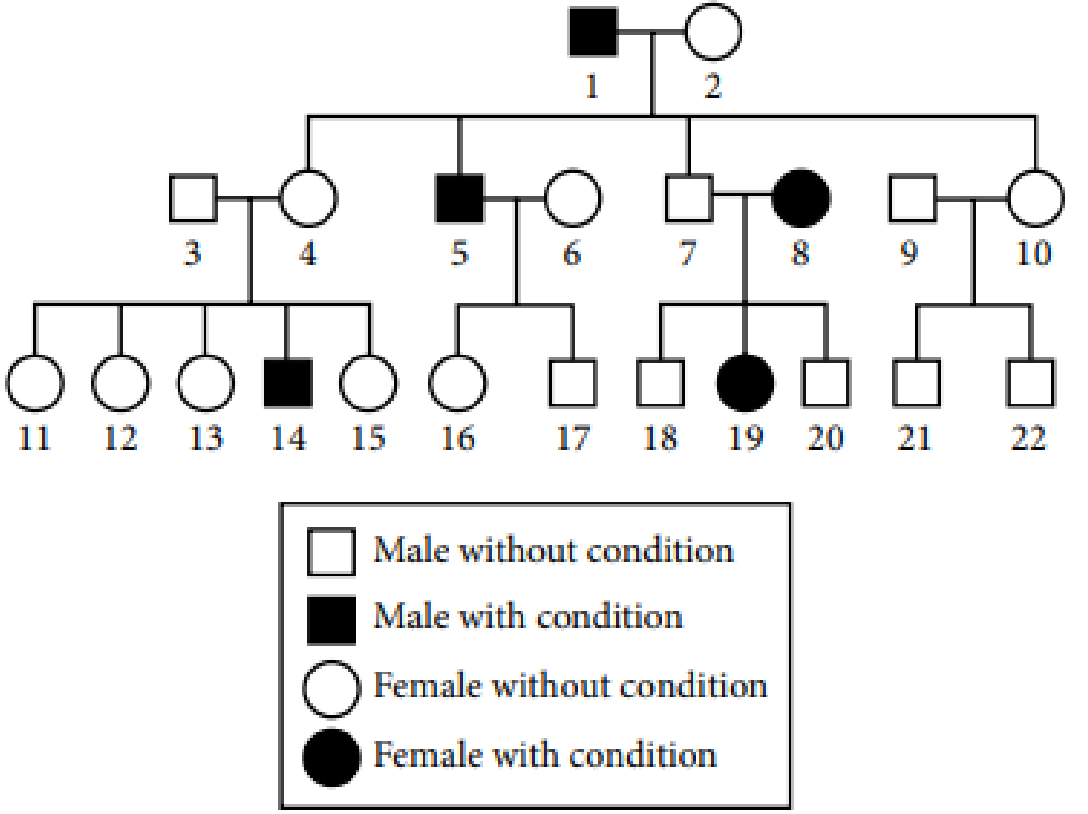


Figure 1. Inheritance of a particular condition over three generations of a family

Unit 6: Gene Express & Regulation

Molecular Genetics

- DNA vs. RNA
- Replication
- Transcription
- Translation
- Mutations
- BioTechnology

It's all about that central DOG-ma, right?

Unit 7: Natural Selection

Evolution

- Selection
- Hardy-Weinberg
- Phylogeny
- Evidence of Evolution

Unit 8: Ecology

- Energy Flow
- Population Ecology
- Community Ecology

Practice Multiple Choice

Insulin is a protein hormone that is secreted in response to elevated blood glucose levels. When insulin binds to its receptors on liver cells, the activated receptors stimulate phosphorylation cascades that cause the translocation of glucose transporters to the plasma membrane.

Practice Multiple Choice

Based on the information provided, which of the following best describes the role of insulin in this liver cell signal transduction pathway?

(A) It acts as a ligand.
(B) It acts as a receptor.
(C) It acts as a secondary messenger.
(D) It acts as a protein kinase.

Humans have a diploid number (“2n”) of 46. Which of the following statements best predicts the consequence if meiosis did not occur during gametogenesis?

(A) The gametes would get larger from one generation to the next.

(B) The chromosome number would double with each generation.

(C) The chromosome number would be halved with each generation.

(D) The chromosome number would triple with each generation

Which of the following best explains the feedback mechanism illustrated in Figure 1?
(A) This is an example of positive feedback, because the few platelets that initially bind attract more platelets to the damaged area.
(B) This is an example of positive feedback, because it results from the interactions among collagen, endothelial cells, and platelets.
(C) This is an example of negative feedback, because a large clump of platelets can block the blood vessel and prevent blood flow through it.
(D) This is an example of negative feedback, because the accumulation of platelets returns the open blood vessel wall to a closed state.

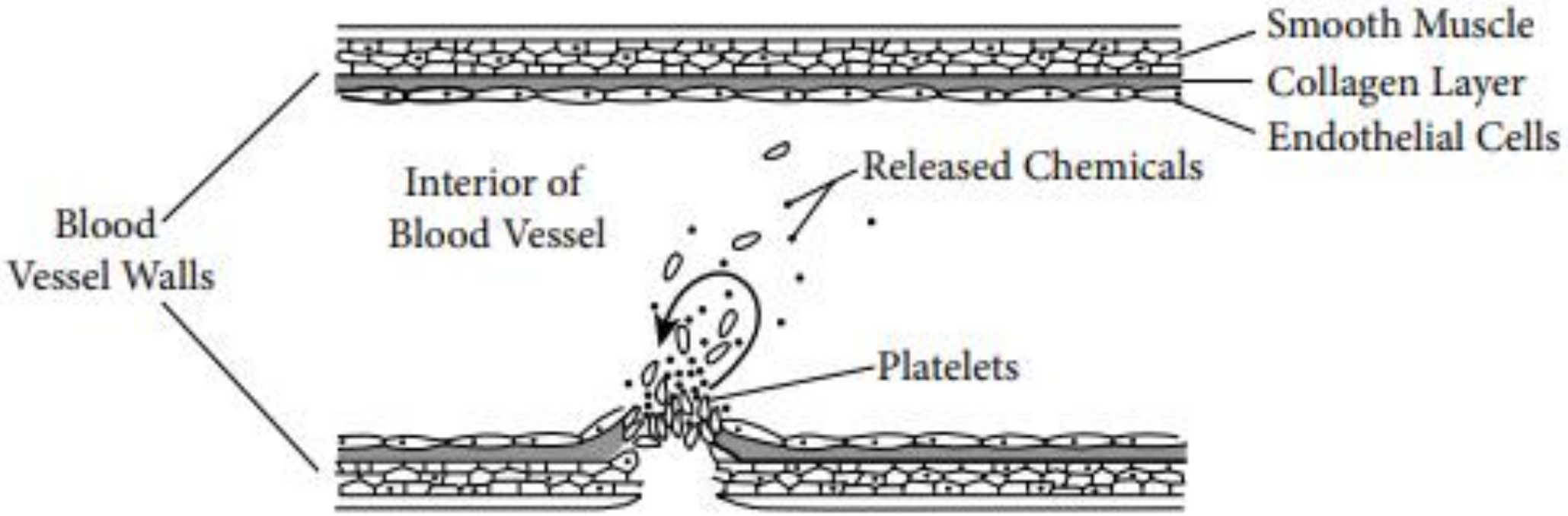


Figure 1. Formation of a platelet plug in a damaged blood vessel wall

Which of the following best explains the feedback mechanism illustrated in Figure 1?

(A) This is an example of positive feedback, because the few platelets that initially bind attract more platelets to the damaged area.

(B) This is an example of positive feedback, because it results from the interactions among collagen, endothelial cells, and platelets.

(C) This is an example of negative feedback, because a large clump of platelets can block the blood vessel and prevent blood flow through it.

(D) This is an example of negative feedback, because the accumulation of platelets returns the open blood vessel wall to a closed state.

Practice Free Response (#5)

In humans, the gene that determines a particular condition has only two alleles, one of which (B) is completely dominant to the other (b). The phenotypes of three generations of a family with respect to the condition are shown in the pedigree in Figure 1. Individuals are numbered.

Practice Free Response (#5)

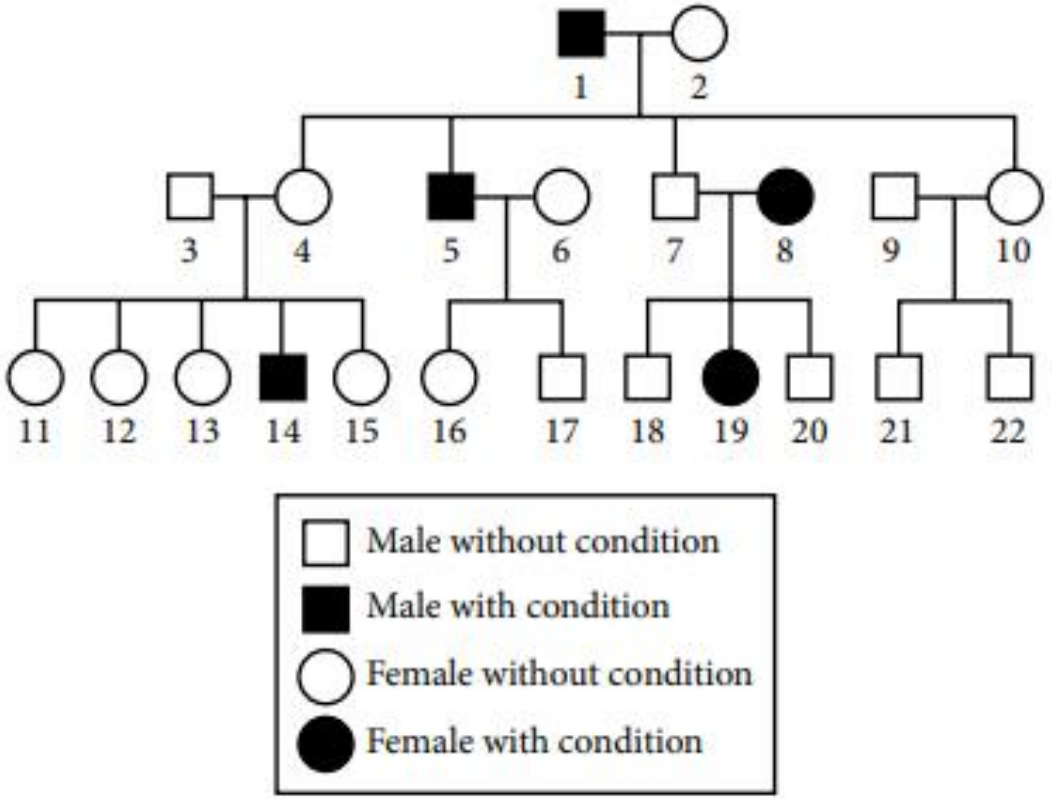


Figure 1. Inheritance of a particular condition over three generations of a family

Practice Free Response (#5)

(a) **Describe** the process in eukaryotes that ensures that the number of chromosomes will not double from parent to offspring when gametes fuse during fertilization.

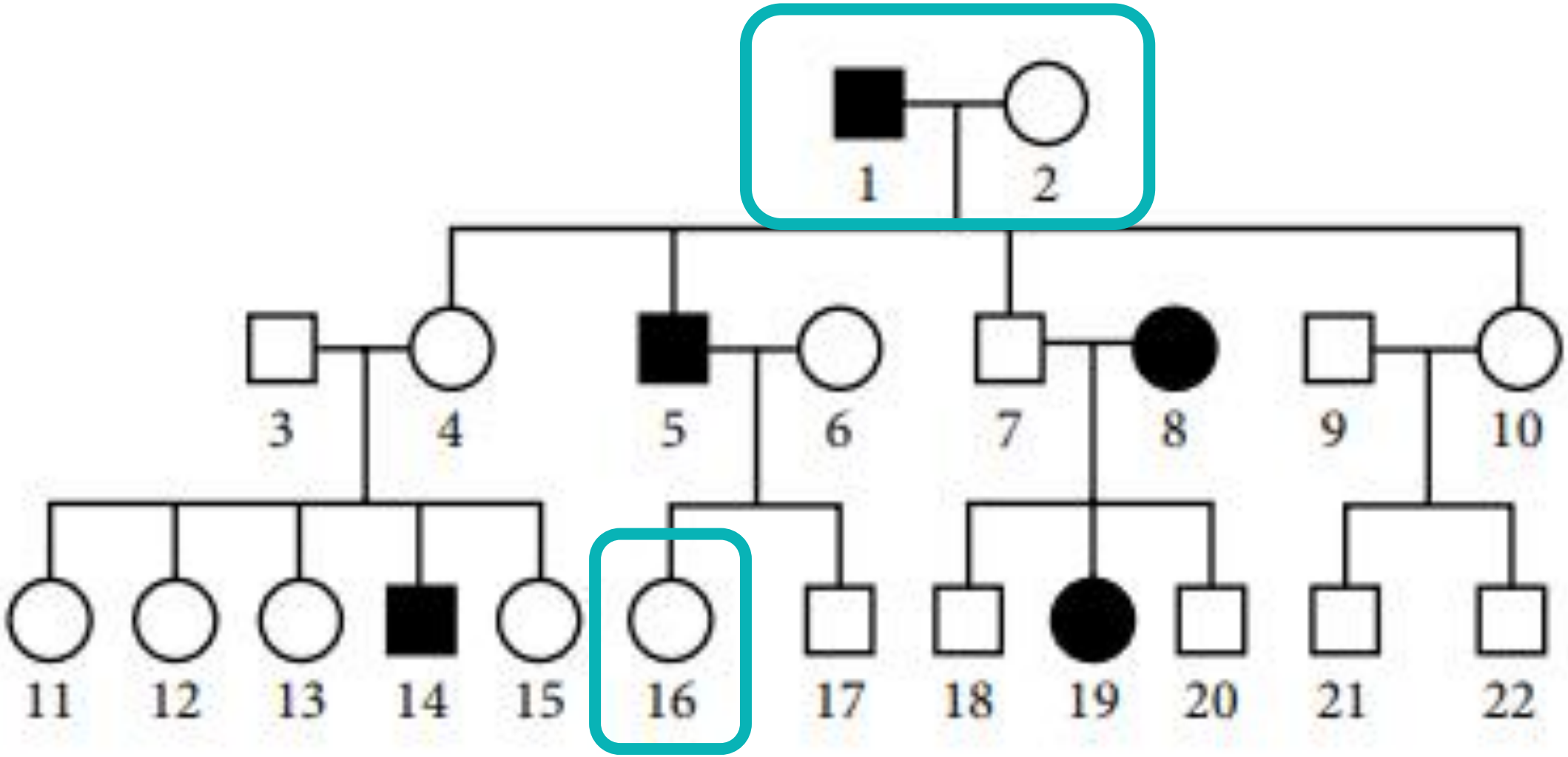
Practice Free Response (#5)

Homologous pairs of chromosomes separate in meiosis I, so the gametes are haploid (n), and each gamete receives only one member of each chromosome pair

Practice Free Response (#5)

(b) **Explain** how any one chromosome in individual 16 contains DNA that came from <u>both</u> individuals 1 and 2.

Practice Free Response (#5)



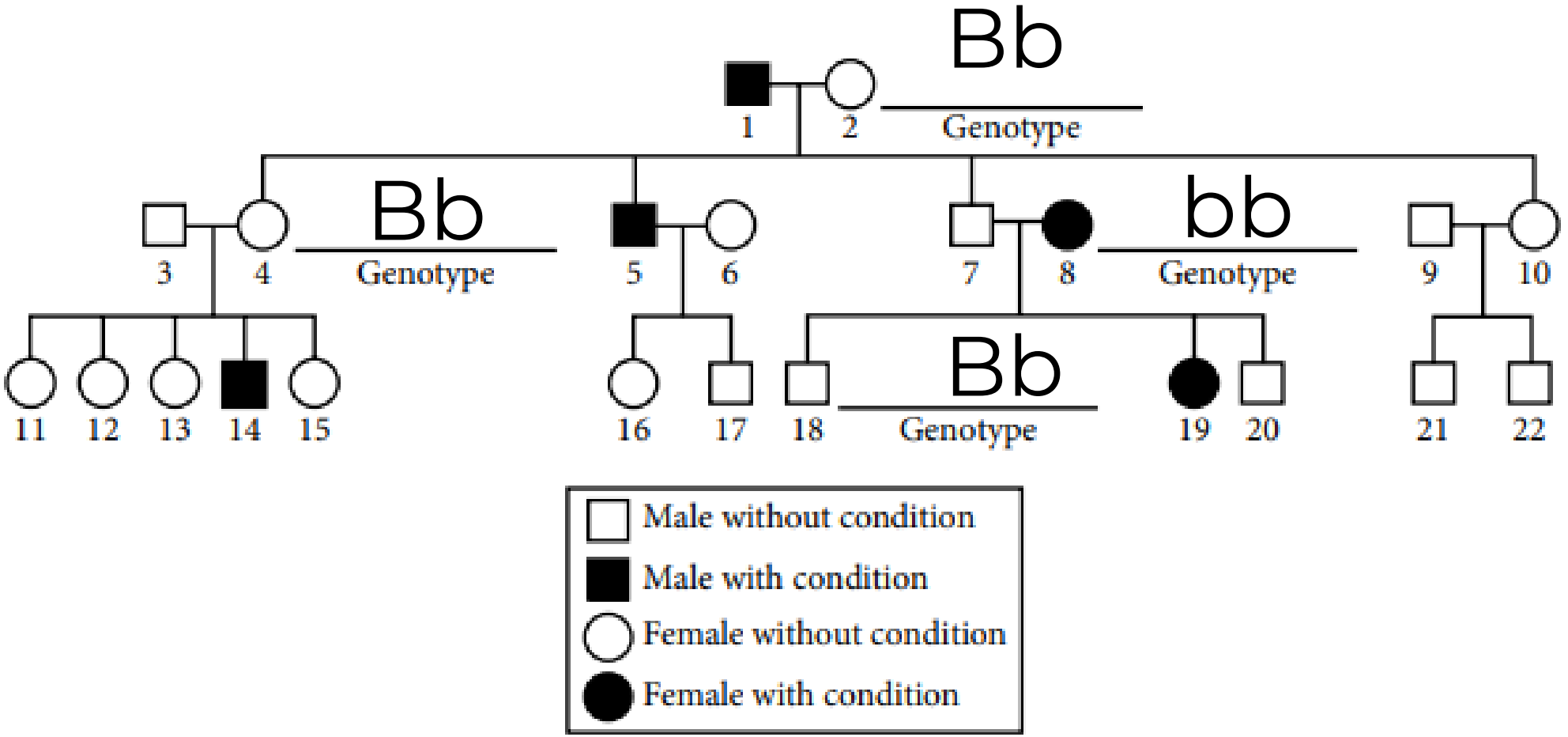
Practice Free Response (#5)

Individual 5 inherited one member of each homologous pair of chromosomes from individuals 1 and 2. During gamete formation in individual 5, crossing over occurred between non-sister chromatids in each homologous pair. Thus each chromosome formed and passed on to individual 16 contains DNA from both 1 and 2.

Practice Free Response (#5)

(c) **Use the template** figure of the pedigree and the allele designations *B* and *b* to **indicate** the genotypes of individuals 2, 4, 8, and 18.

Practice Free Response (#5)



Practice Free Response (#5)

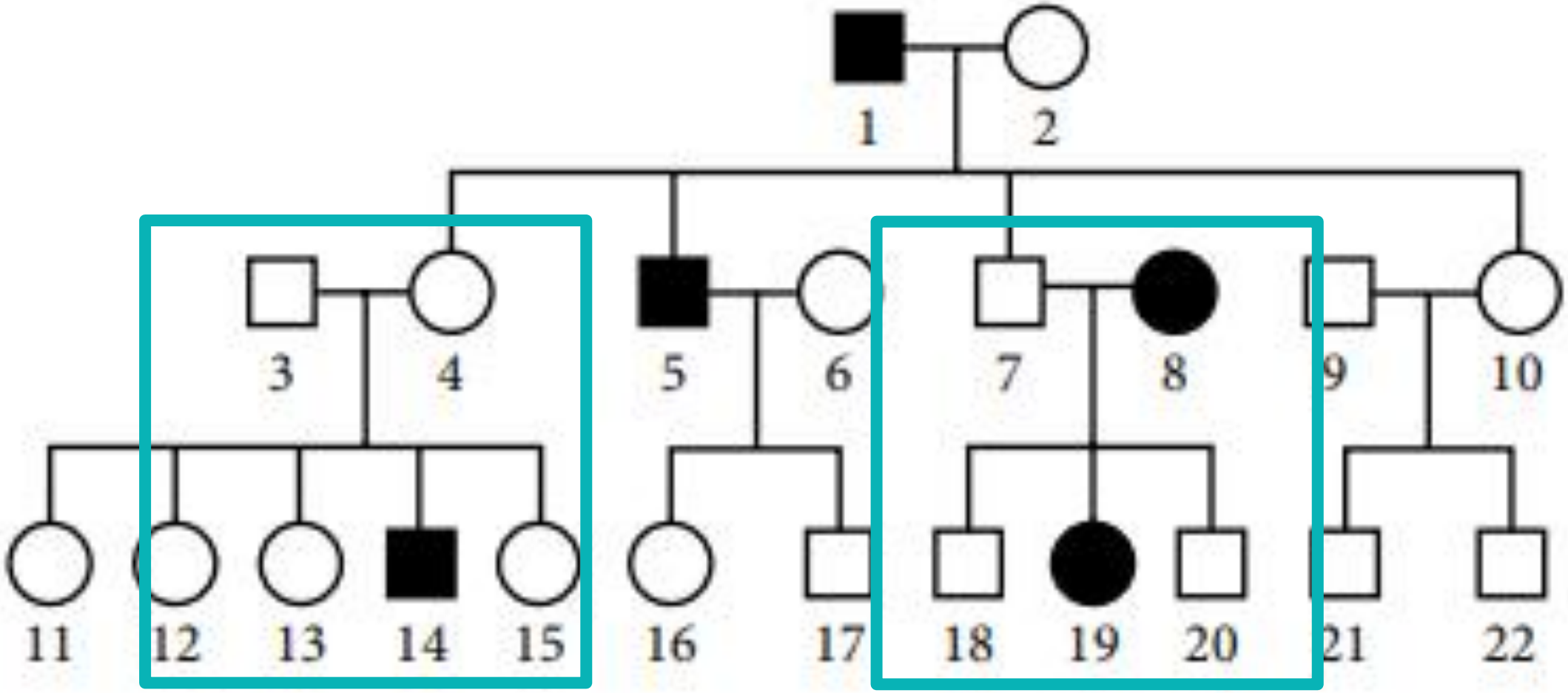
Individual 2, 4, and 18: The genotype of all three is Bb.

Individual 8: The genotype is bb.

Practice Free Response (#5)

(d) Based on the pedigree, **explain** whether the inheritance pattern of the condition is sex-linked or autosomal and dominant or recessive.

Practice Free Response (#5)



Practice Free Response (#5)

The disease phenotype is recessive and is autosomal/not sex-linked. It cannot be dominant because individuals 3 and 4 do not have it, but their offspring 14 does. It is not sex-linked because if it was Y-linked, all male offspring of males with the disease phenotype would have the trait, and they do not.

How to Prepare for the AP Exam

Review Content

- Pace yourself
- Read and take notes with an AP Review Book
- AP Biology Review Guide

Resources

- Podcast: @theapsoluterecap
- YouTube: Bozeman Biology
- Review Book: Barron's (7th Edition)

Check out the AP Biology Review Guide...

apbiopenguins.weebly.com

Instagram Review starts 2/1

MARCO LEARNING®

AP Student Support

with feedback

Practice makes perfect.

@apbiopenguins for daily review in the Instagram Stories starting Feb 1 & Live Sessions twice a month

Quick Quizizz Games for Quick Checks

Practice Multiple Choice & Free Responses in the AP Biology Review Guide

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