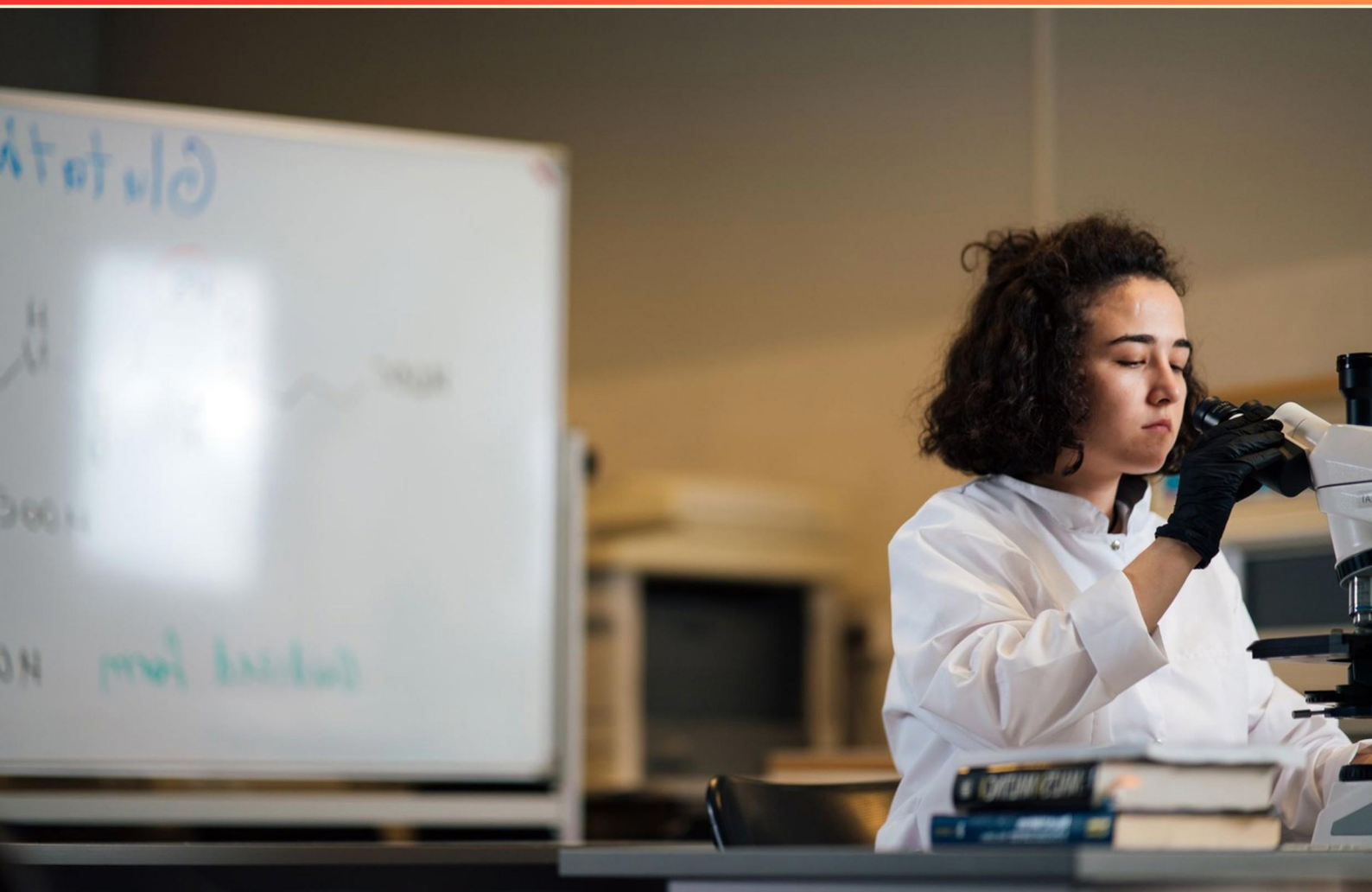


MFM MOLECULAR TEST 3 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

<https://mfmmolecular3.examzify.com>



Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	15

SAMPLE

Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

SAMPLE

- 1. What role does fibronectin play in embryogenesis?**
 - A. Regulates cell migration.
 - B. Regulates apoptosis.
 - C. Guides neural crest differentiation.
 - D. Stores calcium.

- 2. Which structure anchors basal keratinocytes to the basement membrane?**
 - A. Adherens junctions
 - B. Desmosomes
 - C. Tight junctions
 - D. Hemidesmosomes

- 3. Type III collagen is mainly found in which tissue?**
 - A. Dentin
 - B. Arteries
 - C. Skin
 - D. Liver

- 4. In next-generation sequencing, what do depth of coverage and breadth of coverage mean, and why are they important for diagnostic accuracy?**
 - A. Depth of coverage is the number of reads per base; breadth is the proportion of target bases covered at a minimum depth. Both determine confidence in variant calls.
 - B. Depth is the number of reads per base and breadth is read length.
 - C. Depth is the number of samples sequenced; breadth is the number of genes.
 - D. Depth is the error rate and breadth is GC content.

- 5. Fibronectin binds to**
 - A. Integrins and laminin
 - B. Collagen and integrins
 - C. Hyaluronic acid and proteoglycans
 - D. Actin and myosin

- 6. Which statement about de novo variants in prenatal testing is most accurate?**
- A. They are present in the fetus but not in either parent
 - B. They are inherited from a parent
 - C. They are common in the population
 - D. They are irrelevant to recurrence risk
- 7. Which caveat should accompany SNV zygosity interpretation in prenatal testing?**
- A. Allelic dropout
 - B. Copy number variation
 - C. Phasing limitations
 - D. Paternity status
- 8. Which amino acid is the first in every collagen triplet?**
- A. Glycine
 - B. Proline
 - C. Hydroxyproline
 - D. Serine
- 9. What is the main function of tight junctions?**
- A. Direct communication between adjacent cells.
 - B. Attach cells to the basal lamina.
 - C. Allow paracellular transport of ions and molecules.
 - D. Seal adjacent epithelial cells and form a barrier.
- 10. Cadherins typically mediate what type of binding between cells?**
- A. Covalent bonding
 - B. Ionic binding
 - C. Homophilic binding
 - D. Heterophilic binding

Answers

SAMPLE

1. A
2. D
3. B
4. A
5. B
6. B
7. C
8. A
9. D
10. C

SAMPLE

Explanations

SAMPLE

1. What role does fibronectin play in embryogenesis?

- A. Regulates cell migration.**
- B. Regulates apoptosis.
- C. Guides neural crest differentiation.
- D. Stores calcium.

Fibronectin serves as a key extracellular matrix scaffold in the developing embryo, providing adhesive tracks that guide cell movement. It binds to cell surface receptors (like integrins) and to other ECM components, creating a substrate cells grip as they migrate. This adhesive environment, along with the signaling cues fibronectin delivers, helps orchestrate essential movements during development, such as the migrations seen in gastrulation and other shaping events. Because of this direct role in enabling and guiding cellular motion, fibronectin is best described as regulating cell migration. It doesn't store calcium, and while its presence can influence survival or differentiation indirectly, those are not its primary embryogenic function.

2. Which structure anchors basal keratinocytes to the basement membrane?

- A. Adherens junctions
- B. Desmosomes
- C. Tight junctions
- D. Hemidesmosomes**

Hemidesmosomes are the structures that anchor the basal layer of keratinocytes to the basement membrane. They function like half-desmosomes, connecting the cell's internal keratin intermediate filament network to the extracellular basement membrane through integrin receptors (notably the alpha6beta4 integrin) and associated proteins, with components such as BP180 (collagen XVII) helping to secure the connection to laminin in the basement membrane. This setup provides a strong, stable interface that keeps epithelial cells attached to the underlying matrix. Other junctions serve different purposes. Adherens junctions and desmosomes mainly connect cells to neighboring cells—adherens junctions link to the actin cytoskeleton via E-cadherin, while desmosomes connect keratin filaments between adjacent cells through desmogleins/desmocollins. Tight junctions seal the space between cells. Hemidesmosomes, by contrast, anchor cells to the basement membrane, which is essential for tissue integrity and resistance to mechanical stress.

3. Type III collagen is mainly found in which tissue?

- A. Dentin
- B. Arteries**
- C. Skin
- D. Liver

Type III collagen forms delicate reticular fibers that create a flexible scaffold in tissues that need a soft, supportive mesh. This kind of network is especially important in vessel walls, where it helps the arterial wall stretch and recoil with each heartbeat while maintaining integrity. That makes arteries the tissue where Type III collagen is most characteristic. By contrast, dentin and skin are predominantly rich in Type I collagen, which provides strong tensile strength, and the liver contains a mix but is not defined by Type III in the same way as arteries.

4. In next-generation sequencing, what do depth of coverage and breadth of coverage mean, and why are they important for diagnostic accuracy?

- A. Depth of coverage is the number of reads per base; breadth is the proportion of target bases covered at a minimum depth. Both determine confidence in variant calls.**
- B. Depth is the number of reads per base and breadth is read length.
- C. Depth is the number of samples sequenced; breadth is the number of genes.
- D. Depth is the error rate and breadth is GC content.

The key idea is how thoroughly a sequencing run covers the target region. Depth of coverage means, on average, how many times each base is read. The more reads that cover a base, the more confident you can be that a called variant is real and not a random sequencing error, and the better you can determine zygosity (heterozygous vs homozygous). Breadth of coverage is about how much of the target region actually gets sequenced at or above a chosen minimum depth—it's the proportion of bases that meet that threshold. Together, these metrics shape diagnostic trust: high depth reduces false positives and helps detect true variants, while wide breadth ensures you're not missing variants simply because parts of the target weren't sequenced at all. In practice, labs pick minimum depth thresholds (for example, a certain number of reads) and aim for a high percentage of the target to meet that depth, because both insufficient depth and incomplete breadth can lead to missed or misinterpreted findings.

5. Fibronectin binds to

- A. Integrins and laminin
- B. Collagen and integrins**
- C. Hyaluronic acid and proteoglycans
- D. Actin and myosin

Fibronectin serves as a bridge between cells and the extracellular matrix. It has distinct binding sites that let it connect to both cell surfaces and matrix proteins. One key region binds integrins on the cell membrane, enabling cells to grip the matrix and send signals about their environment. Another region binds collagen, helping to organize and stabilize the collagen network in the matrix. This combination—collagen and integrins—allows fibronectin to anchor cells to the ECM and facilitate matrix assembly and communication. The other options don't describe fibronectin's main direct partners: actin and myosin are intracellular cytoskeletal proteins, and while fibronectin can interact with other components in the broader matrix, the classic, primary binding partners are collagen and integrins.

6. Which statement about de novo variants in prenatal testing is most accurate?

- A. They are present in the fetus but not in either parent
- B. They are inherited from a parent**
- C. They are common in the population
- D. They are irrelevant to recurrence risk

De novo variants are new genetic changes that arise in the fetus and are not present in either parent. In prenatal sequencing, finding a variant in the fetus that is absent from both parents indicates a de novo event, meaning it occurred spontaneously in the germ line or early embryo. This is why the statement that the variant is present in the fetus but not in either parent is the most accurate. Since de novo variants are not inherited, they do not come from a parent's genome; however, recurrence risk for future pregnancies is not zero—there can be a small risk due to parental gonadal mosaicism. The other ideas don't fit: if a variant were inherited, it wouldn't be de novo; de novo variants are typically rare, not common in the population; and they are relevant to recurrence risk because, while usually low, there is a potential risk in subsequent pregnancies.

7. Which caveat should accompany SNV zygosity interpretation in prenatal testing?

- A. Allelic dropout
- B. Copy number variation
- C. Phasing limitations**
- D. Paternity status

Understanding zygosity in SNVs hinges on knowing how the two alleles are arranged on the chromosomes, i.e., the phase. In prenatal testing, you often observe alleles without clear information about which chromosome copy they sit on. If you can't determine whether two variants are on the same chromosome (in cis) or on opposite chromosomes (in trans), you can't confidently say whether the fetus has two pathogenic alleles or just a single one paired with a normal allele. This phase ambiguity directly affects interpretation for conditions where the outcome depends on whether damaging variants are on different chromosomes, such as autosomal recessive diseases or when assessing combined variant effects across a gene. Methods that reveal or infer haplotypes—like parental genotypes, long-read or linked-read sequencing, or other phasing approaches—help reduce this uncertainty, but limitations in phasing remain a fundamental caveat in fetal SNV zygosity interpretation. Technical artifacts such as allelic dropout or copy number variation can complicate results as well, but they are separate concerns; the core interpretive hurdle here is knowing the correct phase of the alleles.

8. Which amino acid is the first in every collagen triplet?

- A. Glycine**
- B. Proline
- C. Hydroxyproline
- D. Serine

In collagen, the repeating unit is Gly-X-Y, and the interior of the triple helix brings three chains very close together. To fit without steric clashes, the first position in every triplet must be extremely small. Glycine is the only amino acid with just a hydrogen as its side chain, so it fits neatly into that crowded interior at every repeat. Proline and hydroxyproline often occupy the X and Y positions, contributing rigidity, but they're not the first position. If a bulkier residue tried to sit at the first position, the triple helix would destabilize. That's why glycine is the first amino acid in every collagen triplet.

9. What is the main function of tight junctions?

- A. Direct communication between adjacent cells.
- B. Attach cells to the basal lamina.
- C. Allow paracellular transport of ions and molecules.
- D. Seal adjacent epithelial cells and form a barrier.**

Tight junctions mainly act as a seal between neighboring epithelial cells, creating a barrier that prevents free diffusion of solutes and water from one side of the epithelium to the other. This sealing function keeps the lumen and the tissue on the other side in separate compartments and helps establish distinct apical and basolateral membranes, which is essential for directional transport and maintaining cell polarity. The barrier is formed by transmembrane proteins like claudins and occludins, linked to the actin cytoskeleton through scaffold proteins such as ZO-1. Direct communication between cells is the job of gap junctions, not tight junctions. Attaching cells to the basal lamina is the role of adhesion structures like hemidesmosomes and focal adhesions. Tight junctions may permit only selective paracellular passage in some situations, but their primary function is to seal and regulate the barrier between cells, not to actively allow transport.

10. Cadherins typically mediate what type of binding between cells?

- A. Covalent bonding
- B. Ionic binding
- C. Homophilic binding**
- D. Heterophilic binding

Cadherins promote cell–cell adhesion through homophilic, calcium-dependent binding. Each cadherin molecule on one cell binds to the same type of cadherin on the neighboring cell (for example, E-cadherin on one epithelial cell binds to E-cadherin on the adjacent cell). The calcium ions are essential to keep the cadherin extracellular domains properly shaped for this specific, non-covalent interaction, forming strong yet reversible adhesions that help maintain tissue structure. Covalent bonds aren't used in this context, and heterophilic binding would involve cadherins interacting with a different molecule, which isn't the typical mode for classical cadherins.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://mfmmolecular3.examzify.com>

We wish you the very best on your exam journey. You've got this!

SAMPLE