# NBME Histology Practice Test (Sample)

## Study Guide


**Everything you need from our exam experts!**

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# 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

1. **In pemphigus vulgaris, autoantibodies target which epidermal junction, leading to acantholysis?**

   **A. Hemidesmosomes**

   **B. Tight junctions**

   **C. Desmosomes**

   **D. Gap junctions**

2. **Which combination best describes the glomerular filtration barrier?**

   **A. Fenestrated Endothelium, Glomerular Basement Membrane, And Podocyte Filtration Slits**

   **B. Endothelial Cells Only**

   **C. Basal Lamina Only**

   **D. Mesangial Cells Only**

3. **Which cells provide the supportive environment for neurons?**

   **A. Glial support cells.**

   **B. Fibroblasts.**

   **C. Epithelial cells.**

   **D. Smooth muscle cells.**

4. **Which cytoskeletal element serves as tracks for intracellular transport and is the substrate for dynein and kinesin?**

   **A. Microfilaments**

   **B. Nuclear lamina**

   **C. Intermediate filaments**

   **D. Microtubules**

5. **In an experiment, ribosomes detach from the rough endoplasmic reticulum. This would most directly impair the synthesis of which type of proteins?**

   **A. Synthesis of steroid hormones**

   **B. Endocytosis**

   **C. Synthesis of secretory proteins**

   **D. Synthesis of cytosolic proteins**

**6. Which hormone is secreted by the adrenal medulla?**

**A. Aldosterone**

**B. Cortisol**

**C. Noradrenaline**

**D. Epinephrine**

**7. Which mechanism best explains the pathogenesis of intraepidermal blistering with acantholysis and preservation of the basal layer in pemphigus vulgaris?**

**A. Immediate (type I) hypersensitivity reaction to a topically applied agent**

**B. Infection with a herpesvirus**

**C. Development of autoantibodies against desmosomal proteins**

**D. Deposition of IgA-containing immune complexes within dermal papillae**

**8. Which histologic feature distinguishes pancreatic acinar cells from pancreatic islets?**

**A. Acinar cells have basophilic cytoplasm with conspicuous rough endoplasmic reticulum and zymogen granules.**

**B. Islets have basophilic cytoplasm with conspicuous rough endoplasmic reticulum and zymogen granules.**

**C. Islets appear highly vascularized and densely eosinophilic.**

**D. Acinar cells lack zymogen granules.**

**9. What are the main components of a basement membrane, and which type predominates in glomerular basement membranes?**

**A. Basal lamina (type IV collagen and laminin) and reticular lamina (type III collagen); glomerular basement membrane contains type IV collagen primarily.**

**B. Basal lamina (type I collagen) and reticular lamina (type II collagen); glomerular basement membrane contains type I collagen primarily.**

**C. Basal lamina (type II collagen) and reticular lamina (type IV collagen); glomerular basement membrane contains type II collagen primarily.**

**D. Basal lamina (type III collagen) and reticular lamina (type I collagen); glomerular basement membrane contains type III collagen primarily.**

**10. Disruption of Sertoli cell tight junctions would primarily alter the environment of developing germ cells inside which structure?**

**A. Interstitial tissue**

**B. Tubular lumen**

**C. Blood vessels**

**D. Scrotal skin**

# Answers

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

# Explanations

## 1. In pemphigus vulgaris, autoantibodies target which epidermal junction, leading to acantholysis?

A. Hemidesmosomes

B. Tight junctions

C. Desmosomes

D. Gap junctions

**Autoantibodies in pemphigus vulgaris target desmosomes, the cell–cell adhesion junctions between keratinocytes in the epidermis (desmogleins are key components). When these junctions are attacked, keratinocytes lose their connections to each other, causing acantholysis and the formation of intraepidermal blisters just above the basal layer. This contrasts with diseases that target hemidesmosomes (anchoring cells to the basement membrane) and produce subepidermal blisters, or with disruptions of tight or gap junctions which don't primarily cause acantholysis. Acantholysis is a hallmark feature, and clinically this often presents with a positive Nikolsky sign and mucosal involvement.**

## 2. Which combination best describes the glomerular filtration barrier?

A. Fenestrated Endothelium, Glomerular Basement Membrane, And Podocyte Filtration Slits

B. Endothelial Cells Only

C. Basal Lamina Only

D. Mesangial Cells Only

**The glomerular filtration barrier is a three-layer structure: fenestrated endothelium, the glomerular basement membrane, and podocyte slit diaphragms. The endothelial layer has pores that let plasma through while blocking blood cells. The basement membrane acts as a size- and charge-selective sieve, restricting larger proteins. The podocytes with their interdigitating foot processes form filtration slits bridged by slit diaphragms, providing the final barrier to large molecules and helping maintain charge selectivity. Mesangial cells provide structural support and phagocytic clearance, but they are not part of the filtration barrier itself. So the combination of fenestrated endothelium, glomerular basement membrane, and podocyte filtration slits best describes the filtration barrier.**

## 3. Which cells provide the supportive environment for neurons?

**A. Glial support cells.**

**B. Fibroblasts.**

**C. Epithelial cells.**

**D. Smooth muscle cells.**

**Neurons rely on neighboring non-neuronal cells to create a nourishing and protective environment that supports signaling and health. Glial cells do this work: they provide structural support, regulate the extracellular environment, supply metabolic fuel, maintain ion balance, and insulate axons to speed electrical conduction. In the central nervous system, astrocytes help form the blood-brain barrier, take up excess potassium and neurotransmitters at synapses, and shuttle nutrients to neurons. They also give rise to myelin-forming cells in the CNS and assist with repair. Oligodendrocytes myelinate axons in the CNS, while Schwann cells do so in the peripheral nervous system, both increasing conduction speed. Microglia act as resident immune cells, clearing debris and responding to injury. In contrast, fibroblasts, epithelial cells, and smooth muscle cells serve other roles not specific to supporting neuronal function: fibroblasts build connective tissue, epithelial cells line surfaces and cavities, and smooth muscle cells manage contraction. Their activities don't establish the specialized microenvironment that neurons require for efficient signaling, nourishment, and protection.**

## 4. Which cytoskeletal element serves as tracks for intracellular transport and is the substrate for dynein and kinesin?

**A. Microfilaments**

**B. Nuclear lamina**

**C. Intermediate filaments**

**D. Microtubules**

**Intracellular transport uses highways formed by microtubules. These hollow tubes, built from tubulin dimers, provide directional tracks for motor proteins like dynein and kinesin. Dynein typically moves cargo toward the minus end of microtubules (usually toward the cell center), while kinesin carries cargo toward the plus end (toward the cell periphery). Because these motors travel along microtubules, they depend on this cytoskeletal network to move vesicles and organelles efficiently within the cell. Other cytoskeletal elements have different roles—actin filaments support cortical structure and muscle contraction, intermediate filaments give mechanical stability, and the nuclear lamina sits inside the nuclear envelope rather than in the cytoplasm.**

## 5. In an experiment, ribosomes detach from the rough endoplasmic reticulum. This would most directly impair the synthesis of which type of proteins?

**A. Synthesis of steroid hormones**

**B. Endocytosis**

**C. Synthesis of secretory proteins**

**D. Synthesis of cytosolic proteins**

**Ribosome location determines where a protein is synthesized and how it is processed. Ribosomes bound to the rough endoplasmic reticulum specifically make proteins destined for secretion, insertion into membranes, or delivery to lysosomes; these proteins are translocated into the ER lumen as they are being synthesized and then pass through the Golgi for secretion. If ribosomes detach from the rough ER, the direct consequence is impaired production of secretory proteins, because their synthesis relies on the ER-bound ribosomes. In contrast, many cytosolic proteins are synthesized by free ribosomes in the cytosol, so their production would be less directly affected. Steroid hormones are produced mainly in mitochondria and by pathways in the smooth ER, not by rough ER-bound ribosomes, and endocytosis is a cellular process rather than a protein type. Thus, the synthesis most directly impaired would be secretory proteins.**

## 6. Which hormone is secreted by the adrenal medulla?

**A. Aldosterone**

**B. Cortisol**

**C. Noradrenaline**

**D. Epinephrine**

**Epinephrine is the hormone released by the adrenal medulla. The medulla acts like a neural tissue of the sympathetic system, secreting catecholamines into the bloodstream when activated. The dominant hormone produced is epinephrine (adrenaline), which rapidly mobilizes energy by boosting heart rate, dilating airways, and increasing blood glucose to prepare for quick action. A smaller amount of norepinephrine is also released from the medulla, but epinephrine is the primary circulating mediator. Aldosterone and cortisol come from the adrenal cortex, not the medulla, with aldosterone regulating electrolyte balance and cortisol supporting metabolism and stress responses.**

**7. Which mechanism best explains the pathogenesis of intraepidermal blistering with acantholysis and preservation of the basal layer in pemphigus vulgaris?**

**A. Immediate (type I) hypersensitivity reaction to a topically applied agent**

**B. Infection with a herpesvirus**

**C. Development of autoantibodies against desmosomal proteins**

**D. Deposition of IgA-containing immune complexes within dermal papillae**

**Autoantibody-mediated disruption of desmosomes in the epidermis is the key mechanism. In pemphigus vulgaris, IgG autoantibodies bind desmoglein proteins (desmoglein 3, and sometimes desmoglein 1) that hold keratinocytes together. This interference causes loss of cell–cell adhesion between keratinocytes (acantholysis), producing intraepidermal blisters. The basal layer remains attached to the basement membrane via hemidesmosomes, so the bottom layer of cells is preserved, giving a tombstone appearance on microscopy. Immunofluorescence shows an intercellular (fishnet) pattern of IgG throughout the epidermis, consistent with antibody targeting desmosomal components.**

**8. Which histologic feature distinguishes pancreatic acinar cells from pancreatic islets?**

**A. Acinar cells have basophilic cytoplasm with conspicuous rough endoplasmic reticulum and zymogen granules.**

**B. Islets have basophilic cytoplasm with conspicuous rough endoplasmic reticulum and zymogen granules.**

**C. Islets appear highly vascularized and densely eosinophilic.**

**D. Acinar cells lack zymogen granules.**

**Pancreatic acinar cells are enzyme-secreting units of the exocrine pancreas, and their histology reflects that role. Their cytoplasm is rich in rough endoplasmic reticulum, which makes it basophilic, because ribosomes on the RER stain darkly. They also contain zymogen granules—membrane-bound secretory granules packed with digestive enzymes—at the apical region of the cell. This combination of basophilic cytoplasm with conspicuous zymogen granules is the hallmark that sets acinar cells apart from the islets of Langerhans, which are endocrine and have little to no zymogen granules and a less basophilic cytoplasm, reflecting their different secretory needs and vascularization. Thus, the feature described in the correct option—basophilic cytoplasm due to abundant rough endoplasmic reticulum and presence of zymogen granules—best distinguishes acinar cells from islets.**

**9. What are the main components of a basement membrane, and which type predominates in glomerular basement membranes?**

**A. Basal lamina (type IV collagen and laminin) and reticular lamina (type III collagen); glomerular basement membrane contains type IV collagen primarily.**

**B. Basal lamina (type I collagen) and reticular lamina (type II collagen); glomerular basement membrane contains type I collagen primarily.**

**C. Basal lamina (type II collagen) and reticular lamina (type IV collagen); glomerular basement membrane contains type II collagen primarily.**

**D. Basal lamina (type III collagen) and reticular lamina (type I collagen); glomerular basement membrane contains type III collagen primarily.**

**Basement membranes have two layers: the basal lamina, which sits closest to the epithelium, and the reticular lamina, produced by connective tissue. The basal lamina is built mainly from type IV collagen and laminin, forming a supportive meshwork, while the reticular lamina contains more type III collagen. In the kidney's glomerulus, the glomerular basement membrane is a fused basal lamina between endothelial cells and podocytes, and it is predominantly type IV collagen. This makes the description that pairs basal lamina with type IV collagen and laminin, reticular lamina with type III collagen, and notes that the glomerular basement membrane contains type IV collagen primarily, the best fit.**

**10. Disruption of Sertoli cell tight junctions would primarily alter the environment of developing germ cells inside which structure?**

**A. Interstitial tissue**

**B. Tubular lumen**

**C. Blood vessels**

**D. Scrotal skin**

**Sertoli cells create tight junctions that form the blood-testis barrier, dividing the seminiferous tubule into a basal compartment and an adluminal compartment. This barrier establishes a specialized, protected environment for developing germ cells as they progress through meiosis and maturation. If those tight junctions are disrupted, the adluminal (within the seminiferous tubule) environment would be altered because substances from the blood/interstitial fluid could diffuse into the tubule and affect germ cell development. The space that germ cells interact with as they mature is the interior of the seminiferous tubule, i.e., the tubular lumen, so changes would primarily impact that environment. The other options refer to tissues not directly housing the developing germ cells within the seminiferous tubule, so they aren't the primary environment affected by loss of the Sertoli cell barrier.**

# 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://nbmehistology.examzify.com**

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