LSU Health NEW ORLEANS
School of Medicine

# How to Study Biochemistry in Medical School

Biochemistry is about understanding systems and relationships—not memorizing isolated facts. The most effective approach combines active recall, spaced repetition, concept mapping, and clinical application. Here are some research-based study tips to help you study and learn biochemistry.

**Biochemistry success = Understand → Visualize → Retrieve → Repeat → Apply clinically**

**1. Focus on understanding before memorization**

- Biochemistry learning improves when students grasp underlying logic and connections, not just facts
- The subject requires integrating concepts across pathways, enzymes, and physiology
- For each pathway, ask:
  - What is the purpose of this pathway?
  - What regulates it?
  - When is it active clinically?

**2. Use ACTIVE recall (self-testing)**

- Retrieval practice significantly improves learning and long-term retention in science education
- Cognitive science shows active recall outperforms passive studying
- Use flashcards (like Anki), practice questions (the best way to test yourself), white board drawing, or blank-sheet recall
- Try to write pathways or mechanisms from memory

**3. Apply spaced repetition consistently**

- Spaced repetition enhances long-term memory retention in medical education
- It is superior to cramming for durable learning (cramming does not work for long-term memory!)
- Review metabolic pathways repeatedly over time
- Use spaced intervals (1 day → 3 days → 1 week, etc.)

**4. Use concept mapping to connect pathways**

- Concept mapping significantly improves academic performance and deeper understanding in biochemistry.
- It helps organize complex, interconnected information
- Build maps linking:
  - Glycolysis ↔ TCA ↔ ETC
  - Enzyme defects ↔ diseases
- Your maps should try to show how pathways interact

**5. Learn pathways visually and actively (draw them)**

- Biochemistry involves abstract processes that benefit from visual representation and diagram use
- Draw pathways repeatedly (white boards are great for this!)
- Label enzymes, cofactors, and products
- Practice "from scratch" drawings weekly

**6. Study using clinical cases (CBL approach)**

- Case-based learning significantly improves understanding and problem-solving in biochemistry
- Clinical integration enhances motivation and retention
- Link every topic to:

  - Diseases (e.g., PKU, glycogen storage diseases)
  - Drug mechanisms
- Ask: "What happens if this pathway fails?"

**7. Integrate biochemistry with physiology and anatomy**

- Integrated teaching (basic + clinical sciences) improves learning outcomes and retention
- Connect:
  - Metabolism ↔ organ systems
  - Enzyme defects ↔ clinical symptoms
- Study biochem alongside physiology topics

**8. Break content into manageable chunks**

- Biochemistry is cognitively dense; structured learning reduces overload and improves comprehension
- Study one pathway at a time
- Master:
  - Inputs/outputs
  - Rate-limiting steps
  - Regulation

**9. Use multiple learning approaches**

- Multimodal strategies (visuals, practice, discussion, teaching) improve engagement and retention
- Combine:
  - Diagrams & mapping
  - Practice questions
  - Discussion/teaching

**10. Teach others and explain out loud**

- Teaching reinforces understanding and improves long-term retention
- Explain pathways to a peer
- Use the "teach-back" method:
  - If you can teach it → you know it

**Common Pitfalls – Avoid these things**

- Memorizing pathways without understanding regulation
- Cramming metabolic cycles
- Ignoring clinical relevance
- Not revisiting older material
- Studying passively (reading/highlighting only)

**Quick Study Framework (Daily/Weekly)**
**After lecture :** Review concepts (understand the "why")
**Same day:** Draw pathway + active recall
**Evening:** Flashcards (spaced repetition)
**Weekly:** Concept map + clinical cases

Need more help? Schedule an appointment with Dr. Jade J. O'Dell

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