

The logo for Next Step Test Prep is centered in the upper half of the image. It consists of a blue square containing the words "Next Step" in a large, white, sans-serif font, with "Next" on the top line and "Step" on the bottom line. Below "Step", the words "TEST PREP" are written in a smaller, white, all-caps, sans-serif font. The background of the top half of the slide is dark blue with a repeating pattern of small white plus signs. A white inverted triangle shape is cut out from the bottom of this dark blue area, pointing downwards.

Next
Step
TEST PREP

Metabolism (Glycolysis)

Today's Info Session

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MCAT

Medical College
Admission Test

WHAT IS YOUR NEXT STEP?

Introduction

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Who Is Next Step?

Next
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TEST PREP

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Subjects Tested

Chemical and Physical Foundations

30% general chemistry

25% physics

25% biochemistry

15% organic chemistry

5% biology

Bio and Biochemical Foundations

65% biology

25% biochemistry

5% organic chemistry

5% general chemistry

Psychological and Sociological Foundations

65% psychology

30% sociology

5% biology

Biology Content Review

Congrats on making progress through our MCAT course! Today let's focus on bio:

- **Overall study strategies**

 - *Active learning*

 - *Big-picture perspective*

 - *Test-like thinking*

- **High-yield topics**

 - *Topics in genetics*

 - *DNA organization, mutations, post-transcriptional modifications, patterns of inheritance*

 - *Topics in physiology*

 - *Nervous system, topics in endocrinology (overall review, types of hormones, regulation of water balance and reproduction)*

 - *Sample passage*

Biochem Study Strategies

Recurring theme for biochem:

Don't miss the forest for the trees!

When studying, ask yourself ...

- *Why does this matter physiologically?*
 - *Biomolecules: how does chemical structure connect to biological function?*
 - *Pathways: what does a pathway DO?*
- *What are the inputs & outputs of a pathway?*
- *How is a pathway regulated (big-picture?)*
- *Does a pathway have any especially important steps?*



Glycolysis

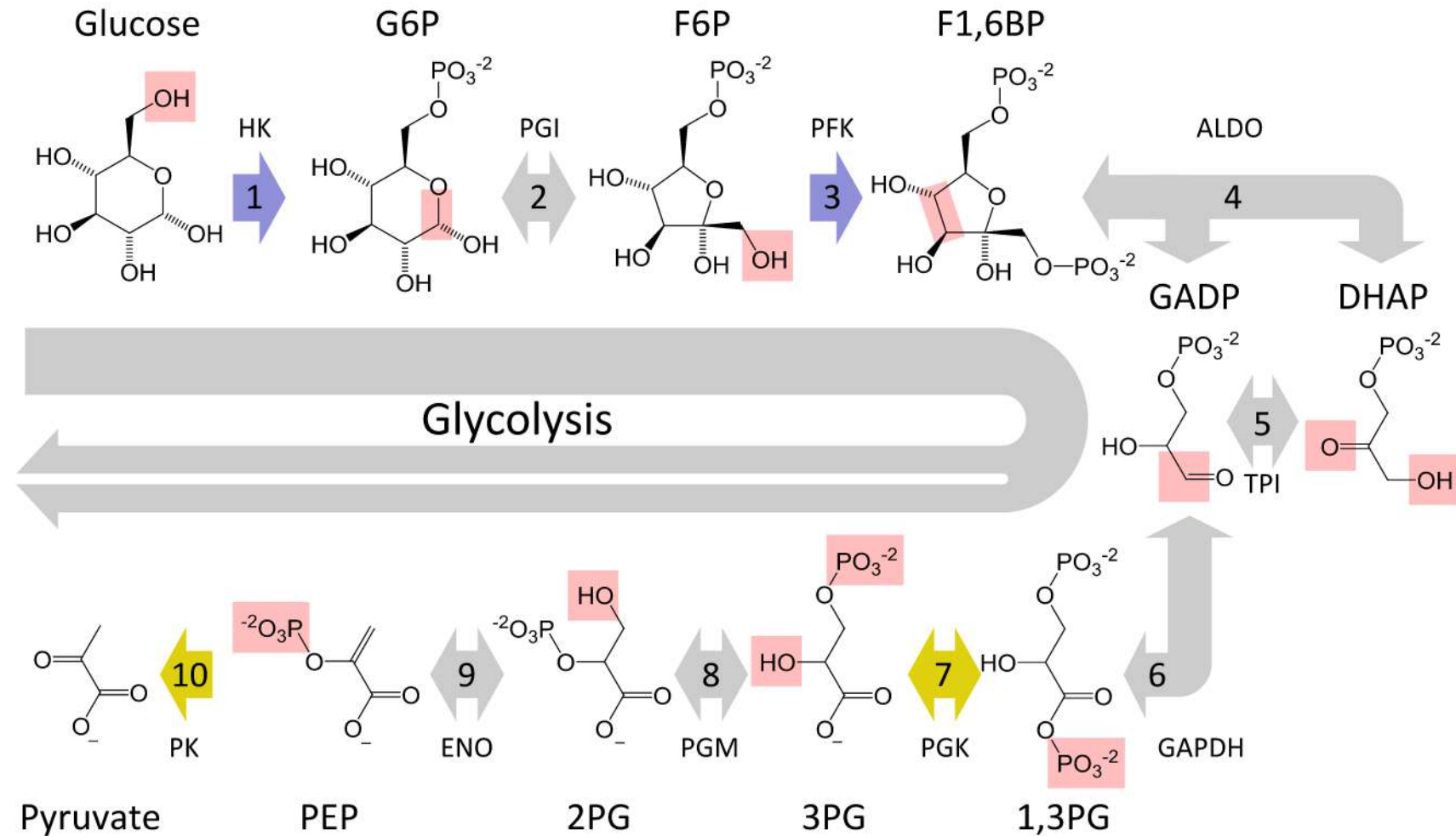
- Breakdown of glucose into pyruvate
 - Net ATP production: 2 molecules
 - 2 NADH molecules are also produced
- Anaerobic
- Products fed into....
 - Citric acid cycle
 - Fermentation
- Occurs in cytosol
- Tightly regulated to avoid futile cycle with gluconeogenesis



Glycolysis

Kinases- adds phosphate
 Phosphatases = Remove P!
 Phosphorylases – Adds phosphate!

- Input: Steps 1-5
- Output: Steps 6-10
- ATP input: Steps 1, 3
- ATP output: Steps 7, 10
- Regulatory points:
 - Step 1 (hexokinase)
 - Step 3 (phosphofructokinase [PFK])
 - Step 10 (pyruvate kinase)
- Committed step: Step 3
 - **PFK1 inhibited** by \uparrow ATP, \downarrow pH, and \uparrow PEP (a downstream product)
 - **PFK1 activated** by \uparrow AMP and fructose 2,6-bisphosphate
- Rate of glycolysis
 - \uparrow when [ATP] is low
 - \downarrow when [ATP] is high



Enzymes and Enzyme Kinetics

What do enzymes do?

- Enzymes are **biological catalysts**.
- Enzymes reduce activation energy of rxn.
- Reduced activation energy → faster rate
- What do enzymes NOT do?
- Major types of enzymes:

Oxidoreductases

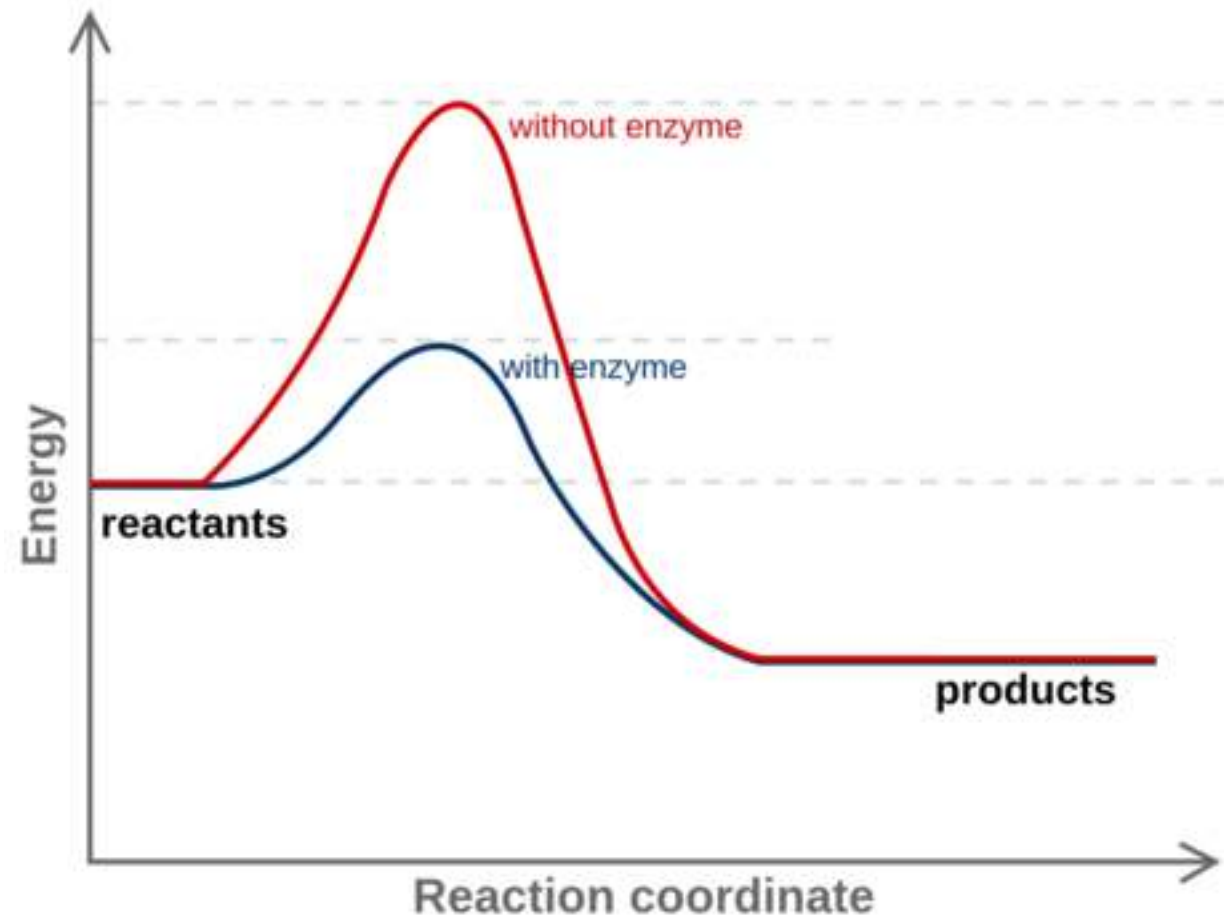
Lyases

Transferases

Isomerases

Hydrolases

Ligases



**Next
Step**
TEST PREP

Q&A

Next Step: Core Values

Next
Step
TEST PREP



Educate Daily



Approachability



Authenticity



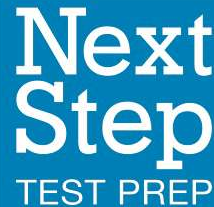
Professionalism



Ownership

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Students Have a Choice



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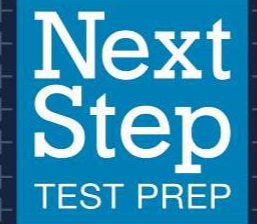
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Representative Practice Exams

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New 2018 MCAT Interface



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Medical College Admission Test - Clara Gillan Time Remaining: 01:21:34 18 of 59

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Figure 1 Eosinophil activation as measured by percent of CD69-positive cells after 3 and 12 hours of co-culture (*p < 0.05, **p < 0.01, ***p < 0.001)

Next, researchers aimed to assess the effect of NK co-culture on eosinophil degranulation. After 3 and 12 hours of co-culture, samples were centrifuged at 1500 rpm, and ECP levels were measured in the supernatants (Figure 2). No ECP was detected in supernatant culture of NK cells alone.

Question 18

Which of the statements below is supported by the experimental results, as shown in Figures 1 and 2?

- A. The duration of Eos co-culture with NK cells directly and linearly correlates to the amount of ECP found in the supernatant after centrifugation.
- B. Cells cultured with a 1:1 NK-to-Eos ratio displayed statistically similar levels of activation to cells cultured with a 5:1 NK-to-Eos ratio, as measured by CD69 expression.
- C. NK co-culture stimulates Eos activation while inhibiting degranulation.
- D. Co-culture with NK cells significantly increased Eos degranulation in all groups, as compared to Eos cells cultured alone.

Periodic Table Review Screen Previous Next

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1-on-1 Personal Tutoring

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