



PRE-ACTIVITY

ASSIGNMENT

2. β -oxidation:

- Takes place in mitochondrion
- Electron acceptors: FAD and NAD^+
- C2 unit product is acetyl-CoA
- Stereochemistry: L- β -hydroxyacyl group
- Hydration

Fatty acid biosynthesis:

- Takes place in cytoplasm
- Electron donor: NADPH
- C2 unit donor is malonyl-CoA
- Stereochemistry: D- β -hydroxyacyl group
- Dehydration

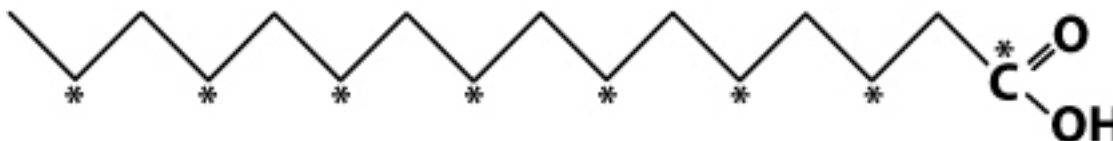
Different pathways needed in order to regulate each independently and to reverse metabolically far from equilibrium steps.

IN-CLASS

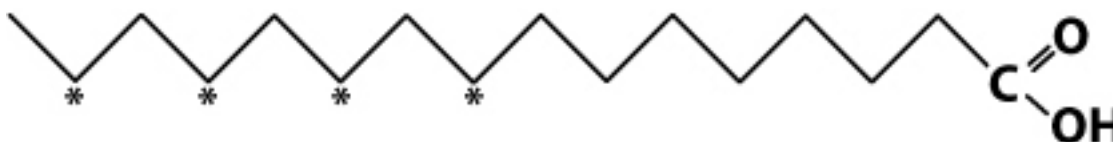
ACTIVITY

Critical Thinking Questions

1. The palmitate will have labels at every other carbon:

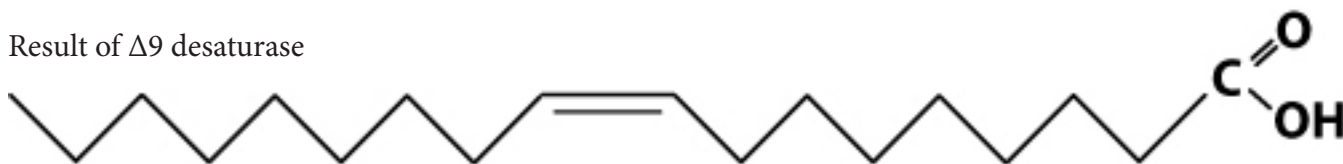


2. The chain grows from the thioester end, not the methyl end. Therefore, the carbons closest to the methyl end will be labeled. The carboxyl end carbons are not labeled:

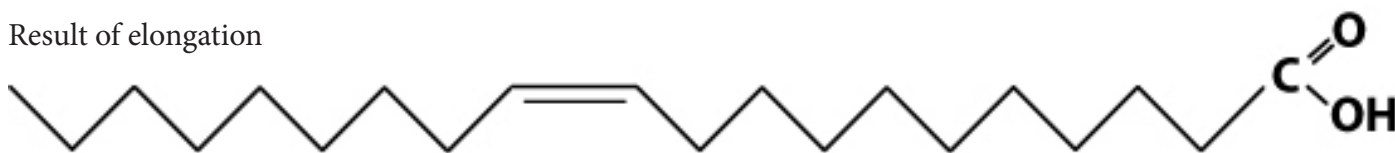


3.

Result of $\Delta 9$ desaturase



Result of elongation



name: **20:1n-9**

4. No – the only desaturases present in mammalian cells are $\Delta 9$, $\Delta 6$, $\Delta 5$, and $\Delta 4$. Therefore, $\Delta 12$ not possible.
5. This is a n-6 or w-6 fatty acids. This is a essential fatty acid. Essential because we do not synthesize it ourselves and must consume it in our diet. Mammals cannot add a double bond beyond carbon 9.
6. This is a n-3 or w-3 fatty acids. This is a essential fatty acid. Essential because we do not synthesize it ourselves and must consume it in our diet. Mammals cannot add a double bond beyond carbon 9.
7. No because new carbon is added to the carboxyl, not methyl end.
8. For the glycerol backbone.
- 9a. Acetoacetate is a ketone body. It is converted to acetyl-CoA, which is used in the TCA cycle.
- 9b. Intermediates of the citric acid cycle are also substrates for other pathways. Unless they are replenished, the catalytic TCA cycle will slow down greatly. Ketone bodies cannot be converted to TCA intermediates, but pyruvate can.
10. HMG-CoA reductatse. Statins

POST-ACTIVITY

SKILL EXERCISES

