**Activity 52: Metabolic Overview**

***Learning Objective***

*Recognize the synergistic relationships between the metabolism of proteins, carbohydrates, and lipids*

**Estimated Completion Time** 30 Minutes

**Instructor Information**

This activity can be used to introduce metabolism, or at the conclusion of a discussion of metabolic pathways as a final review.

**ANSWERS TO QUESTIONS**

1. Pyruvate, glycerol, and amino acids (some).

2. Anything that can be broken down to acetyl CoA can make lipids. Includes some amino acids, monosaccharides, and pyruvate.

3. NADH, FADH2, fatty acids. All nutrients (proteins, lipids, and carbohydrates)

4. H2O, ATP, NAD+, and FAD

5. They get eliminated or are used elsewhere in the body.

6. Answers to this question will depend on when this activity is introduced (at the beginning or at the end of a metabolism discussion) and on how many pathways are discussed during the course.

**Activity 52: Skill Development**

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| Starting reactant | End Product | Pathway | Anabolic or Catabolic? |
| Glucose | Pyruvate | **Glycolysis** | **Catabolic** |
| Pyruvate | Glucose | **Gluconeogenesis** | **Anabolic** |
| Ammonium | Urea | **Urea cycle** | **Catabolic (neutral)** |
| O2, NADH, FADH2 | H2O, ATP | **Oxidative phosphorylation** | **Catabolic** |
| Acetyl CoA | Fatty acid | **Fatty acid synthesis** | **Anabolic** |
| Fatty acid | Acetyl CoA | ** oxidation** | **Catabolic** |
| Acetyl CoA | CO2, NADH, FADH2, ATP | **Citric acid cycle** | **Catabolic** |