

Study Guide for Lecture 29 Pentose Phosphate Pathway (PPP) 2016

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The objectives of the lecture are to:

- Describe the functions of the oxidative and non-oxidative phases of the pentose phosphate pathway in regards to production of NADPH and precursors for nucleic acid synthesis.
- Relate the regulation of the pentose phosphate pathway in response to the biosynthetic needs of the cell.
- Describe the significance of NADPH in protection against highly reactive oxygen species.
- Relate defects in the pentose phosphate pathway to disease conditions (mostly involving glucose 6-phosphate dehydrogenase and transketolase).

In addition:

You **DO NOT** need to memorize all of the reaction intermediates and enzymes. You **DO** need to understand the clinical significance of glucose 6-phosphate dehydrogenase deficiency and transketolase dysfunction.

Know that a “shell game” of carbons in the non-oxidative phase causes six 5 carbon sugars to be rearranged into five 6 carbon sugars.

Know that the non-oxidative phase intersects with glycolysis/gluconeogenesis.

Understand that utilization of the oxidative and non-oxidative phases of the PPP varies depending on the needs of the cell.

Know the function of glutathione and understand the need for NADPH to reduce glutathione.

You are responsible for the Clinical Correlations on hemolytic anemia (16.1) and Wernicke-Korsakoff Syndrome (16.2).