

Chapter 5 Activity: Identifying Macromolecules

Organic macromolecules can often seem large and overwhelming upon first inspection with possibly hundreds of atoms comprising their complex structures. But a closer, more careful look will reveal repeatable patterns of atoms which gives clues to the type of macromolecule. Learning a few simple rules can go a long way to revealing the identity of the macromolecule. The following exercise will help you figure out some of those rules. Work through the questions within your lab group and try to come to a consensus on some ways you could distinguish different macromolecules, filling out the chart at the end.

- 1.) Which of the macromolecules can be composed of carbon (C), hydrogen (H) or oxygen (O) alone?

CARBOHYDRATES, SOME LIPIDS

- 2.) Which of the macromolecules must have their C, H, and O in a 1:2:1 ratio?

CARBOHYDRATES

- 3.) Which of the macromolecules must contain phosphorus (P)?

NUCLEIC ACIDS, PHOSPHOLIPIDS

- 4.) Which of the macromolecules must contain nitrogen (N)?

NUCLEIC ACIDS, PROTEINS

- 5.) If you wanted to label only the RNA in a cell and not DNA, what compound(s) could you label that are specific for RNA?

URACIL; RIBOSE

- 6.) If you wanted to label only the DNA, what compound(s) could you label?

THYMINE; DEOXYRIBOSE

- 7.) An RNA virus contains only RNA and a protein covering. You want to label to tag only the RNA in the virus. Which of the following would you use? Explain your answer.

A. Phosphorus B. Nitrogen C. Sulfur D. Carbon

All macromolecules have carbon so D. is out. Proteins only have sulfur so C. is out. Both nucleic acids and proteins have nitrogen so B. is out. That leaves only phosphorus which RNA but proteins do not.

- 8.) You are given an unknown white powdery substance and are asked to identify it as a carbohydrate or