**Student Worksheet: Parrot pigmentation by functional group**

**Functional groups**

Follow instructions from your teacher to complete this first section with your partner.

1. Compare the molecules aldehyde psittacofulvin and carboxyl psittacofulvin using a Venn diagram.

2. Use a free molecule builder, such as <https://molview.org/>, to build the two molecules and view the three-dimensional structures. How is the two-dimensional structure different than the three-dimensional structure?

3. Organic, or carbon-containing, molecules are often categorized by the functional groups that they contain. Based on the structures of aldehyde psittacofulvin and carboxyl psittacofulvin, how would you describe an aldehyde functional group? What about a carboxyl functional group?

4. Look up general properties of these functional groups. Why do you think scientists would categorize some organic molecules by functional group?

**Paint a parrot by pigment and structure**

Read the article “[A single enzyme can alter the vibrant colors in parrot plumage](https://www.sciencenews.org/article/parrot-feathers-pigment-color-chemical).” Take notes and use information to complete the following prompt:

Find a picture of a parrot and describe its coloration. Explain what scientists might find about the molecular makeup within or on feathers to create each section of color on the parrot. When necessary, indicate the relative amount of the different types of pigments.

**Functions of functional groups**

According to instructions from your teacher, complete the following questions.

1. Read this short [Scientists Say: Amino Acids](https://www.snexplores.org/article/scientists-say-amino-acid) article. What are the functional groups in an amino acid? What basic function do amino acids serve in animals? How do the 20 different amino acids differ from each other?

2. As you’ve seen, functional groups determine many chemical and physical properties of organic molecules. Understanding functional groups’ structure, reactivity and properties is important in many fields. Choose a field that interests you, such as medicine, drug development, immunology, genetics, toxicology, food and product development, material science, etc., and find another example that illustrates the importance of understanding functional groups in a molecular structure.