

## Get To Know A Molecule

### Part 1: Identification

Professor Name:	Patrick Fowler
Course:	Organic Chemistry II (CHM 2211)
Type of assessment:	Primarily writing a research paper, but will also include drawing molecular structures and depicting their reactions.
Scope of Assessment:	Describe how an organic molecule and its reactions affect your body in your daily life.
Purpose of this assessment:	To demonstrate how a knowledge of organic chemistry can be applied in order to better understand the foods, supplements, medicines, cosmetics, and other products that you put in or on your body.

## Part 2: The Assessment

### Directions:

Not only is your body physically made up of organic molecules, but you eat, drink, apply, and contact organic molecules every day of your life. All of these molecules originated through chemical reactions and will interact with your body through more chemical reactions.

Pick an organic molecule that has an important effect on your health and well-being. It can be an ingredient or constituent of a food, beverage, natural supplement, medicine, cosmetic, or other product that you put in or on your body. It could be a substance that has a positive effect, like beta-carotene, or one that has a negative effect, like a trans fat. It can be a natural substance, like a carbohydrate or amino acid, or a synthesized substance, like aspirin.

Start by including your original drawing of the molecule's structure along with a description of the molecule's functional groups and its properties. Explain its role or function, and describe how it is involved with your everyday life.

Explain where it comes from, that is, what natural or industrial chemical processes create the substance. Include your original drawings to depict the most important chemical reactions that are involved. Provide details where possible for these reactions, such as the reactants, conditions, catalysts, solvents, and side-products. Mechanisms using curved arrows are helpful as well.

Then, explain what it does in or on your body, that is, what chemical processes result from the molecule. Again, include your detailed, original drawings to depict the most important chemical reactions that are involved.

Discuss how these reactions are related to those that you have learned about in your chemistry classes. For instance, how carbonyls on sugars are oxidized, or how ester linkages of fats undergo hydrolysis.

Your resources may include chemistry texts, lab manuals, periodicals, or scholarly articles from the web, but be sure to reference all of them properly. Except for the molecule and its reactions, you may include pictures or photos from these sources, but be sure to include captions and appropriate labels on each.

Molecules and reactions may be hand-drawn, or made using chemical drawing software, such as Symyx, but must be original and may not be copied or pasted from any source.

Part 3: Standards of Mastery

Criteria	Outstanding	Well Done	Needs Improvement
<b>Description of Molecule and its Role</b>	Molecular structure is drawn accurately. Important physical properties are all included. Explanation is coherent, relevant, and free of errors.	Drawing has minimal mistakes. Most of the important properties are included. Explanations are generally coherent.	Drawing is incomplete or has errors, basic physical properties are missing, or explanation is incoherent.
<b>Explanation of Molecule's Origin</b>	Explanation is coherent, relevant, and free of errors. Reactions are drawn accurately and provide all relevant details.	Explanations are generally coherent with minimal errors. Drawings of reactions have minimal mistakes and provide the most important details	Drawings of reactions lack important details or have errors. Explanation is incoherent or has major errors.
<b>Explanation of Molecule's Application</b>	Explanation is coherent, relevant, and free of errors. Reactions are drawn accurately and provide all relevant details.	Explanations are generally coherent with minimal errors. Drawings of reactions have minimal mistakes and provide the most important details	Drawings of reactions lack important details or have errors. Explanation is incoherent or has major errors.
<b>Relating the Chemical Processes Involved to Chemistry Coursework</b>	Discussion connects the molecule to topics studied in general and organic chemistry classes. Discussion is also coherent and free of errors.	Connection of molecule to organic chemistry coursework is adequate. Discussion is generally coherent with minimal errors	Connection of molecule to organic chemistry coursework is vague. Discussion is incoherent or has major errors.
<b>References, Web Links, Captions, and Labels</b>	All sources listed in a proper reference format. Titles or descriptions provided along with links for web resources. All non-original pictures are referenced and given a caption and/or labels.	All sources are referenced with minimal errors. All pictures are labeled or captioned.	References are missing or contain errors. Pictures lack labels and captions.

#### Part 4: Rationale

The students will create a work that not only applies their knowledge of organic chemistry, but also gives them the opportunity to examine chemistry that is personally meaningful. They will demonstrate a proficiency at chemistry with processes that affect their daily lives.

By explaining and drawing chemical processes, the students will analyze information about organic chemistry reactions, and synthesize a scientific description of how they happen. This assignment is considerably student-structured, as the students will need to use their own judgment to evaluate which facts and descriptions are relevant and necessary.

Hopefully, this exercise will give students a firm sense that the chemistry and other sciences that they learn about at Valencia College are strongly interrelated with their personal lives and their success.