

Everyday, we are exposed to dozens of chemicals through our own personal care regimen. Personal care products, whether mostly synthetic or “all natural”, have all been carefully formulated by chemists. As your understanding of organic chemistry grows, your ability to compare products and understand why they work the way they do will increase.

Part 1 -- Table (Due Tuesday, October 13, 2009 5 pm; 30 points – hardcopy due to Prof. Liu)

For this assignment...

- Select your favorite personal care product, such as a conditioner or moisturizer, which has several chemicals listed in the ingredient list (at least 3).
- For each ingredient:
 - find and draw a structure (use ChemBioDraw),
 - identify the major functional groups,
 - propose why the compound is present in the product [acting as a solvent, provides fragrance, acting as a surfactant (such as soap), a coloring agent, etc].

Some things may be difficult to identify or be a combination of compounds. For example, floral extracts found in perfumes may be a combination of many organic compounds. Use available resources and do your best to determine key ingredients in the extract. If your attempted searches do not afford the necessary information, consult with Prof. Liu.

For products with many ingredients, *focus on the top five*.

- Tabulate the above information, using the template provided as a guide (next page). Your report (the table) should include the name of the chosen personal care product and a table consisting of four columns. These columns are: an ingredient column, a chemical structure column (use ChemBioDraw), a column for functional groups, and a purpose column.
- **Suggested resources:**
 - A good place to start your search is SciFinder
 - Log in and click on “explore substances”; then click on “substance” from the menu on the left and search the name of your compound.
 - If that fails, “googling” can work very well. However, BEWARE that the web can contain faulty information. You should verify the information you get from one link by checking several other sources (links).
 - As you conduct these searches, keep in mind that Part II of this assignment asks you to summarize information on one of your listed compounds – it might be a good idea to keep track of some of the resources you come across during these initial searches,
- The *purpose of this assignment* is for you to apply your understanding of functional groups in organic molecules to everyday life.
- The *objective of this assignment* is for you to see that organic chemistry is a part of your everyday life.

Your Name

Name (including brand) of personal care product: _____

Ingredient name	Structure (use ChemBioDraw)	List of functional groups	Purpose of chemical

Part 2 -- Paper (The Writing Center is there to help you!)

Pick one of the compounds from your report in Part I. One of the “active” ingredients, or the most abundant compound in your chosen personal care product, would be a good compound to pick.

For this 3-5 page paper, you should do the following:

- Identify the name of your chosen compound (both its chemical name and common name(s), if available)
- Provide general information available from lay literature (including newspapers, encyclopedias, and websites)
- Find at least one primary scientific article regarding your compound
 - Suggested place to start your search:
<http://www.ncbi.nlm.nih.gov.ezproxy.drew.edu/sites/entrez>
(SciFinder also allows you to do a reference search on a compound)
 - Summarize the information in the article, including who the researchers are, where the research was conducted, what the questions/hypotheses were, and what the major findings and conclusions were
 - Note that this article should be on research regarding your chosen compound
 - **Bring a hardcopy of this article to class on Friday, October 23** (10 points)
- Write the entire paper in your own words and provide in-text references (use CSE style) whenever information is provided that is not general knowledge. (You can get your information from anywhere – but you must cite it!!)
- Write your paper for a lay audience (as if you were writing for the *New York Times*). You should strive to be clear and concise. Explain any terms or concepts that would not be obvious to someone whom you might stop along the street. At the end of your paper, include a bibliography (use CSE style). Your references should include the primary article, and all other articles, books and websites used to write the paper.
- Format your paper as follows: Arial, 12-point font, double-spaced, with 1 inch margins. Please spell-check your work and use grammatically correct English.

Due Dates:

Friday, Oct 23, in class: Hardcopy of primary scientific article (10 points)

Wednesday, Oct 28, in class: An annotated bibliography (20 points).

Include: the primary paper, four other references, three “rejected” references.

Thursday, Nov 19, 5 pm: 3-5 page paper (60 points -- hardcopy due to Prof. Liu)

- The *purpose of this assignment* is to develop your information literacy skills with regard to chemical molecules.
- An *objective of this assignment* is for you to become acquainted with primary scientific literature.

How to download ChemBioDraw:

Go to www.cambridgesoft.com a

Click on [register]

Once registered click on [my account]

Select [Download site license software]

Follow instructions to download and install ChemBioDraw

Your serial number can be found by selecting [My Downloads]

Links to PubMed and SciFinder (and many other useful sites!):

<http://www.drew.edu/depts/library/er-subject.aspx?category=Chemistry>

Information regarding CSE style for formatting your bibliography and your in-text references:

<http://library.osu.edu/sites/guides/cse/gd.php>

(The CSE Manual is also available at the library: Reference Counter 808.0666 S416S 2006)

What is an annotated bibliography?

<http://owl.english.purdue.edu/owl/resource/614/01/>

An example of an annotated bibliography (in CSE style):

Liu JM, Livny J, Lawrence MS, Kimball MD, Waldor MK, Camilli A. 2009. Experimental discovery of sRNAs in *Vibrio cholerae* by direct cloning, 5S/tRNA-depletion and parallel sequencing. *Nucleic Acids Research* 37: e46-.

In this research paper, the authors from Tufts University present a new method for identifying small RNAs (sRNAs) in bacteria. The method is extremely high throughput and provides some exciting results. For example, the authors suggest that there are 1000s of sRNAs in a typical bacterial transcriptome. Additionally, the authors characterize one new sRNA in *Vibrio cholerae*, and show that this sRNA may be a repressor of the gene *mtIA*, which is involved in mannitol-metabolism. This will be a great paper to include in the "identification" section of my paper on non-coding RNAs in bacteria.

Liu JM, Liu DR. 2007. Discovery of a mRNA mitochondrial localization element in *Saccharomyces cerevisiae* by nonhomologous random recombination and *in vivo* selection. *Nucleic Acids Research* 35: 6750-6761.

This paper presents original research by scientists at Harvard University in which a localization signal, present in the 3' untranslated region (UTR) of an mRNA is identified. The authors use a relatively new method, NRR, to identify this sequence. While the method is neat, and the research is on non-coding RNA, because the focus is on *S. cerevisiae* (yeast), this article is probably not appropriate for my paper on non-coding RNAs in bacteria.