Introductory Organic and Biochemisty
Applications of Organic Chemistry Activity
Pharmacology

"I tried sniffing coke once, but the ice cubes got stuck in my nose." unknown

What makes something a drug? By definition **drugs** are chemical compounds that affect living processes. Although, the word "drug" has a negative, almost illegal connotation, not all drugs are bad. In fact pharmaceuticals have drastically improved both the quality and quantity of human life. Developing these drugs, understanding how they work and how to dose them is the arena of pharmacology. Benet, Mitchell, and Sheiner describe **pharmacology** as including "the knowledge of the history, source, physical and chemical properties, compounding, biochemical and physiological effects, mechanisms of action, absorption, distribution, biotransformation, and excretion, and therapeutic and other uses of drugs." (The Pharmacological Basis of Therapeutics, 8th Ed., Goodman & Gilman eds., 1990)
For the last several weeks, we've been discussing organic compounds, various functional groups, and their important reactions. In this activity, you will apply some of your organic chemistry knowledge by investigating the pharmacology of a drug of your choosing (clear your choice with me so we don't have any duplicates) in terms of chemistry, metabolism, and action in the body. Your research will result in a short report (two pages minimum typed), a three minute presentation to your peers, and a one page handout for the class.

In your research be sure to include the following topics:

- History of the drug
- Structure of the drug and identification of functional groups
- Chemistry (metabolism and mode of action including reactions involving the functional group(s))
- Effects of the drug (pharmacological properties)
- How the drug is excreted
- Dosage
- Toxic reactions and side effects

I'm not very concerned about the style used in writing the paper (MLA, APA, etc), I mostly want the information and where you got it.

In your presentation you can use Power Point, short film clips, transparencies, posters, and any other visual aide you can think of.

(You are no allowed to pass around the drug for sampling!!!)

You will be given a lab period to get started on the work for your project—at that time the presentation schedule will be discussed.

Classes of drugs to think about with a few examples of each:

Class	examples
Antibiotics	Amoxil, Augmentin, Keflex, Cechlor, Zithromax, Cipro, Bancocyn, Bactrim
Drugs affecting G.I. function	Pepcid, Zantac, Nexium, Propulsid, Prilosec
Cardiovascular drugs	Altace, Calan, Cardene, Inderal, Lasix, Lipitor, Lopressor, Nitroglycerine, Procardia, Plavix, Zestril, Zocor
Drugs affecting renal function	Thiazides, Osmitrol, Diamax, Edecrin, Aldactone, Pitressin, Benemid
Autacoids (anti-inflammatory drugs)	Benadryl, Atarax, Phenergan, aspirin, ibuprofen, acetaminophen, caffeine, theophylline, Indocin
Drugs affecting CNS—anesthetics, sedatives, psychiatric disorders, epilepsy	Benzodiazepines (valium), morphine, halothane, Propofol, lidocaine, cocaine, barbiturates (Phenobarbital), Ambien, thorazine, Seroquel, Haldol, Zyprexa, Abilify, Prozac, Amitryptyline Tegretol, Zorontin, Depakene
Drugs affecting blood--anticoagulants	Coumadin, Heparin
Illicit drugs	LSD, methamphetamine, marijuana, cocaine, heroin, angel dust, roxy

These are only some examples to get you started—you can choose any drug you wish, as long as it hasn't been chosen already.