

CH 242 2002 Research Projects

As you already know from the lab schedule, four weeks of the second half of the semester will be devoted to projects. The purpose of these projects is to provide you with the opportunity to perform experiments that have a research flavor. As a first step, you will need to choose one of the three projects offered this year, and do some background literature research to learn more about that project. You will then need to develop protocols for your laboratory work. It will be necessary for you to become familiar with our library resources, including the use of SciFinder scholar for chemical literature searching. Every project will also need to include a computational component that involves working with the Spartan program in the Schupf lab.

To help you prepare, we require that you submit a preliminary proposal as outlined below. We will need to know which project you choose, and the partner with whom you will be working, no later than **February 18**. Please inform Ms. McIntyre of your decision by that date. The preliminary proposal is due on **March 11 (in class at 10:00)**. The preliminary report should be no more than six pages long including a page of bibliography. The format is as follows:

1. **Background:** This section should include a summary of background information acquired through literature searches, including at least one SciFinder Scholar search. A clear overview of the project's goals should be presented here.

2. **Body of the Proposal:** This section should discuss the specifics of your project including the proposed synthetic approach. For each step of a synthetic scheme, an equation for the reaction must be written. Equations should use structural formulas generated using ChemDraw, ISIS, or other chemical drawing programs. Mechanisms are not necessary – yet. You should also describe how you plan to isolate, purify, analyze, and characterize the products (e.g. NMR, IR, mp, etc.). A brief justification of your choice of analytical tools should be included.

3. **Bibliography:** A copy of the American Chemical Society (ACS) Style Guide is in the Reference section of the Science Library and a second copy is on reserve; chapter six is particularly appropriate. Your bibliography should contain citations for all references used in the preparation of your paper. This includes the web (be sure to include the access date), reference books, texts, laboratory manuals, journal articles, personal communications, etc. *Please attach a copy of a pertinent article found as a result of your SciFinder Scholar search.*

It is certainly appropriate to visit the web to get preliminary information on your topic, but remember that web information is not necessarily accurate and must be viewed with some skepticism. Be sure to use our other library resources in addition to your SciFinder Scholar search. Remember that there are textbooks and laboratory manuals in room 142 of the Science Library for your use.

Your project will account for 300 points of your total lab grade. Since the preparation of this preliminary paper is by no means a minor undertaking on your part, it will be worth 100 of those points.

In drafting your preliminary proposal keep in mind that synthetic protocols of four steps or more are likely to be unrealistic given your time frame of four weeks. You need to purify and characterize the product after each step and such activities take time. Ideally, you want to choose a two or three step synthetic procedure with ample time for work-up. Avoid a one-step synthesis as such an approach will defeat the intent of using the full four weeks productively as a learning experience. Also, please be conscious of costs, and be on the alert for particularly toxic reagents and dangerous reaction schemes. If you are unsure about the feasibility of a reaction, consult Das Thamattoor or Ms. McIntyre. The projects available this year are listed below.

Project 1: Synthesis of α -terpineol, a natural product used in perfumery.

Project 2: Synthesis of melatonin, a hormone of the pineal gland.

Project 3: Synthesis of ibuprofen, a nonsteroidal anti-inflammatory drug.