

BIL 151 Laboratory

Literature Search and Review: Instructions

Before undertaking a research project, it is important to learn

- what is already known about your area of interest
- why it is important and relevant.

Previous research might give you ideas about questions that still need to be addressed.

A **literature search** is an organized search for published material on a selected topic.

A **literature database** allows you to

- search a wide array of journals and other sources
- collect scholarly publications (affectionately known as “pubs”)

Always use databases that retrieve academic sources of high quality and reliability.

An effective literature search takes an organized approach:

1. Decide on a search topic

With your team, formulate a question to narrow and define the topic. For example, if you wish to determine the effect of pH on enzyme activity, you might ask “Does lower pH change the rate of reaction of an enzyme?”

2. Use appropriate keywords

Identify important keywords. In the example above, you might include “enzyme, pH, catalase, acid, alkaline,” or any number of related terms.

- Consider when to use **broad terms**, and when to use **narrower terms** to refine your search.
- Use **synonyms** for your keywords to find every possible variant of the vocabulary used in the research on this topic.
- Use **dictionaries** to check spelling and find keyword synonyms.
- Use **online encyclopedias** (e.g., Wikipedia) to find initial background information that might help you refine your search or choose an area for your research topic.

3. Choose a Database

GoogleScholar is an excellent place to start, but other databases are also available through the UM library system.

4. Perform your Search

- Use **Boolean operators** (AND, OR, NOT - always UPPER CASE) to combine search keywords.
- Truncate (shorten) your keywords to make your search broader.
- If you are not sure how to spell a keyword, use **wildcards**.

(<http://www.oxfordscholarship.com/page/209/wildcards>)

A wildcard is a character (either a ? or a *) used to stand for unknown letters.

- A question mark (?) can be used to represent any one single character.
- An asterisk (*) can be used to represent any number of characters or no character.
- For example, **c?t** will find **cat, cot, cut** whereas **c*t** finds **cat, caught, commencement, conflict, consent, cot, cut**, etc.
- To narrow your search, enclose phrases in quotation marks: “pH effect on catalase”.
- Use the database to search for keywords in different places, such as “title” or “abstract”.
- If you find a useful article by a particular author, search the author’s name to find more pubs.
- If you find a useful article, search its Literature Cited section to find additional, related sources.
- Be sure your literature is recent and current.
- Be sure your literature is from a peer-reviewed, scientific journal.
- Be sure to identify your source as a journal article, a book, a thesis, etc.

5. Determine the availability of the material you wish to reference.

If a desired publication is not available online, contact the **Richter Library Help Desk**.

If our library does not have the publication you need, you can request an **interlibrary loan**.
(Turnaround time is a very good reason to start this assignment promptly.)

Narrowing Your Literature Search

If you do a broad literature search on chemicals that affect the activity of catalase, you may notice that many catalase-inhibiting (or enhancing) compounds **have the capability to strike dead anyone within 2 meters**.

These compounds are not nice to have in a laboratory full of frisky students.

To prevent death and mayhem, we have narrowed the list of reagents available for your experiments to the list below.

The following reagents will be available for your research project.

- **Ascorbic acid**
- **Acetyl salicylic acid (in stock aqueous solution)**
- **Copper sulfate (in stock aqueous solution of less than 0.5M for safety)**
- **Ethanol**
- **Isopropanol**
- **Succinic acid (in stock aqueous solution)**
- **Salts to make buffers of various pH**

If you perform a literature search on any of these compounds with the appropriate keywords, it will **narrow your search** to more relevant publications. These will tell you how these reagents interact with catalase and how you might use them to study their effects on its activity.

Each student should find **three publications relevant to the enzyme research topic** from refereed scientific journals. Once you have done so

- Read each publication completely and analytically.
- Submit to your lab instructor
 1. the **three publications**
 2. a completed **Literature Search Template** (linked to the online syllabus)

Unless directed otherwise, submit assigned materials electronically to your Laboratory Instructor, who will explain submission procedures for his/her preferred venue (email, Blackboard, etc.).