Literature Review Exercise (individual work)

A literature review, is a report of published information pertaining to a topic of interest. It enables a researcher to determine what is known and what further research can be conducted. A literature review is not just a compilation of information. It includes the analysis and interpretation of the significance and implications in light of a problem that the researcher defines. A literature review may be a complete report or it may be a part of another report.

In this exercise you will do the following:

a) Decide on a topic of interest. This may be an area of research you would like to undertake for your SMTP project later.
b) Do a quick evaluation of **5 or more** articles you wish to use for your literature review. Evaluate them in the following aspects:
    - Relevance to your topic of interest
    - Currency of article (published 4-5 years ago preferably) or website (Is it dated? Do not cite facts or statistics that are not dated.)
    - Is the article peer reviewed (a scholarly paper see below "Scholarly vs Popular")?
    - Author's authority/credibility
    - Publisher (For papers and books: commercial or academic? For websites: edu, gov, org, com or net?)
    - Does the article come with a bibliography? This gives you an idea whether the author has referred to other sources and helps to validate the content of the article.

    For websites, there should be links or footnotes that list down references and further resources.

    - Is the article biased in any way?

c) Your 5 articles should include 3-4 peer reviewed research papers, 1-2 credible website(s) (excluding PDF files of papers you found on the internet).
d) Read each article and summarise what it says in your area of study.

e) Write a literature review of 500 words on your topic of interest.

Points to note when writing your literature review:

1. Be sure to understand your research topic/question before you begin.

2. Select sources that cover all or most sub-areas of your research topic. Do not leave areas unexplored as far as possible.

3. Read your sources with an end in mind, making notes on relevant information --- this will help you compile what you have read in your review.

4. Your review should give the audience an idea of what is already known about your research topic.

5. Searching for relevant sources takes time, so start early!

6. As you do your literature review, you might make modifications to the scope of your study depending on your findings.

Useful references:

[1] How to write a lit review: http://library.concordia.ca/help/howto/litreview.php

[2] Evaluating sources of information:
http://www.lib.berkeley.edu/instruct/guides/evaluation.html

Scholarly vs Popular
(Extracted from: http://www.lib.berkeley.edu/instruct/guides/evaluation.html)

A **scholarly journal** is generally one that is published by and for experts. In order to be published in a scholarly journal, an article must first go through the **peer review** process in which a group of widely acknowledged experts in a field reviews it for content, scholarly soundness and academic value. In most cases, articles in scholarly journals present new, previously un-published research. Scholarly sources will almost always include:

- Bibliography and footnotes
- Author's name and academic credentials

As a general rule, scholarly journals are not printed on glossy paper, do not contain advertisements for popular consumer items and do not have colorful graphics and illustrations (there are, of course, exceptions).

Popular magazines range from highly respected publications such as *Scientific American* and *The Atlantic Monthly* to general interest newsmagazines like *Newsweek* and *US News & World Report*. Articles in these publications tend to be written by staff writers or freelance journalists and are geared towards a

general audience. Articles in popular magazines are more likely to be shorter than those in academic journals. While most magazines adhere to editorial standards, articles do not go through a peer review process and rarely contain bibliographic citations.

A good resource that provides background information to help you evaluate periodicals is:

Magazines for Libraries (Doe Reference AP1.21.K3 Directories).

Tip: When searching a journal index such as Expanded Academic ASAP, try narrowing your search by limiting to **refereed publications**. This will retrieve only scholarly journals matching your search terms. Some other journal indexes offer this or a similar option.

If you do your searches in Web of Science, you will retrieve only scholarly articles since only academic journals are indexed in this database.

Sample Literature Review

Project title: Investigating the Anti-bacterial Properties of Metal and Metal Oxide Nanoparticles

Done by: Lim Jue Min, Jeremy (4N07)

State a fact and cite ref.

In recent years, there has been growing interests and investments in research on nanomaterials, minuscule substances having at least one dimension within the nanometer scale, including nanoparticles, nanowires and nanofilms (Cao, 2006). At the nanometer scale, these materials exhibit vastly different physical and chemical properties from their bulk materials: crystals in the nanometer scale have much lower melting points, ferromagnetic materials may lose their ferromagnetism when diminished to nanometer size, semiconductors become insulators and vice versa, solids become liquids at room temperature and pressure, and inert chemicals like gold become excellent catalysts. In addition to these are biological anti-bacterial properties. Nanomaterials have such amazing properties because of their high proportion of surface atoms, in comparison to bulk materials. Thus, there are more atoms at the surface with unsaturated bonds, capable of taking part in interactions.

The antibacterial properties of nanoparticles are of interest because of their obvious potential applications. Some metal-based nanoparticles, particularly silver nanoparticles, exhibit excellent bacteriocidal and bacteriostatic properties (Sondi & Salopek-Sondi, 2004; Panacek *et al*, 2006). It is well known that silver ions and silver-based compounds are highly toxic to as many as 12 species of bacteria, including *E. coli* (J.S. Kim *et al,* 2007). According to Kim *et al*. (2007), the mechanism of the inhibitory effects of Ag ions on microorganisms is only partially known. Several studies (Hamouda *et al*, 2000; Dibrov *et al*, 2002; Dragieva *et al*, 1999) have reported that the positive charge on the Ag cation plays a key role in its antimicrobial activity via electrostatic attraction between the negatively charged cell membrane of microorganism and positively charged nanoparticles. In other studies

Other in –text citing styles

investigating the killing mechanisms of silver nanoparticles, the antimicrobial activity of silver nanoparticles on Gram-negative bacteria was correlated to the concentration of Ag nanoparticles, which governs the formation of pits in the bacterial cell wall, allowing the accumulation of silver nanoparticles to affect the membrane's permeability, resulting in cell death (Sondi & Salopek-Sondi, 2004). A report by Lok *et al.* (2006) states that silver nanoparticles have been found to destabilize the bacterial outer membrane and deplete the levels of intracellular ATP. Several recent publications postulate that silver nanoparticles may adhere to the surface of the cell membrane, thereby disrupting cellular functions such as permeability and respiration (Panacek *et al*, 2006); silver nanoparticles may cause damage, after penetration, by interacting with phosphorus- and sulphur-containing compounds, including DNA, for silver tends to have a high affinity to react with such compounds (Hatchett, 2004).

Given the high toxicity of silver nanoparticles on bacteria, there are extensive biological, biomedical, and pharmaceutical applications (Sondi & Salopek-Sondi, 2004) of nanoparticles exhibiting antibacterial properties, including widespread products where bacterial growth should be inhibited. The antibacterial activity of the nanoparticles may be used in medicine to reduce infections in burn treatment, arthroplasty, to prevent bacteria colonization on prostheses, catheters, vascular grafts, dental materials and dental resins, as well as integration into textile fabrics, or even for water treatment (Panacek *et al*, 2006). In addition, they can be incorporated into domestic and car air-conditioner filters, floor drain traps, shoe and insole lining, bandages or plasters, refrigerators, storage containers, and antibacterial soaps, detergents or washing liquids.

References

Cao, G. (2006). *Nanostructures & Nanomaterials*. London: Imperial College Press. 433pp.

Dibrov P. *et al.* (2002). Chemiosmotic mechanism of antimicrobial activity of Ag(+) in Vibrio cholerae. *Antimicrob Agents Chemother*, 46: 2668-70.

Dragieva I. *et al*. (1999). Complex formation in solutions for chemical synthesis of nanoscaled particles prepared by borohydride reduction process. *Nanostruct Mater*, 12: 267-70.

Hamouda T. *et al*. (2000). A novel surfactant nanoemulsion with a unique non-irritant topical antimicrobial activity against bacteria, enveloped viruses and fungi. *Microbiol Res* 156: 1-7.

Hatchett, D. W., Henry, S. J. (2004). *Phys. Chem.*, 100: 9854-9859.

Kim J.S. *et al*.(2007). Antimicrobial effects of silver nanoparticles. *Nanomedicine: Nanotechnology, Biology, and Medicine*, 3, 96: 95-101.

Lok, C.N. *et al*. (2006). Proteomic analysis of the mode of antibacterial action of silver nanoparticles. *J Proteomic Research*, 5(4): 916-24

Panacek, A. *et al*. (2006). Silver colloid nanoparticles: synthesis, characterization, and their antibacterial activity. *J Phys Chem B Condens Matter Mater Surf Interfaces Biophys*, 110(33):16248-53.

Sondi, I., Salopek-Sondi, B. (2004). Silver nanoparticles as antimicrobial agent: a case study on *E. coli* as a model for Gram-negative bacteria*. Journal of Colloid and Interface Science*, 275: 177-182.

More in-text citing styles:

- Studies by Mitch and Albom (1999, 2003) showed that … …
- It was observed by Merck (1997) that … …
- John *et al* (2007) reported that … …
- Sondi (2001) found that … …