Critical Analysis of Scientific Information

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Navigating the information universe

- UBC Library resources
- Search engines
- Databases
- Protocol searching
Library services

- Library website - help & resources
  http://services.library.ubc.ca/user-guides/graduate-students/?login

- Research Commons
  - Citations
  - Thesis help
  - Statistics
  http://koerner.library.ubc.ca/services/research-commons/
• Find recent papers - "since year"
• Pick up specific terminology from Wikipedia etc to get more targeted search keywords
• Too advanced? "References"
• Too basic? "Cited by"
Boolean Operators

And
Automatically implied

Or
Must be in CAPS

Not
Boolean NOT is the minus sign "-" and must be in front of each word you want to exclude.
More search tips

- “Phrase searching”
  - Quotation marks around phrases "complement cascade"
- Include
  - Use + immediately before automatically excluded search terms that you want included +blood
- Find results with your search term in the document title intitle:membrane
- author:Conway
Creating email alerts

1. Search your topic then click the Create email alert icon

2. Check the Alert query details, then enter your email address and click Create alert
Databases

- Find academic papers
- Easily build your citation library - EndNote
PubMed

PubMed comprises more than 26 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

Using PubMed
PubMed Quick Start Guide
Full Text Articles
PubMed FAQs
PubMed Tutorials
New and Noteworthy

PubMed Tools
PubMed Mobile
Single Citation Matcher
Batch Citation Matcher
Clinical Queries
Topic-Specific Queries

More Resources
MeSH Database
Journals in NCBI Databases
Clinical Trials
E-utilities (API)
LinkOut

You are here: NCBI > Literature > PubMed

GETTING STARTED
NCBI Education
NCBI Help Manual
NCBI Handbook
Training & Tutorials
Submit Data

RESOURCES
Chemicals & Bioassays
Data & Software
DNA & RNA
Domains & Structures
Genes & Expression
Genetics & Genomics
Genomes & Maps
Hormones
Literature
Proteins
Sequence Analysis
Taxonomy
Variation

POPULAR
PubMed
Bookshelf
PubMed Central
PubMed Health
BLAST
Nucleotide
Gene
SNP
Gene
Protein

FEATURED
Genetic Testing Registry
PubMed Health
GenBank
Reference Sequences
Gene Expression Omnibus
Map Viewer
Human Genome
Mouse Genome
Influenza Virus
PrimerBLAST
Sequence Read Archive

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Protocol searches

- Get specific information about methods
Agarose Gel Electrophoresis for the Separation of DNA Fragments

Pei Yun Lee1, John Costumbrado1, Chih-Yuan Hsu2, Yong Hoon Kim3

1Department of Molecular, Cell, and Developmental Biology, University of California Los Angeles

Summary

A basic protocol for the separation of DNA fragments using agarose gel electrophoresis is described.

Date Published: 4/20/2012, Issue 62, doi: 10.3791/3923

Keywords: Genetics, Issue 62, Gel electrophoresis, agarose, DNA separation, ethidium bromide

Cite this Article

Get practical advice from other researchers
Navigating the information universe

- UBC Library resources
- Search engines
- Databases
- Protocol searching
Paper chase

Use any search engine/database to find a recent (2016) paper given this abstract:

"While some studies suggest that nutritional supplementation may reduce aggressive behavior in children, they have not examined whether its efficacy may be enhanced in conjunction with other treatment approaches. This study tests the hypothesis that a nutritional supplementation of omega-3, multivitamins, and minerals over 3 months, combined with cognitive behavior therapy, will reduce childhood aggression."

1. What is the title of the paper?
2. Who is the first author?
3. What was your search strategy (keywords, Boolean operators etc) did you use?
Effective reading of scientific papers

Where do I start?

Where do I find the information I need?

How accurate is this information??
Where do I start?

- Skim
- Re-read
- Interpret
- Summarize

- What's the big picture?
- How did they conduct the study?
- What do the results mean?
- Do the results match the conclusions?
- What were the main findings of the paper?
Structure of a scientific paper

- Abstract
- Introduction
- Materials & methods
- Results
- Discussion
- References
CHOPPED!!

NIH Public Access
Author Manuscript
Obesity (Silver Spring). Author manuscript; available in PMC 2011 February 1.

Water Consumption Increases Weight Loss During a Hypocaloric Diet Intervention in Middle-aged and Older adults
Elizabeth A. Dennis¹, Ana Laura Dengo¹, Dana L. Comber¹, Kyle D. Flack², Jyoti Savla³, Kevin P. Davy¹, and Brenda M. Davy¹
¹ Department of Human Nutrition, Foods and Exercise, Virginia Tech, Blacksburg, Virginia, USA
² Department of Health Sciences, Ferrum College, Ferrum, Virginia, USA
³ Department of Human Development and Center for Gerontology, Virginia Tech, Blacksburg, Virginia, USA

You have 20 seconds to write down which section you picked up, and answer the question.

6. When was the first article on the topic of water consumption & weight loss published?
1. Which group had the most decline in weight loss?
2. What were participants given as compensation for participating in the study?
3. Did previous studies find an association between water consumption and weight loss?
4. How many people from the "nonwater" group were included in the analysis?
5. Name one limitation of the study.
6. When was the first article on the topic of water consumption & weight loss published?
7. Was there a difference between weight loss outcomes between men & women?
8. What is the hypothesis of the study?
9. Name one condition for which individuals were excluded from the study.
10. What was the conclusion from the study?
Answers??
Break time!

Please come back in groups of 4
Discussion

• Where were you most likely to find general information? What about specific information?

• Which section would you use to quickly get an idea about the "big picture"?

• What would be your strategy for speed reading a large volume of scientific papers?
Critical Analysis of scientific papers

The art of scientific skepticism
Aims of the study

- Is the hypothesis clearly stated?
- What experiments is the researcher aiming to do?
Sample

- Is the sample large enough to detect effect?
- Is there potential for bias? In which direction?
Research design

- Does the study design address the hypothesis being tested?
- How are outcomes measured?
Data analysis

- Are appropriate statistical tests used for the data obtained?
- Are key data discussed clearly shown in the tables and figures?
Discussion & conclusions

- Do the conclusions fit with other scientific evidence? If not, why?
- Are study limitations mentioned and discussed?
Ethics

- Are there any conflicts of interest?
- Are the animal or human ethics standards met?
Anecdotal Evidence

Nutritional supplementation to reduce child aggression: a randomized, stratified, single-blind, factorial trial

Adrian Raine, Rose A. Cheney, Ringo Ho, Jill Portnoy, Jianghong Liu, Liana Soyfer, Joseph Hibbels, and Therese S. Richmond

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do:10.1111/jcpp.12565

In groups, use the checklist to analyze your section of the article.

Would you include this paper in your citations?
Group 1 Introduction
Group 2 Methods
Group 3 Results
Group 4 Results
Group 5 Discussion
Group 6 Discussion
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