

# CBR Critical Analysis of Scientific Information

Tara Fernandez  
Conway Lab



**CBR**

# **Critical Analysis of Scientific Information**

**Tara Fernandez**

**Conway Lab**





# **Navigating the information universe**



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



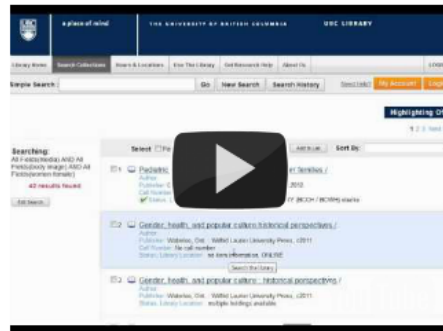


# Library services



- Library website - help & resources

<http://services.library.ubc.ca/user-guides/graduate-students/?login>



- Research Commons

- Citations
- Thesis help
- Statistics

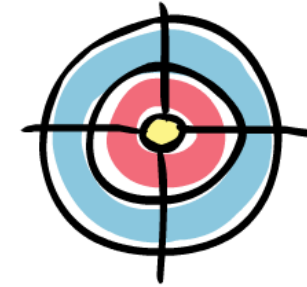
<http://koerner.library.ubc.ca/services/research-commons/>





- 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

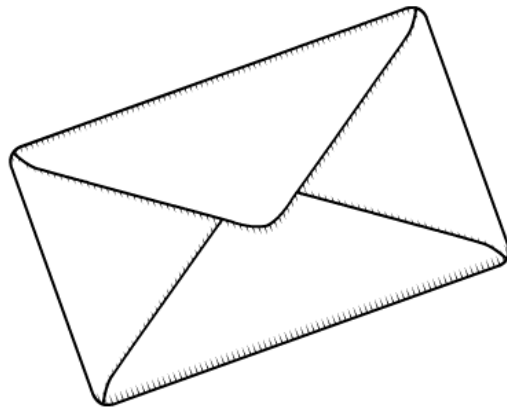
## Not

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

# More search tips

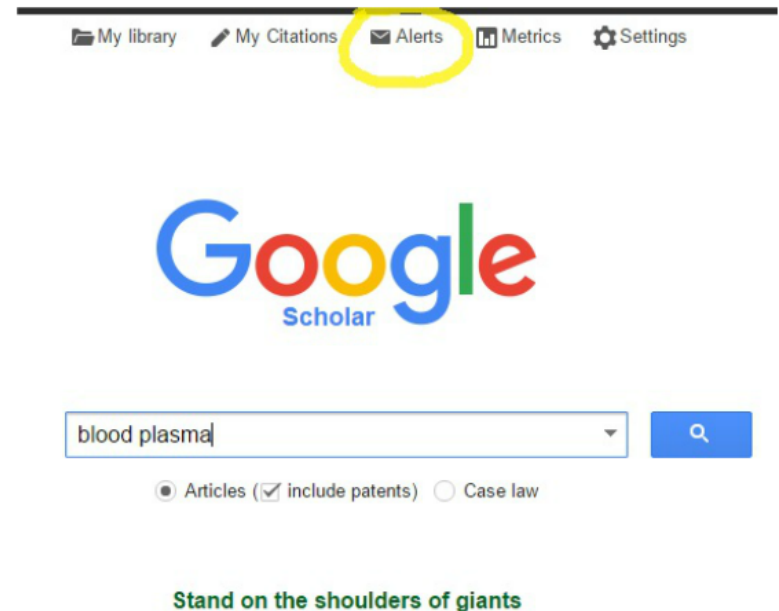


- “Phrase searching”
  - Quotation marks around phrases  
“complement cascade”
- Include
  - Use + immediately before automatically excluded search terms that you want included +blood
- Find results with your search term in the document title intitle:membrane
- author:Conway



# 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




[illegible]

-



# PubMed


[NCBI](#) [Resources](#) [How To](#) [Sign in to NCBI](#)



US National Library of Medicine  
National Institutes of Health

PubMed  [Search](#)


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### 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.

### PubMed COMMONS



Featured comment - May 12  
Connecting the data: S Ray@soupvector links genomic sequences entries for publication on viral co-infection.  
[1 usa.gov/1SwnQzr](#)

#### Using PubMed

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#### More Resources

- [MeSH Database](#)
- [Journals in NCBI Databases](#)
- [Clinical Trials](#)
- [E-Utilities \(API\)](#)
- [LinkOut](#)

You are here: [NCBI](#) > [Literature](#) > [PubMed](#) [Write to the Help Desk](#)

#### 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 & Medicine](#)
- [Genomes & Maps](#)
- [Homology](#)
- [Literature](#)
- [Proteins](#)
- [Sequence Analysis](#)
- [Taxonomy](#)
- [Variation](#)

#### POPULAR

- [PubMed](#)
- [Bookshelf](#)
- [PubMed Central](#)
- [PubMed Health](#)
- [BLAST](#)
- [Nucleotide](#)
- [Genome](#)
- [SNP](#)
- [Gene](#)
- [Protein](#)
- [PubChem](#)

#### FEATURED

- [Genetic Testing Registry](#)
- [PubMed Health](#)
- [GenBank](#)
- [Reference Sequences](#)
- [Gene Expression Omnibus](#)
- [Map Viewer](#)
- [Human Genome](#)
- [Mouse Genome](#)
- [Influenza Virus](#)
- [Primer-BLAST](#)
- [Sequence Read Archive](#)

#### NCBI INFORMATION

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# Web of Science

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×

Topic ▾

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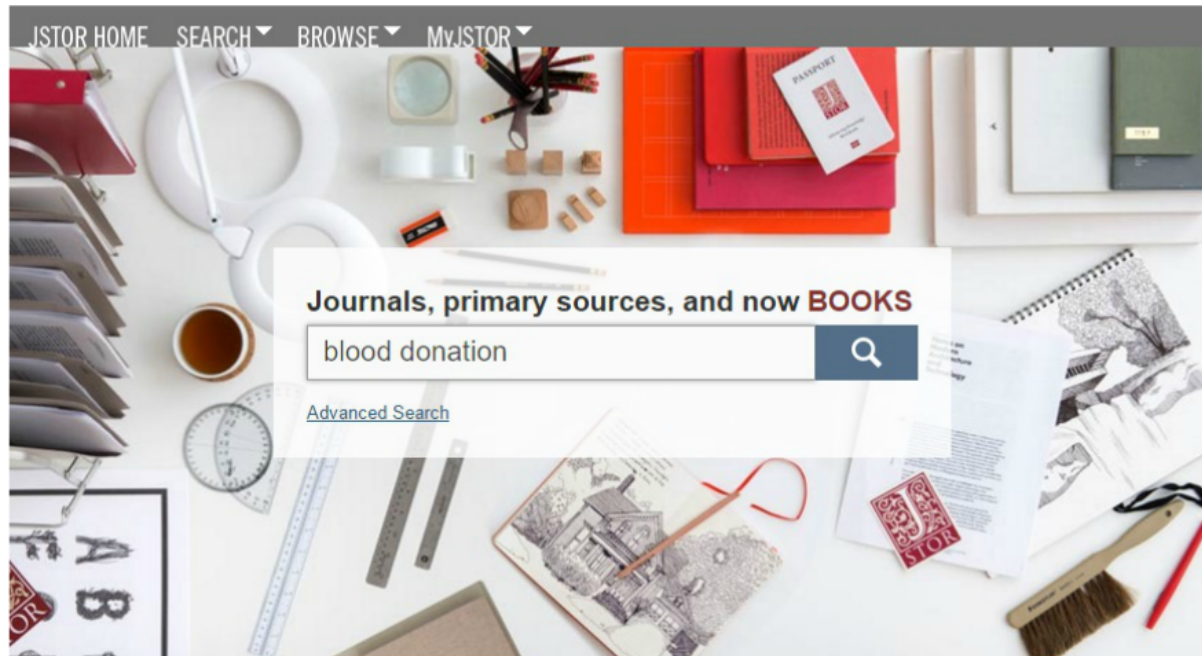
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# Protocol searches



- Get specific information about methods



# Protocol Online

The screenshot displays the Protocol Online website, which serves as a comprehensive resource for laboratory protocols. The header features the site's logo, navigation tabs for Home, Protocol, BioForum, BioProduct, BioTool, PubAlert, BioBlog, and BioJob, and a search bar. The main content area is organized into several sections: Protocol Categories (listing fields like Animal Techniques, Biochemistry, and Cell Biology), Popular Categories (listing specific techniques like Cell Culture and PCR), Latest Scientific Breakthroughs (highlighting recent research articles), Imaging Techniques, Immunology, Media & Solutions, Microbiology, Model Organisms, Molecular Biology, Neuroscience, Physiology, Plant Biology, and Research Tools. A right sidebar includes a 'Watch Video Protocols' section with a JoVE link, a Google search box, a 'Latest Forum Discussion' list, a 'Forum Archives & Topic Index', a 'Journals' list, and a 'Position Open - Free Job Listing' section.

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Your lab's reference book

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Protocol Search  Go [Advanced Search](#)

**Protocol Categories**

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- Bioinformatics & Biostatistics**  
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- Model Organisms**  
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- Molecular Biology**  
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- Neuroscience**  
[Neuroanatomy, Neurophysiology...](#)
- Physiology**  
[Hematology...](#)
- Plant Biology**  
[Photosynthesis, Tissue Culture...](#)
- Research Tools**  
[Online Tools, Software](#)

**Popular Categories**

- Cell Culture
- PCR
- RNA
- DNA Isolation
- Immunohistochemistry

**New Technologies**

- Stem Cells -> iPS Cell Protocols
- Real-Time PCR
- RNA Interference
- Epigenetics
- ChIP Assay

**Top Search Terms**

- facts
- pcr
- protein extraction
- western blot
- immunoprecipitation

**Latest Scientific Breakthroughs**

- Articles in Press from Nature, Science, Cell, etc.
- Strongly correlated perovskite fuel cells** (Nature, 2016-05-16)
- [Research Article] Electron-scale measurements of magnetic reconnection in space** (Science, 2016-05-12)
- [Report] Control of neuronal synapse specification by a highly dedicated alternative splicing program** (Science, 2016-05-12)
- [Report] Thresholds and ultrasensitivity from negative cooperativity** (Science, 2016-05-12)

[More...](#)

**Search Protocol Online using Google**

Google Custom Search

**Latest Forum Discussion**

- Is it how total cDNA should look like?** (by Angrysh)
- Possible mycoplasma contamination?** (by JDSBlueDevil)
- Looking for dataset of proteotypic and non-proteotypic peptide** (by Diver777)
- Cell detachment in clonogenic assay** (by JDSBlueDevil)
- Degarelix Benefits to Reduce the Risk of Cardiovascular Events in Prostate Cancer** (by Chloe Mica)
- Mini-circle DNA prep after attP and attB interaction what sequence remains?** (by Chris22)
- Problem with polyA retrotranscription: I have truncated products** (by RanaRNA)
- bacterial ma isolation** (by gorkem)
- Can I use Duran bottle instead of erlenmeyer for fungal fermentation?** (by atea)

[Enter](#)

**Forum Archives & Topic Index**

BioForum Indexed by disciplines and by topics with easy browsing and fast search

- 1999-2009
- 2009-present

**Journals**

- Journal of Biological Methods
- Bladder Journal

**Position Open - Free Job Listing**

- POSTDOCTORAL POSITIONS IN BIOCHEMISTRY, BRAZIL
- Postdoc - Vascular biology (Yale University)
- Sales/Packaging Assistant (Code: SP003)
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# Jove: video protocols

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## 8 Agarose Gel Electrophoresis for the Separation of DNA Fragments

Pei Yun Lee<sup>1</sup>, John Costumbrado<sup>1</sup>, Chih-Yuan Hsu<sup>1</sup>, Yong Hoon Kim<sup>1</sup>

<sup>1</sup>Department of Molecular, Cell, and Developmental Biology, University of California Los Angeles

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     185



0:05 Title

1:31 Preparation of the Gel

3:21 Setting up Gel Apparatus and Separating DNA Fragments

4:55 Observing Separated DNA Fragments

5:43 Results: Agarose Gel Electrophoresis of PCR Products

6:23 Conclusion

This article is **Open Access**.

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### Related Videos



Electroeluting DNA Fragments  
Published 9/05/2010



Electrophoretic Separation of Proteins  
Published 6/12/2008



Denaturing Urea Polyacrylamide Gel...  
Published 10/29/2009



Streamlined Purification of Plasmid DNA From...  
Published 1/05/2011

Translate text to:

### 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

<http://www.jove.com/video/3923/agarose-gel-electrophoresis-for-the-separation-of-dna-fragments>



# Research forums



https://www.researchgate.net/topics

R<sup>6</sup> HOME QUESTIONS JOBS

Q&A Get answers to your research questions and share your expertise.

Enter your question 150 Ask

Questions we think you can answer

Laura Pietrovito asked a question:

**Does anyone have ever see green dots in CFSE stained cancer cells in a boyden chamber assay ?**

Cancer cells stained with CFSE were allowed to migrate through boyden chamber. When observed under a fluorescence microscope they show intracellular intense green dots (see attachment). Does [more]

2 answers added Follow Answer

Marilyne Blain asked a question:

**Semi-qualification for ELISA kit - suggestion ?**

Hi , I need to perform a semi-qualification test on my ELISA kit, I search on google and i'm not 100% sure of what i'm should do, could you help me. I was planning to test the LOD and LOQ , with [more]

New Be the first to answer Follow Answer

Campbell Reece asked a question:

**Why do I obtain so many adherent cells from BMDC culture?**

Hi, I'm trying to generate BMDCs using the most conventional protocols (those of Lutz or Inaba) I'm using recombinant GM-CSF (20 ng/ml) and plastic petri dish. The problem is that most of my [more]

Questions we think you can answer

Recent questions in your field

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Fred Hutchinson Cancer Research Center  
Seattle, United States

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Fred Hutchinson Cancer Research Center  
Seattle, United States

Post-Doctoral Research Fellow - Adoptive T Cell Immunotherapy

Get practical advice from other researchers



# **Navigating the information universe**



- UBC Library resources
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- 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?

How accurate is this  
information??

Where do I find the  
information I need?

Where do I start?



- What's the big picture?

- **Skim**

- **Re-read**

- **Interpret**

- **Summarize**

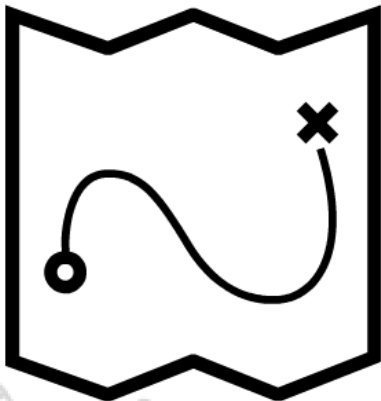
- How did they conduct the study?
- What do the results mean?

- 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!!



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

l the  
ight



nts  
for  
dy?

9. Name one c  
excluded from

8. What is the hypothesis o



6. When was the first  
article on the topic of  
water consumption &  
weight loss published?



Prezi

3. Did previous studies find

**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 & 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!



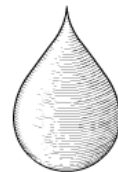
**Please come back in groups of 4**

# Discussion

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



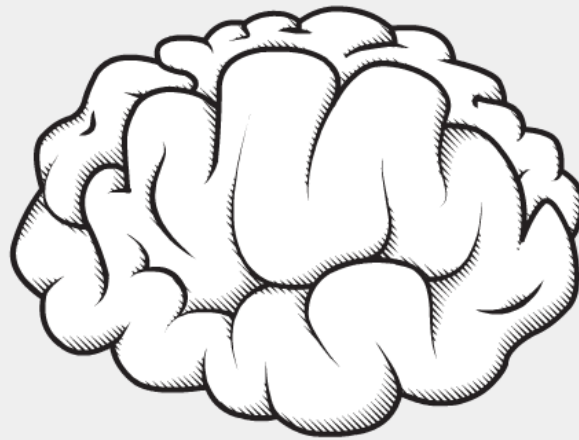
- Which section would you use to quickly get an idea about the "big picture"?



- What would be your strategy for speed reading a large volume of scientific papers?



# **Critical Analysis of scientific papers**



**The art of scientific  
skepticism**

- Is th
- Is th

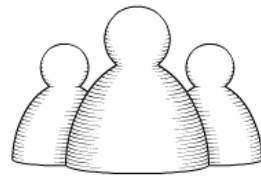
- D
- hy
- h

# ***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

THE JOURNAL OF CHILD  
PSYCHOLOGY AND PSYCHIATRY

ACAMH THE ASSOCIATION FOR  
CHILD AND ADOLESCENT  
MENTAL HEALTH

*Journal of Child Psychology and Psychiatry* \*\*:\* (2016), pp \*\*-\*\*

doi:10.1111/jcpp.12565

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

**Adrian Raine,<sup>1</sup> Rose A. Cheney,<sup>2</sup> Ringo Ho,<sup>3</sup> Jill Portnoy,<sup>4</sup> Jianghong Liu,<sup>5</sup> Liana Soyfer,<sup>4</sup> Joseph Hibbeln,<sup>6</sup> and Therese S. Richmond<sup>5</sup>**

<sup>1</sup>Departments of Criminology, Psychiatry, and Psychology, University of Pennsylvania, Philadelphia, PA; <sup>2</sup>Department of Surgery, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA; <sup>3</sup>Division of Psychology, Nanyang Technological University, Singapore City, Singapore; <sup>4</sup>Department of Criminology, University of Pennsylvania, Philadelphia, PA; <sup>5</sup>School of Nursing, University of Pennsylvania, Philadelphia, PA; <sup>6</sup>Section on Nutritional Neuroscience, National Institute on Alcohol Abuse and Alcoholism, Bethesda, MD, USA

**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**



# Discussion





CBR

# Critical Analysis of Scientific Information

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**Conway Lab**