# SMARTER SEARCHES: ADVANCED PUBMED TIPS FOR RESEARCHERS

Diana Louden, Translational Research Librarian,
UW Health Sciences Library

2.2 Billion PubMed Searches in FY2012

- 22% increase in worldwide use of PubMed from FY 2011 to FY 2012.

- How many of those searches were yours?

- How many yielded the perfect article at the top of the page?

Savvier Searches:
Making PubMed Work for You

- Common Questions & Points of Confusion

- Tips, Explanations, & Work-Arounds

- Goal: Equip You With Tools to be a More Effective Searcher. Find What You Need Faster.
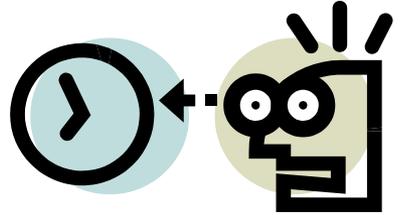
- 15-Minute Rule *(If you can't find what you need after 15 minutes of searching, contact your librarian!)*

Your Librarian Can Provide One-On-One Research Assistance

http://libguides.hsl.washington.edu/liaisons

Why did I only find two articles by Paul O. Sheppard in PubMed? I know he wrote more than that.

Pitfall #1

PubMed ▼ | sheppard paul o

📶 RSS   Save search   Advanced

Display Settings: ☑ Summary, Sorted by Recently Added   Send to: ☑

Results: 2

1. ☐ The role of genomic data in the discovery, annotation and evolutionary interpretation of the interferon-lambda family.
Fox BA, Sheppard PO, O'Hara PJ.
PLoS One. 2009;4(3):e4933. doi: 10.1371/journal.pone.0004933. Epub 2009 Mar 20.
PMID: 19300512 [PubMed - indexed for MEDLINE]   Free PMC Article
Related citations

2. ☐ A glycoprotein hormone expressed in corticotrophs exhibits unique binding properties on thyroid-stimulating hormone receptor.
Okada SL, Ellsworth JL, Durnam DM, Haugen HS, Holloway JL, Kelley ML, Lewis KE, Ren H, Sheppard PO, Storey HM, Waggie KS, Wolf AC, Yao LY, Webster PJ.
Mol Endocrinol. 2006 Feb;20(2):414-25. Epub 2005 Oct 6.
PMID: 16210345 [PubMed - indexed for MEDLINE]   Free Article
Related citations

Author Searching: Greatest accurate retrieval by using last name and initials

Tip #1

PubMed ▾ sheppard po
RSS   Save search   Advanced

Display Settings: ☑ Summary, 50 per page, Sorted by Recently Added   Send to: ☑

Results: 17

1. The role of genomic data in the discovery, annotation and evolutionary interpretation of the interferon-lambda family.
Fox BA, Sheppard PO, O'Hara PJ.
PLoS One. 2009;4(3):e4933. doi: 10.1371/journal.pone.0004933. Epub 2009 Mar 20.
PMID: 19300512 [PubMed - indexed for MEDLINE]   Free PMC Article
Related citations

2. A glycoprotein hormone expressed in corticotrophs exhibits unique binding properties on thyroid-stimulating hormone receptor.
Okada SL, Ellsworth JL, Durnam DM, Haugen HS, Holloway JL, Kelley ML, Lewis KE, Ren H, Sheppard PO, Storey HM, Waggie KS, Wolf AC, Yao LY, Webster PJ.
Mol Endocrinol. 2006 Feb;20(2):414-25. Epub 2005 Oct 6.
PMID: 16210345 [PubMed - indexed for MEDLINE]   Free Article
Related citations

3. Cloning and characterization of a human orphan family C G-protein coupled receptor GPRC5D.
Bräuner-Osborne H, Jensen AA, Sheppard PO, Brodin B, Krogsgaard-Larsen P, O'Hara P.
Biochim Biophys Acta. 2001 Apr 16;1518(3):237-48.
PMID: 11311935 [PubMed - indexed for MEDLINE]
Related citations

4. Platelet-derived growth factor C (PDGF-C), a novel growth factor that binds to PDGF alpha and beta receptor.
Gilbertson DG, Duff ME, West JW, Kelly JD, Sheppard PO, Hofstrand PD, Gao Z, Shoemaker K, Bukowski TR, Moore M, Feldhaus AL, Humes JM, Palmer TE, Hart CE.
J Biol Chem. 2001 Jul 20;276(29):27406-14. Epub 2001 Apr 10.
PMID: 11297552 [PubMed - indexed for MEDLINE]   Free Article
Related citations

Searching for an Author's Full Name Only Works for Recent Articles

Explanation

- Looks are deceiving.

- Ability to search with an author's full name was enabled starting in 2002, but was not retroactive.

- For the most thorough results, search for the author's last name plus initials (no punctuation)

- Using the field tag [au] is optional
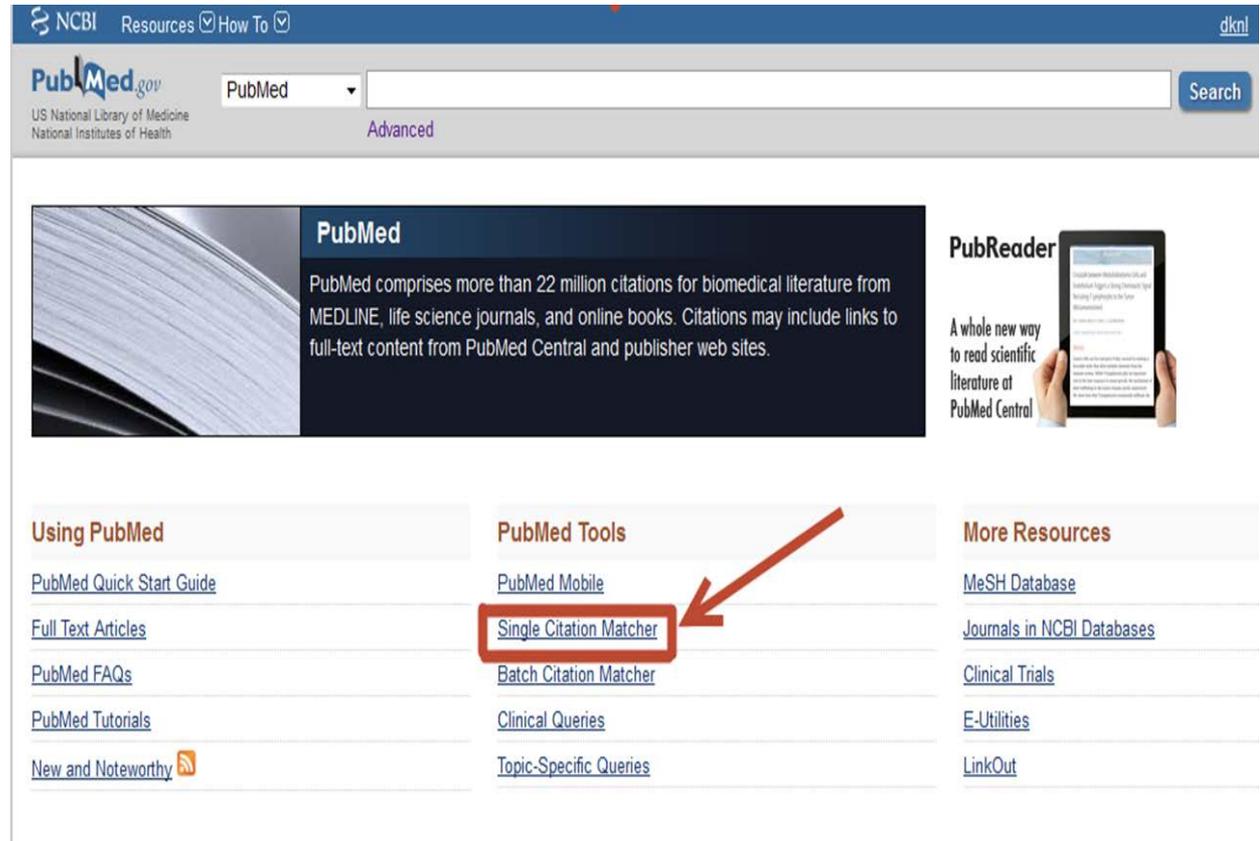
- Example: **Sheppard PO**

I wanted to find a specific article, not every article on a topic.

Pitfall #2

- I read a news article reporting on a new analysis of the correlation between hormone replacement therapy and breast cancer. The news article only gave the journal name and the lead investigator's name.

- How can I find this specific article and not every article about HRT and breast cancer?

- A PubMed search for "breast cancer hormone replacement therapy" turns up over 4,000 references.

Use Single Citation Matcher
to Find a Specific Known Article

Tip #2

Fill in Just the Fields You're Sure Of

Explanation

PubMed Single Citation Matcher

Use this tool to find PubMed citations. You may omit any field.

| Journal · Help | Journal of the National Cancer Institute |
| Date | 2013 (month and day are optional) |

| Details | Volume | Issue | First page |

| Author name · Help | Chlebowski R |

Limit authors ☐ Only as first author ☐ Only as last author

Title words

Search   Clear form

Easily spot the article you're looking for and follow the link to the full text.

Display Settings: ⊙ Abstract

Send to: ⊙

ADVANCE ACCESS OXFORD JOURNALS | Check for Full Text W

Estrogen Plus Progestin and Breast Cancer Incidence and Mortality in the Women's Health Initiative Observational Study.

Chlebowski RT, Manson JE, Anderson GL, Cauley JA, Aragaki AK, Stefanick ML, Lane DS, Johnson KC, Wactawski-Wende J, Chen C, Qi L, Yasmeen S, Newcomb PA, Prentice RL.

Save items

☆ Add to Favorites ▾

ARTICLE |

Estrogen Plus Progestin and Breast Cancer Incidence and Mortality in the Women's Health Initiative Observational Study

Rowan T. Chlebowski, JoAnn E. Manson, Garnet L. Anderson, Jane A. Cauley, Aaron K. Aragaki, Marcia L. Stefanick, Dorothy S. Lane, Karen C. Johnson, Jean Wactawski-Wende, Chu Chen, Lihong Qi, Shagufta Yasmeen, Polly A. Newcomb, Ross L. Prentice

Correspondence to: Rowan T. Chlebowski, MD, PhD, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, 1124W Carson St, Torrance, CA, 90502 (e-mail: rowanchlebowski@gmail.com).

Background   In the Women's Health Initiative (WHI) randomized trial, estrogen plus progestin increased both breast cancer incidence and mortality. In contrast, most observational studies associate estrogen plus progestin with favorable prognosis breast cancers. To address differences, a cohort of WHI observational study participants with characteristics similar to the WHI clinical trial was studied.

There are So Many Links on the PubMed Screen.
I Just Ignore All of Them.

Pitfall #3

Train Yourself to Focus on Key Sections

Tip #3

□ **Filters**: useful, common ways to narrow your search

Tip #3
continued

□ **<u>Search details</u>** lets you see how PubMed interpreted your search. Helps you select MeSH terms or see what to change.

Search details

il28b[All Fields] AND
("polymorphism, genetic"[MeSH
Terms] OR ("polymorphism"[All
Fields] AND "genetic"[All
Fields]) OR "genetic
polymorphism"[All Fields] OR

Search   See more...

Tip #3
continued

☐ **<u>Find related data</u>** connects you to pertinent records in NCBI scientific databases.
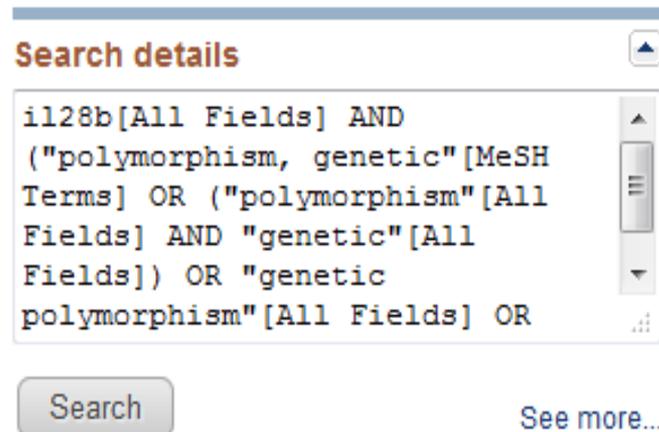
My PubMed Search Screen Doesn't Look Like Yours

Pitfall #4

☐ **Libraries can customize PubMed** to link to their electronic journal subscriptions. You can make best use of your full-text journal access by specifying your library in your My NCBI account.

☐ **Individuals can also customize PubMed within My NCBI** to make it more useful. This includes modifying your search interface and filters.

Set Up a My NCBI Account and Customize Your Filters

Tip #4

Set up a My NCBI Account.

Customize your filters and site preferences.

Specify your library.

Sign in when you search.

[Sign in to NCBI]

http://libguides.hsl.washington.edu/myncbi

Key Benefit of Customizing Filters:
Easier Access to Full-Text Journal Articles

Everyone can use the "free full text available" filter on the left side of the screen.

****

Articles can also be ordered through your library's document delivery service.

- Consider limiting your search to articles available immediately through your library's electronic subscriptions.

Filter your results:
- All (613)
- Clinical Trial (52)
- English (590)
- Humans (473)
- Links to Gene (204)
- Published in the last 2 years (487)
- Review (90)
- University of Washington Online (493)

- When viewing a PubMed abstract, look for your library's full-text icon (if there's no free full text icon).

ADVANCE ACCESS OXFORD JOURNALS   UW ARTICLE ONLINE

Check for Full Text W

- <u>Note to UW users</u>: If the publisher's full-text link prompts you to log in or pay, and if there is no purple "UW Article Online" icon, **always click on the purple & gold "Check for Full Text" icon.** Many UW subscriptions can only be accessed this way.

I Must Have Done Something Wrong. A Completely Irrelevant Article is at the Top of my Search Results.

Pitfall #5

☐ **Google** would have known what I meant!

GOOGLE AND PUBMED: DIFFERENT MINDSETS

Google: Essential Facts

- <u>Content</u>: The endless internet, its metadata, & other "mineable" elements as read by search algorithms.

- <u>Creator</u>: Commercial institution

- <u>Search Tips</u>: Get good results with natural language queries.

- <u>Transparency</u>: Intentional black box

- <u>Search Results</u>: Ranked by relevance based on keywords, what's popular, how many reputable sites link to it, and what you've looked at before.

PubMed: Essential Facts

- <u>Content</u>: Traditional journal article database (over 5,000 journals back to 1940s) indexed by humans

- <u>Creator</u>: US Government institution

- <u>Search Tips</u>: Improve results by using defined search fields, recommended search terminology, & help screens

- <u>Transparency</u>: "Search Details" box explains how your search was interpreted.

- <u>Search Results</u>: **ALL** results match your search criteria. Most recent references listed first.

Tip #5: Adopt Different Mindsets for Different Search Interfaces

Google

- Results organized with most relevant items listed first
- Optimized to connect you to the "top" references.
- Nobody looks at "all" references. Everything is shades of gray – ever-decreasing grades of relevance.

PubMed

- PubMed results: organized with most recent items listed first.
- Designed to retrieve ALL references that meet search criteria.
- PubMed offers some auxiliary search approaches that involve relevance ranking.

A Multi-Step Strategy Works Best in PubMed, But There Are Google-Like Approaches

Tip #5b

Google-like approaches in PubMed include looking at "Titles with your search terms" to find a few relevant references.

Follow the "Related Citations" Link for a Set of Relevance-Ranked References

Tip #5c – another "Google like" approach:

1. Identify a useful reference.

2. "Related Citations in PubMed" will connect you to a list of about 100 references on the same topic. (Click on "See all.")

I Just Wanted a Few Good References, Not Thousands

Pitfall #6

PubMed ▼ patient cells tumor xenograft model

RSS   Save search   Advanced

Display Settings: ☑ Summary, 50 per page, Sorted by Recently Added

Send to: ☑

Results: 1 to 50 of 3075

<< First   < Prev   Page 1   of 62   Next >   Last >>

☐ Pharmacokinetic characterization of CK2 inhibitor CX-4945.
1. Son YH, Song JS, Kim SH, Kim J.
Arch Pharm Res. 2013 Mar 31. [Epub ahead of print]
PMID: 23543629 [PubMed - as supplied by publisher]
Related citations

☐ β-catenin/POU5F1/SOX2 transcription factor complex mediates IGF-1 receptor signaling and predicts
2. poor prognosis in lung adenocarcinoma.
Xu C, Xie D, Yu SC, Yang XJ, He LR, Yang J, Ping YF, Wang B, Yang L, Xu SL, Cui W, Wang QL, Fu
WJ, Liu Q, Qian C, Cui YH, Rich JN, Kung HF, Zhang X, Bian XW.
Cancer Res. 2013 Mar 28. [Epub ahead of print]
PMID: 23539445 [PubMed - as supplied by publisher]
Related citations

Steps for Building a Search Strategy Using MeSH Terms (Medical Subject Headings)

Tip #6

Get in the PubMed Mindset.

Use a multi-step strategy to conduct a thorough search and retrieve highly relevant references.

1. Try to identify 1-3 relevant references.
   a. Dream up a perfect title, and search for significant words from your dream title.
   b. Search for specific phrases using quotation marks.
2. Select MeSH terms that have been applied to the best references.
3. Build a strategy using a combination of MeSH terms, individual words, or phrases.
4. Apply filters such as a publication type, a patient population, a date range, or a language.

Find a couple of relevant references.
These are your pearls.

- We're looking for the use of patient-derived cells in a tumor xenograft animal model.
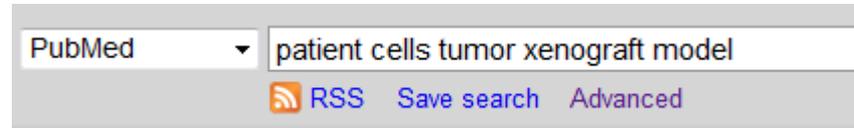
PubMed ▾	patient cells tumor xenograft model
🔶 RSS Save search Advanced	

- Our original search yielded 3,075 references. References weren't on target.

- Now we try a more specific search strategy requiring that the phrase "patient derived" appear in the title or abstract.
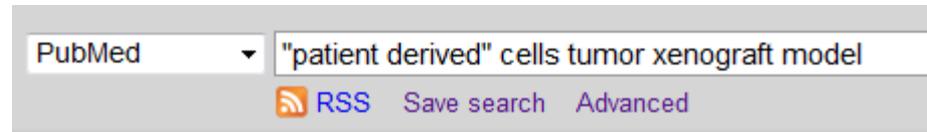
PubMed ▾	"patient derived" cells tumor xenograft model
🔶 RSS Save search Advanced	

- Searching for a specific phrase narrowed our search to 103 references, and they're more relevant.

Determine the Best MeSH Terms to Add to Your Search. Combine MeSH Terms With Other Words or Phrases.

Steps #2-3:

Select MeSH terms.

Add them to your search.

Include additional non-MeSH terms as needed.

Xenograft Model Antitumor Assays[MeSH Terms] AND Pancreatic Neoplasms[MeSH Terms] AND "patient derived"

Step #4: Apply Filters If Appropriate

Xenograft Model Antitumor Assays[MeSH Terms] AND Pancreatic Neoplasms[MeSH Terms] AND "patient derived"

My Search Strategies Build on Each Other, So I Wade Through the Same References Over and Over.

Pitfall #7

Here's my previous search strategy:

Xenograft Model Antitumor Assays[MeSH Terms]) AND Pancreatic Neoplasms[MeSH Terms] AND "patient derived"

Now I want to conduct this search:

Pancreatic Neoplasms[MeSH Terms] AND "patient derived"

But I don't want to see the references I've already looked at. (The first set of references would be a subset of my new search.)

Use Advanced Search Builder to Combine Searches or Exclude Previous Searches

Tip #7

Click on "Advanced" to see your recent searches.

Repeat, modify, build on, or exclude previous search results.

I Checked PubMed, and Nobody Has Ever Done What I'm Planning To Do

Pitfall #8

Try Multiple Search Strategies Before Drawing Your Conclusion

Tip #8a

Try multiple search strategies before drawing your conclusion.

- We're looking for clinical trials studying inhibitors of the quorum sensing mechanism (bacterial cell-to-cell communication) in *Pseudomonas*. Limiting our search to clinical trial reports yielded zero references.

- Is it really true that nobody has undertaken a clinical trial to specifically study drugs interfering with "quorum sensing" in *Pseudomonas*?

Try Another Search Strategy Using MeSH Terms and Subheadings

Tip #8a, continued:

Look up terms in the MeSH database.

Use subheadings to focus on a particular aspect of a topic.

☐ By choosing the "Quorum Sensing" MeSH term and the "drug effects" subheading, we'll limit our search to articles that discuss the effects of any drugs on quorum sensing.

Slightly modifying the search yielded three references we didn't find the first time.

Explanation:

We didn't require the specific word "inhibitors."

Instead, we used a subheading that encompassed the concept of inhibition, as well as other related topics.

You May Need to Search Multiple Databases

Tip #8b:

Try other reputable databases appropriate for your topic.

ClinicalTrials.gov

Try Multiple Searches and Multiple Databases. Contact a Librarian for Assistance

Remember:

PubMed does not contain ALL biomedical literature.

PubMed does not contain conference publications.

What you are looking for may not be in a journal article.

I Don't Have Time to Go Through All of These References Right Now

Pitfall #9

- Since you've done the work to build a good search strategy, you don't want to lose it.

- PubMed will save your work for 8 hours, but to be on the safe side, save your references in a "collection."

- If you're working with a group, consider sharing your search results with your colleagues using EndNote, Mendeley, or another citation manager.

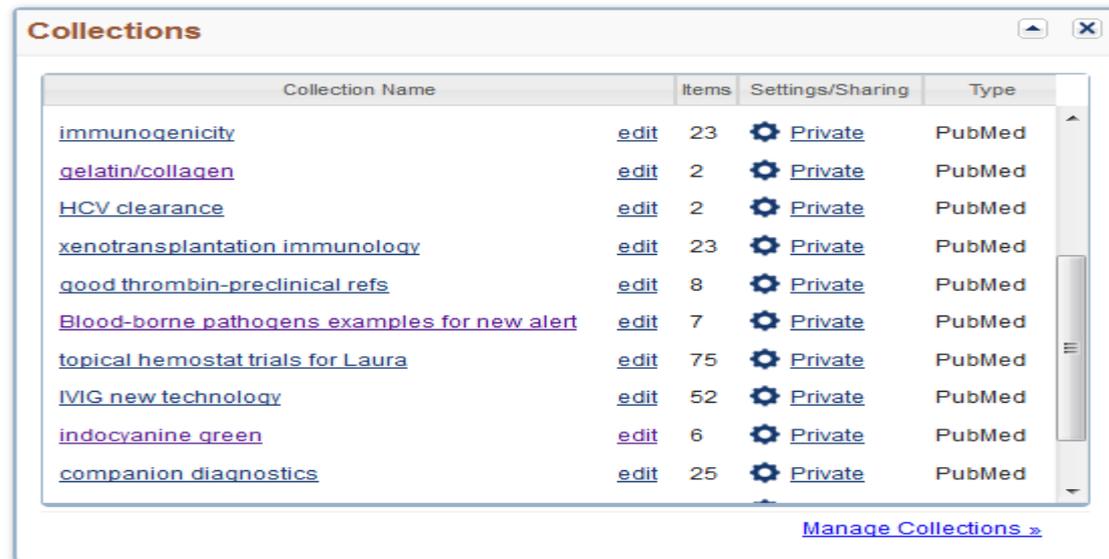# Use ![My NCBI] to Track Your Searches and Save Your References in Collections

☐ Collections can be held indefinitely, modified, or discarded.

☐ Using collections lets you take advantage of links to full-text articles and to other NCBI databases.
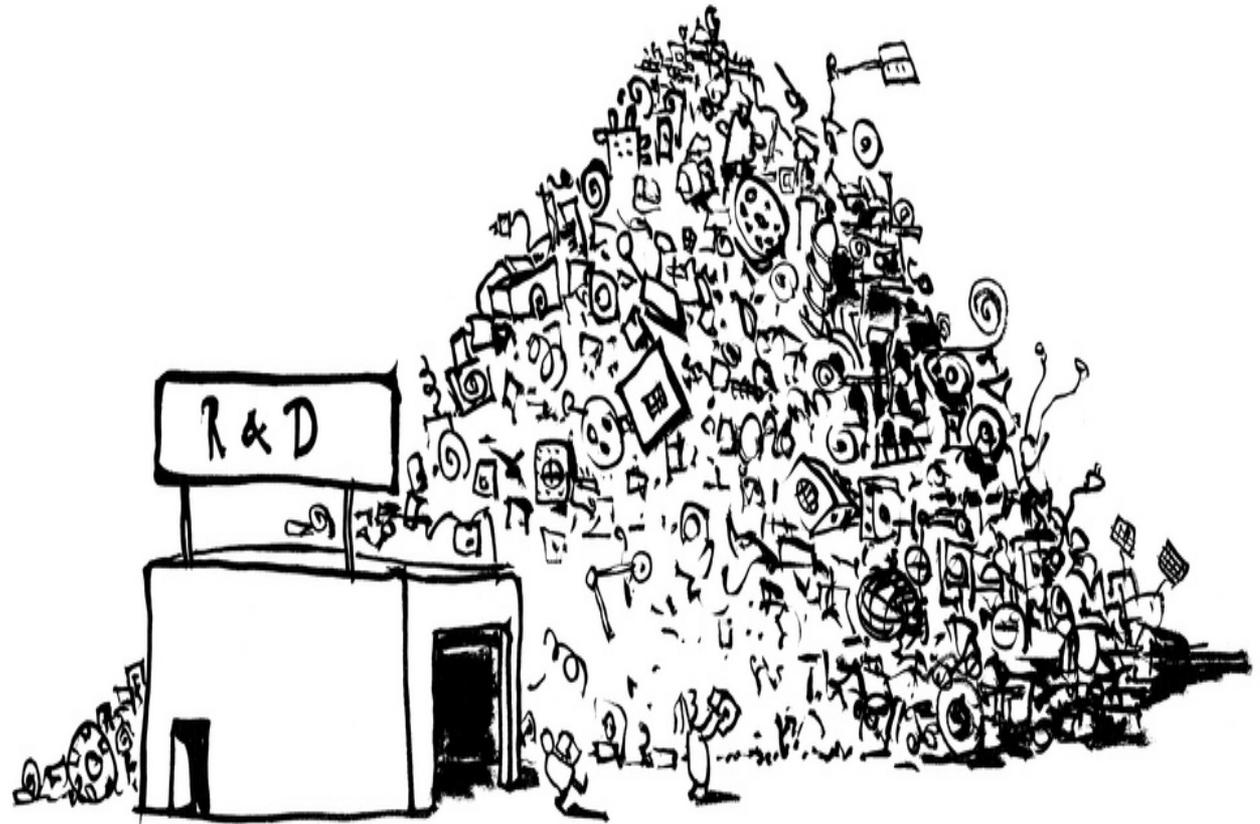

Collections

Collection Name		Items	Settings/Sharing	Type
immunogenicity	edit	23	⚙ Private	PubMed
gelatin/collagen	edit	2	⚙ Private	PubMed
HCV clearance	edit	2	⚙ Private	PubMed
xenotransplantation immunology	edit	23	⚙ Private	PubMed
good thrombin-preclinical refs	edit	8	⚙ Private	PubMed
Blood-borne pathogens examples for new alert	edit	7	⚙ Private	PubMed
topical hemostat trials for Laura	edit	75	⚙ Private	PubMed
IVIG new technology	edit	52	⚙ Private	PubMed
indocyanine green	edit	6	⚙ Private	PubMed
companion diagnostics	edit	25	⚙ Private	PubMed

Manage Collections »

Use a Citation Manager Such as EndNote or Mendeley to Save and Share Your Work

Tip #9b

Use a citation manager to:

1) Save useful references & associated PDF files.

2) Share references with colleagues.

3) Easily cite references when writing in Word.

I'd like to keep up with the literature in my field, but it's too overwhelming.

Pitfall #10

Determine a Reasonable Scope;
Set up a Current Awareness Alert

Tip #10

Automated alerts are an essential tool for keeping up with the literature.

Consider multiple current awareness alerts – each one focused on a different topic.

Automatically Receive New References Added to PubMed That Match Your Search Criteria

Receive updates by email or RSS Feeds.

Contact Diana Louden (UW) or your local librarian for assistance.

☐ Contact your librarian for assistance with:

- ☐ Choosing a database
- ☐ Creating & refining the search strategy
- ☐ Retrieving a manageable number of references each week

Thank you for your interest.

Diana Louden

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