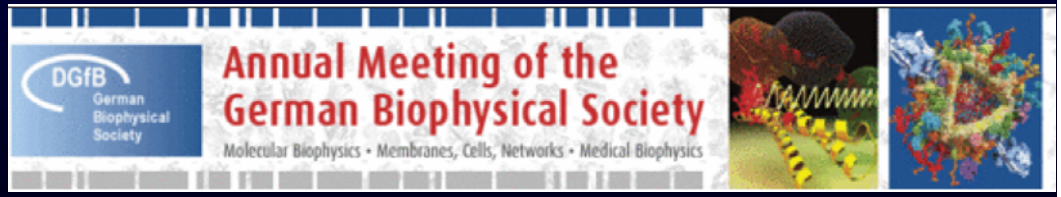
Scientific writing & Literature Searches

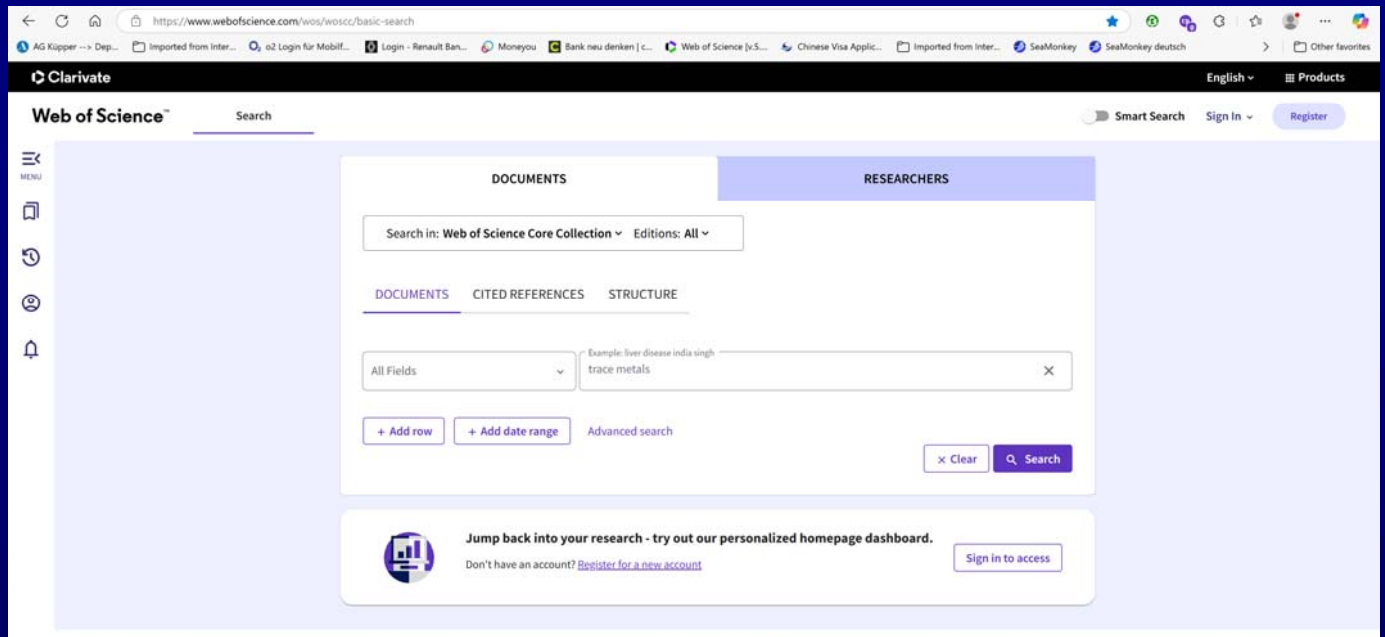


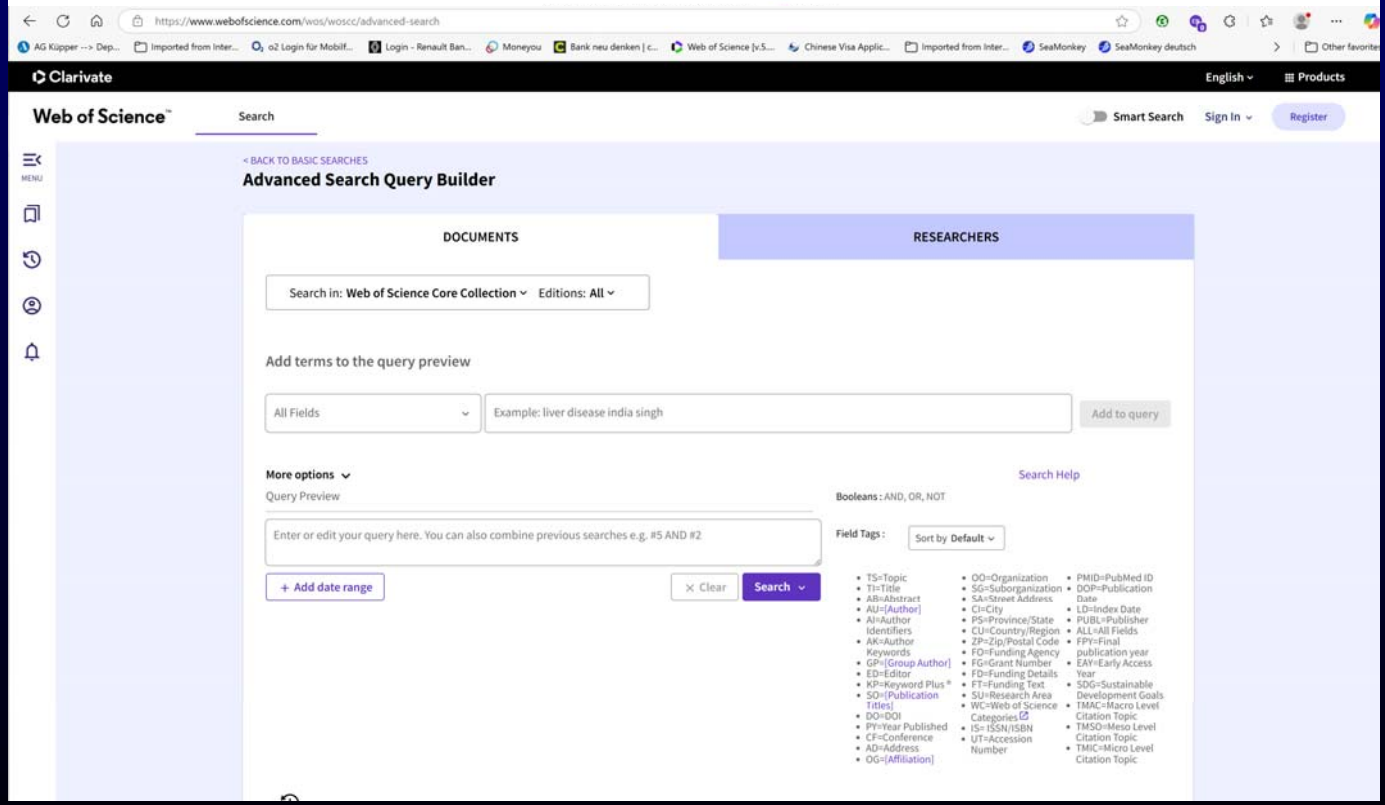
How to compare your results with previous studies...

• Commercial scientific databases like Web of Science or Scopus *(→ show online)*
→ Most comprehensive
→ including various tools for narrowing your search to a reasonable number of results while getting all articles you need, use of boolean operators allows good search terms
→ include links for download of the article with different possibilities offered by your institution/university (direct download, ordering in different ways)
→ BUT: not available everywhere (only via institutional subscription, i.e. probably no use at your home depending on your remote access to you institute/University)
→ **USEFUL FOR DETAILED COMPREHENSIVE SEARCHES**

How to compare your results with previous studies...

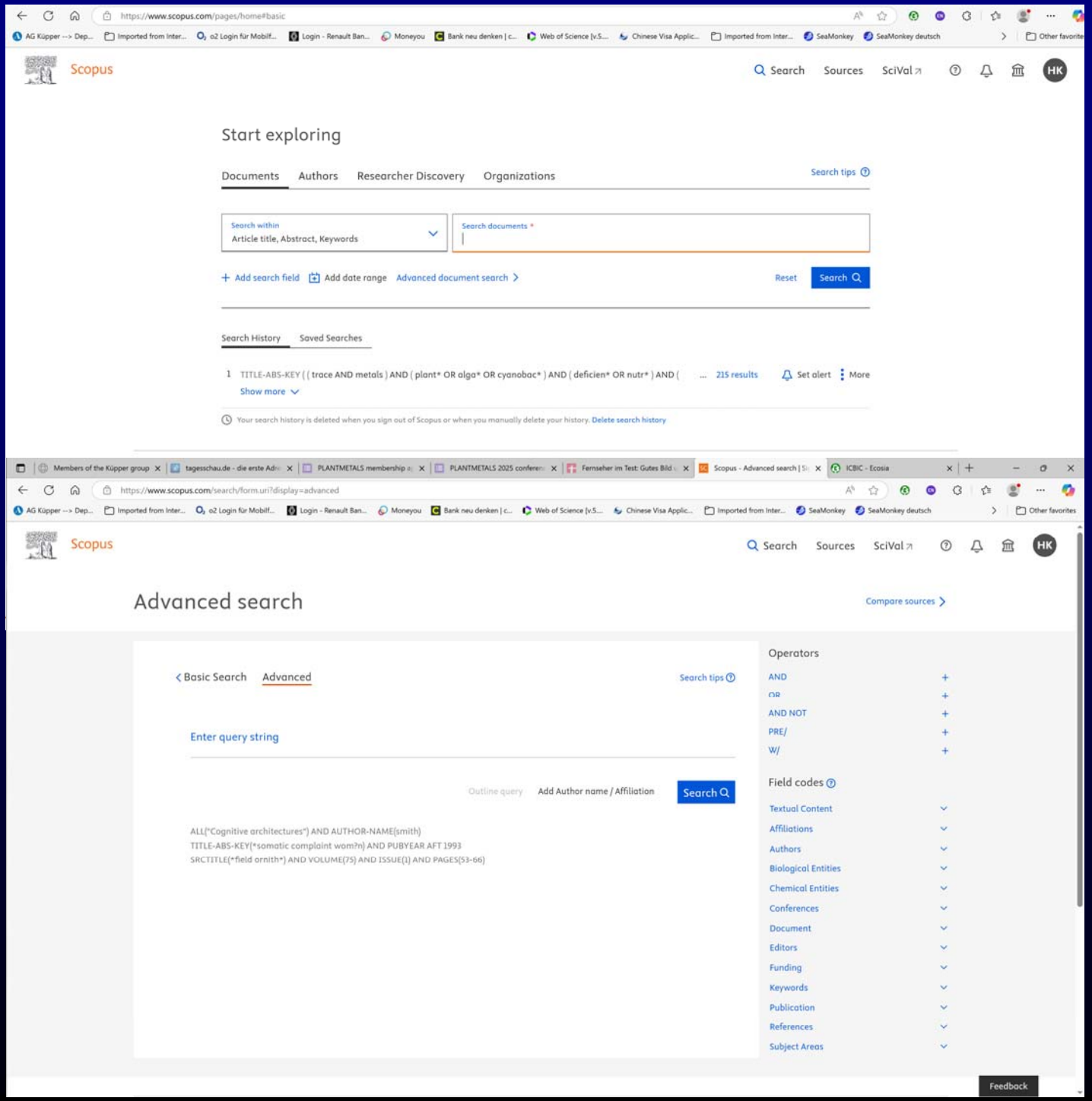
- basic vs. advanced search in Web of Science





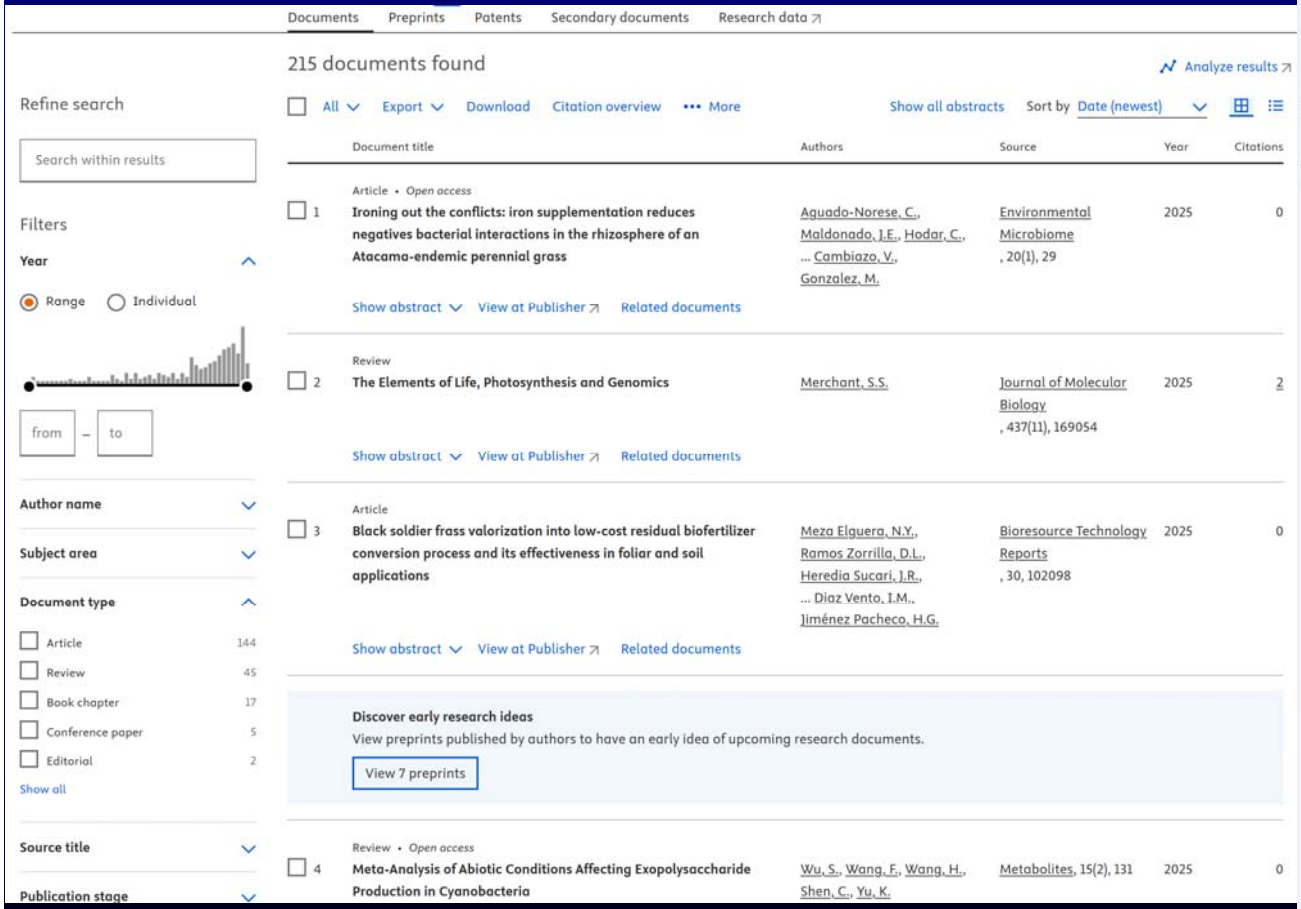
How to compare your results with previous studies...

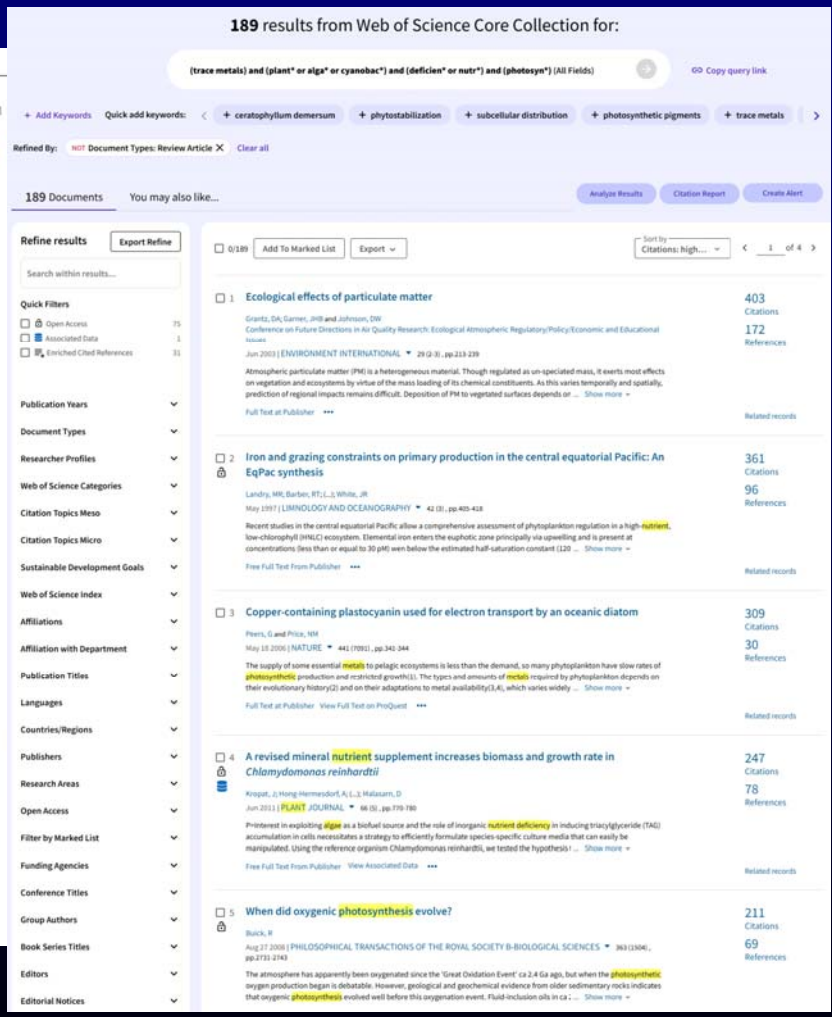
- basic vs. advanced search in Scopus



How to compare your results with previous studies...

- Outcome of an example of an advanced search in Scopus vs. Web of Science





How to compare your results with previous studies...

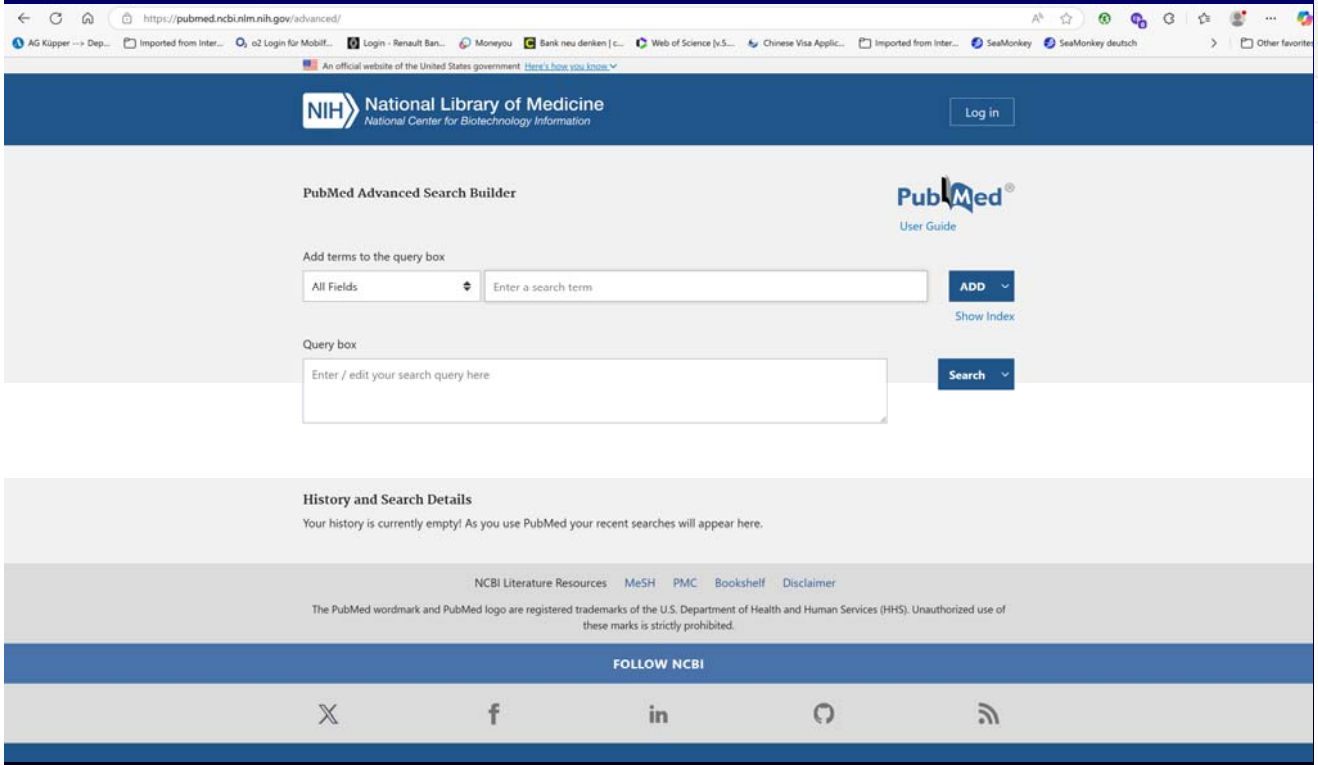
- Free scientific databases like medline/pubmed *(→ show online)*

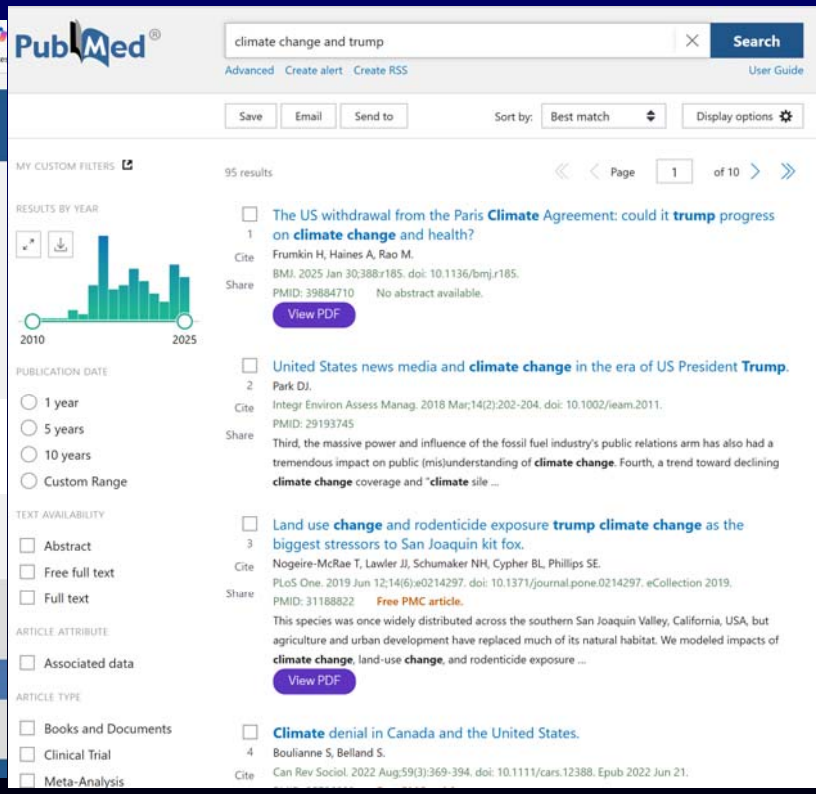
→ available everywhere, only require internet access

→ usually fast and user-friendly

→ Not as complete as above, less options for your search

→ **Useful for retrieving articles you found e.g. cited in other articles, and for "quick" searches without need for completeness**





How to compare your results with previous studies...

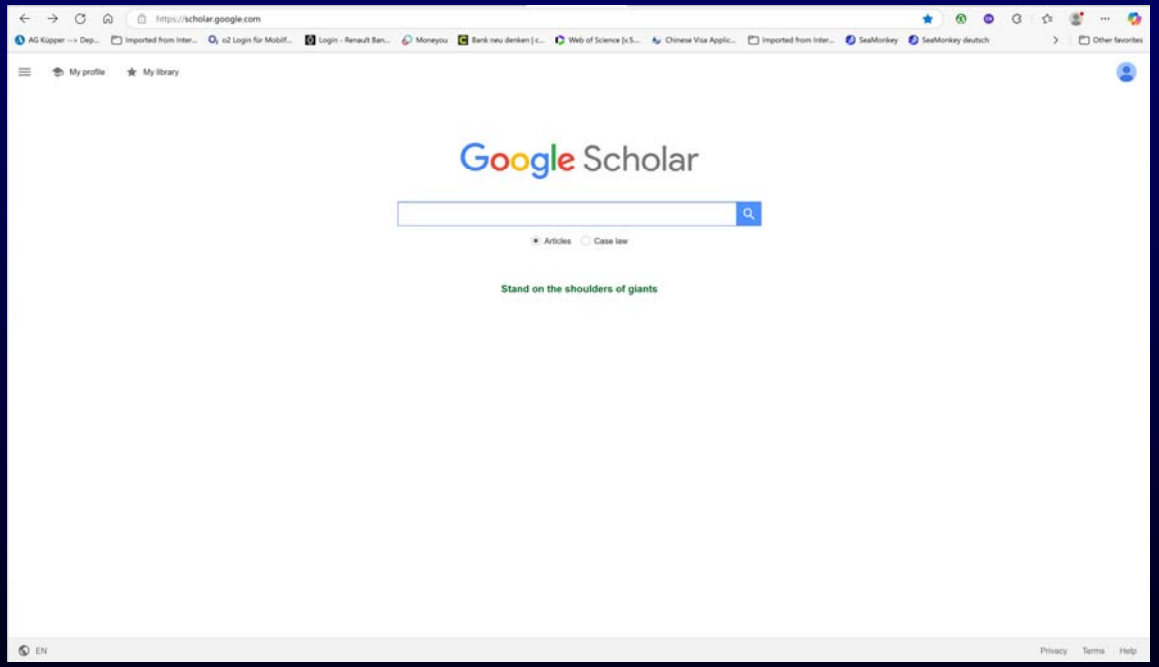
•Advertisement-based “free” commercial search engines like Google (incl. "Advanced Google Scholar search)

→ like free scientific databases except for:

→ in Google, search results are ordered also by advertisement revenue to Google

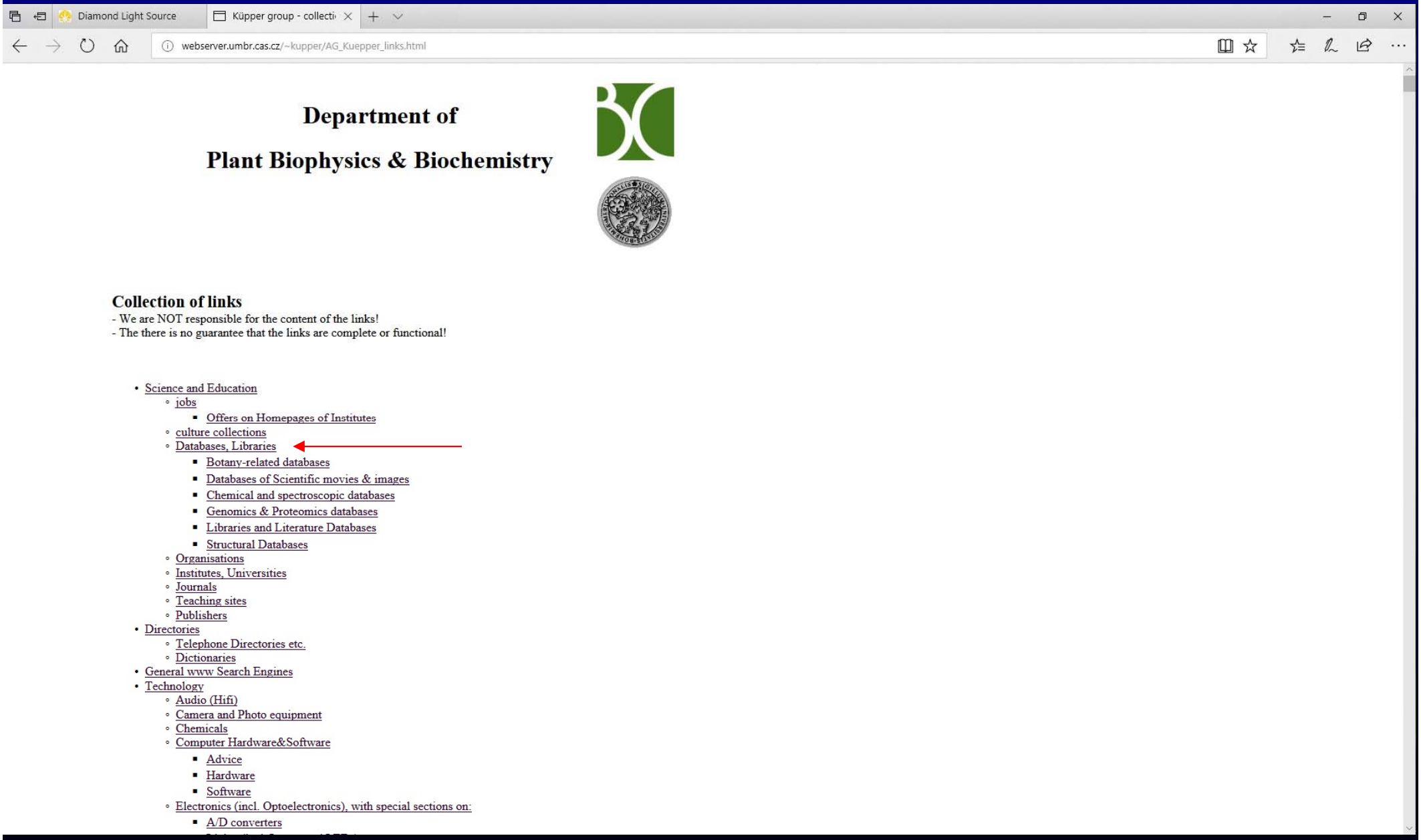
→ in "Google Scholar" no boolean operators → complex search terms impossible

→ **useful for a really quick search that does NOT need to be comprehensive, useful for finding images for teaching etc., useful for looking for institute addresses, etc.**



Searches for specialised scientific data

You will find links to various specialised databases e.g. on our group homepage



Literature searches (I)

Think of a search term and test it. It should be comprehensive enough to cover all the subject area you want to learn about, but specific enough that you can still read at least all titles of the articles retrieved by your search (i.e. max. hundreds, not thousands of results) *(→ examples)*

Start screening your results by reading the titles. If the title looks interesting, read the abstract. If that shows it is an important paper for your work, read it in detail. In that latter case, don't forget to critically think about the methods applied, often you will find some flaws that render some results questionable

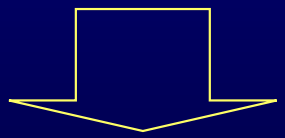
or:

If you absolutely don't find a search term specific but comprehensive enough to end up with a reasonable number of papers, narrow down your search to a few new articles (last 2-3 years), PLUS some authoritative comprehensive reviews PLUS highly cited original articles. This selection will then lead you to further relevant papers. And it is likely that authors from the latter two categories will be among your referees when you submit your paper.

Literature searches (II)

Save the articles you could retrieve in a way that you will find them again later, even after downloading hundreds more publications.

- For this, a filename should contain (in a consistent order) at least the family name and initials of the first author, the publication year, abbreviated journal title, issue and page numbers.
- A drastically shortened version of the title could also help, but full titles are amost always too long (remember: max. file name length is 256 characters, but this includes the whole file path!) *(→ examples)*



Once you have a lot of articles, make a systematic database on your computer out of them, in a way that requires least time needed for the purpose of finding articles later (usually does not require special software).

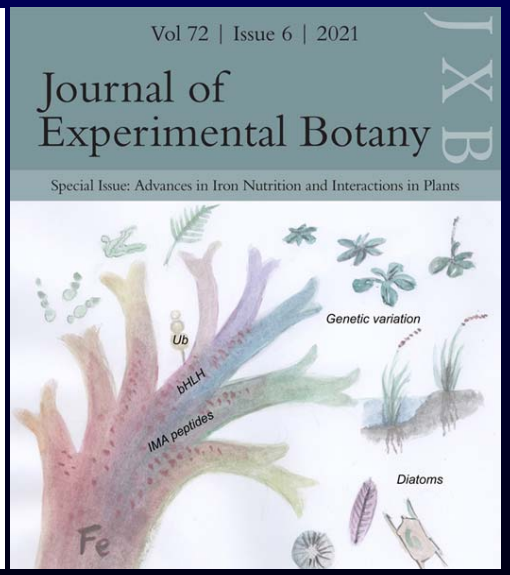
… and how to publish them

… in scientific journals

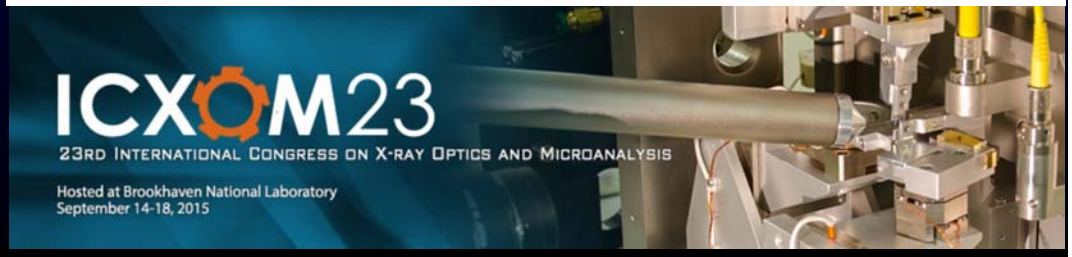
New Phytologist

analytical chemistry

Plant, Cell & Environment



… and as conference presentations



Where should you publish?

- **Conferences**

→ Useful for meeting with your colleagues – but this usually only works well with REAL, physical, not online conferences

→ Useful for learning about the latest, often not published results – but be aware tha often researchers are (rightfully) afraid of showing the most exciting unpublished results because of competition

→ **Be aware of fraudulent, predatory conferences – often fraudulent conferences exist under the same name as famous real conferences → check carefully!**

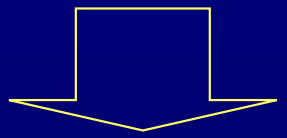
- **Scientific journals**

→ usually the final place where you want to publish the knowledge you gained with your research, to make it useful for the whole scientific community

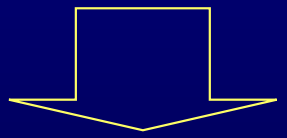
→ factors to be considered for the choice of a journal: match with your scientific field, requirements for publication, scientific reputation **(be aware of predatory journals!)**

Scientific writing (I)

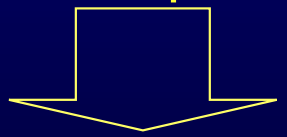
Write the "Methods" section, as unformatted plain text, already during data acquisition, because then you remember possibly important small details best



Sort your data, make preliminary graphs of each dataset, print those graphs



Try to explain the graphs to a colleague, and arrange them in a way that turns out to make sense in terms of presenting a consistent story



Decide to which journal you initially want to submit the manuscript, and start writing the text of the manuscript based on a template that is suitable for that journal

If you don't have template, create one, don't just format on a single-paragraph basis as this will lead to formatting chaos and will cost a lot more time later!

Scientific writing (II)

Write the "Results" section of your manuscript, with strongest focus on your strongest data

Write the Discussion and Abstract of your manuscript, focussing on the most important results

Only now write the Introduction, in a way that clearly but ONLY introduces facts and methods that are important in view of your own results and methods

Assemble the draft graphs into figures, and optimise the layout of the figures

Send the paper to your colleagues for discussion

SUBMIT

To advance in SCIENCE and ARTS,
YOU need a good EDUCATION,
YOU must have IDEAS, even some crazy ones,
however, 95-98% will be HARD WORK...

All slides of my lectures can be downloaded from my workgroup homepage

Biology Centre CAS → Institute of Plant Molecular Biology → Departments → Department of Plant Biophysics and Biochemistry,

or directly

http://webserver.umbr.cas.cz/~kupper/AG_Kuepper_Homepage.html