Module 7.1: Learn - Biology

7.1 Biology/Statistics

Contextualize Results

Now that you have completed the planned research for the course and written up your results, we would like to start thinking about how our results fit in with published findings. This will be how we will write the Introduction and Discussion sections of the final manuscript for this study.

When contextualizing the results we have to consider:

- **How do our results fit with results of other published studies on the same topic?** In our case, what other studies have been published with the CCLE and how might those be affected by the results we have generated?
- **What is the broader significance of our results?** In our case, what might our findings mean for results from labs that used cell lines in CCLE without considering the sex chromosome complement in those cells?

To answer these questions, we have to do a literature search. We have described ways to Google search coding solutions and other relevant information in previous modules, but here we are trying to contextualize results in the broader context of what has been done in previous studies. You want to identify key studies that are relevant to your findings and figure out whether your results are consistent (or not) and then state how these ideas are related.

Literature Search Strategy

Since it is super easy to go down rabbit holes, you will want to spend a few minutes devising a strategy for finding information to contextualize your results. They key points to a good search strategy are:

- **Defining your Keywords.** Think about your results in terms of simple concepts that you can search for– t gene(s) that we used to predict genetic sex (or the class of them such as gametologs), the name of the da and use Boolean operators like AND and OR to put the terms together in a logical way.
- **Setting limits (ie: date of publication, language).** It might be beneficial to limit the results to narrow dow such as limiting to those published in the last 5 or 10 years. If you look at the introduction section of recer back and look at older publications it references if it sounds relevant.
- **Recording your finds.** It is very helpful to use a citation manager as we have discussed in previous modu loading citations for papers you are interested in, it is good practice to take notes on papers of interest. Tl keep track of what ideas came from when you are ready to write up your results.

Pubmed

A key resource when doing scientific literature review is **Pubmed** (https://pubmed.ncbi.nlm.nih.gov/) , the biom database maintained by the National Library of Medicine. It contains millions of publications and is considered th looking for scientific results.

If you go to Pubmed, you will see that there is a search box at the top to put in the keywords you decided on. Th feature to help you come up with customized searches if you need where you can specify things like what field (s or author) you want the term to be found in. The main search results can be easily filtered on how recent the pub timeline bar chart on the left. You can get a feeling for how much research has been on what you are searching f come up and the best results will be listed first. You can scroll down and get an idea of if you want to modify you relevant results. Try Pubmed out by searching for a topic of your choice relevant to the research project we are c

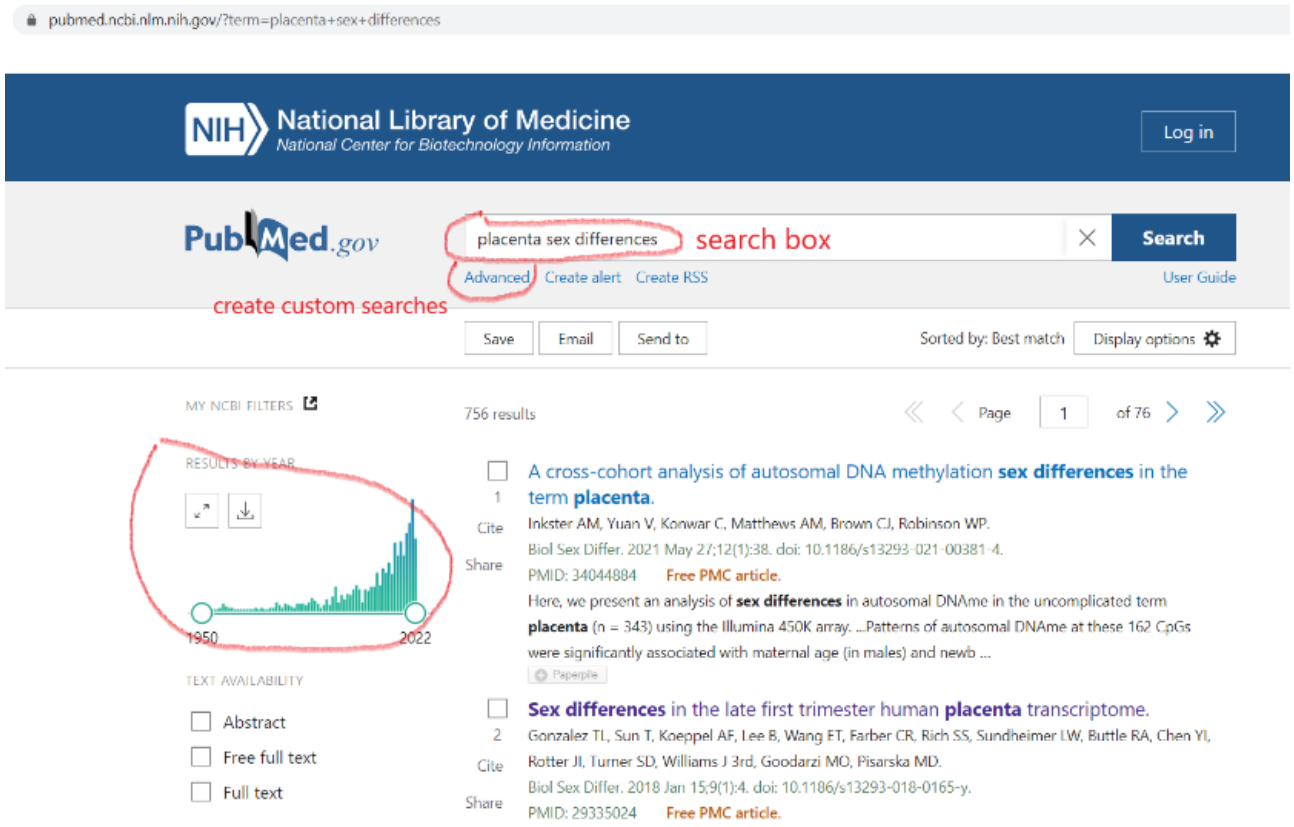

Figure: Pubmed search

If you click on the title for one of the results, you will see a summary of the paper you selected that looks like this:

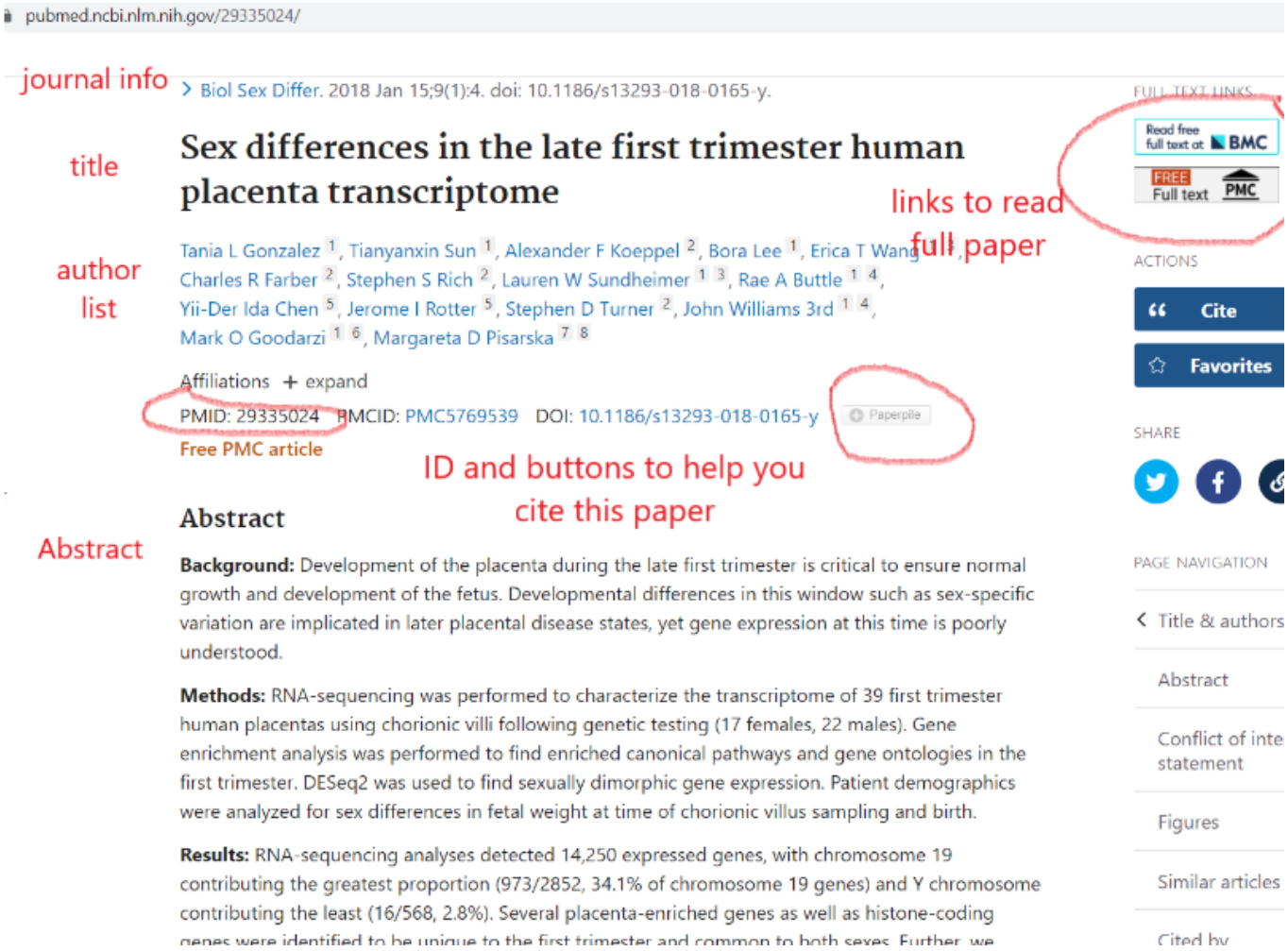

Figure: Specific search result in Pubmed

The top line summarizes the citation information, usually an issue of a scientific journal with the date of publicatio title and abstract of the publication to tell you what the key findings of the publication are. If this looks like a publi read all the way through, you can see links on the right. Be sure to be logged into the ASU network VPN becaus access at many journals. Each entry on Pubmed has an ID (PMID) which can be used for easily searching for a c publication on citation managers like Endnote, Paperpile, and Zotero. In some cases, there are buttons for autor citations that show up if you have the browser plugin for a particular citation manager, such as the Paperpile impo above.

Google Scholar

Another good tool to find resources uses the Google search engine to find articles about a topic: **https://scholar.**
(https://scholar.google.com/)

Type any topic into the search bar and you will see a list of links for articles found. There are some features to cu
on the left side, plus you can use quotes, and/or, and other search features just like you would use for regular Gc
nice part about this is that you often will see links directly to the full text of the article. Also, you can see which ot
article you are looking at by clicking on the 'Cited by' link, this can help you to find studies similar to what you are
might be especially helpful if you are searching for articles about methods of analysis and find articles that detail
that method to produce something interesting. Clicking around the results you can find information you can use t
for the article you are reading including the title and the authors, and in some cases the Pubmed ID or DOI identi
managers provide a button to directly import the article so you might see a button for importing next to the search
Scholar is generally a good tool to help you broaden your search to learn more about the topic you are studying.

Additional Resources

- Long list of guides on how to do successful literature searches
  - **Genetics & Biochemistry: Literature searching (https://libguides.swansea.ac.uk/geneticsbiochemistry**