Module 7.1: Learn - Biology

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, this
 can be other placenta differential gene expression studies or studies studying specific genes that we found
 to be differentially expressed.
- How do our results fit with other conditions other groups have tried? In our case, this can be other
 trimming software related results people have published. It can be results from different related tissues
 such as the decidua, the maternal uterine tissues that line the placenta during pregnancy, or placental sex
 differential gene expression in pregnancy complications like preeclampsia.

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—the names of the gene(s) that were differentially expressed (or the class of them if there are many that

were related such as integrins or receptor tyrosine kinases), the tissue and condition your results were in (suc pregnancy, full term), enriched pathways in your results (such as differentiation or transport)-- and use Boolea 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 down to as limiting to those published in the last 5 or 10 years. If you look at the introduction section of recent papers 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 modules loading citations for papers you are interested in, it is good practice to take notes on papers of interest. This very 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 biomedatabase maintained by the National Library of Medicine. It contains millions of publications and is considered the 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 put timeline bar chart on the left. You can get a feeling for how much research has been on what you are searching to 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.

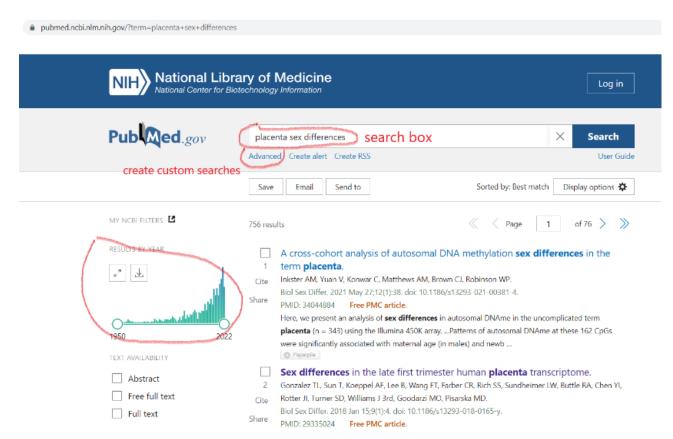
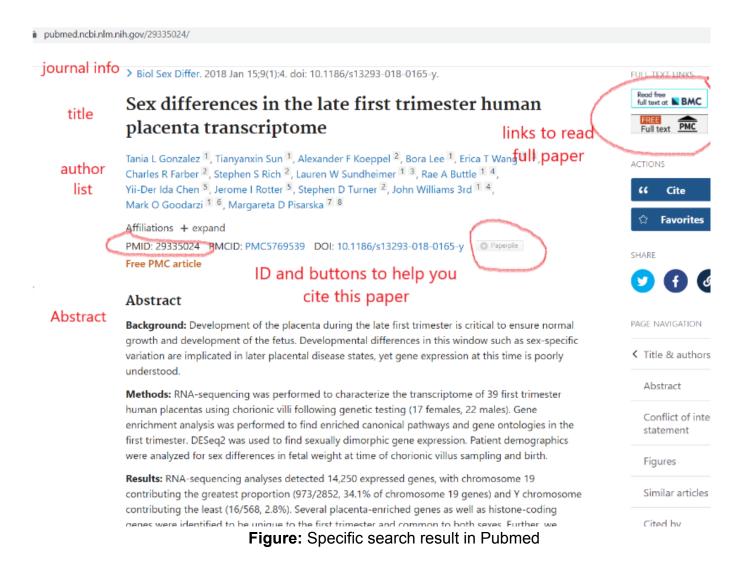


Figure: Pubmed search

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:



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 imposition.

Module 7.1 Additional Resources

• Long list of guides on how to do successful literature searches (https://libguides.swansea.ac.uk/geneticsbiochemistry/literaturesearching)