# Abstract Sifter User Guide, Version 6.0

This beta version of 6.0 not yet available through Dashboard download!

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# Abstract Sifter User Guide – Version 6.0

This user guide describes the functionality of the PubMed Abstract Sifter. The reader is invited to download the tool from the freely accessible ftp site and follow along:

Version 6.0 not publicly available!

This document provides guidance on the use of the Abstract Sifter through a series of screen shots showing the most common tasks in the tool followed by some helpful tips.

## What's new in version 6?

Wait a minute … read this first:

As the Abstract Sifter grows it may get more sheets.  If this is confusing or irritating, please feel free to hide the sheets you don't use or don't use often.  This might simplify your life, which is a good thing.  To hide sheets, right click on the sheet tab you want to hide at the bottom and when the menu pops up, click on Hide.  To unhide, click on any sheet tab and then Unhide where you'll be given a selection of hidden sheets to unhide.

Version 6 has one new major function and a few smaller nice-to-have things.

- Term Expansion – this feature allows the end user to compile a list of terms to be mapped to or expanded by (however you want to look at it) another term.  This is an opportunity to use an ontology or just a set of desired terms and see how often they appear in your corpus and to find them quickly. This feature is learned best by examples so check out the section below.

- If two notes are taken on the same citation and the yes / no / maybe designation are not the same, the Highlight Noted PMIDs function will color the PMID purple.  This feature is useful if you are combining Notes from different researchers and your team wants to find and resolve differences.

In case you didn't know, Version 5.6 had features that facilitate larger, more complex projects.

- The Log sheet now allows the user to select rows and click on Run in Batch. When Batch is selected, each selected query will be run in turn and the results appended.

- The Landscape sheet has a new feature that allows the user to select cells and then click on More Stuff, then Send to Log. On the Log sheet the corresponding queries will be seen in italics (meaning they have not yet been run) and from there the rows can be selected and run in batch. The preferred name value (column B) will be put into column F where it is called the Batch Tag. When a query on the Log sheet is run in batch, the Batch Tag will be appended to the rows retrieved on the Main sheet. The More Things button on the Main sheet has the option to Summarize the row counts by this Batch Tag.

## Let's start!

First open the Abstract Sifter file AbstractSifter_v5.7.xlsm. A security warning may appear. If so, be sure to enable content as shown in Figure 1.
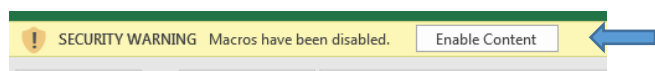


*Figure 1. Enable macros upon opening*

Once open you will see that the Abstract Sifter Excel file consists of 11 sheets. Each sheet is described briefly in the table below.

| Sheet name | Sheet Function |
| --- | --- |
| ReadMe | Basic information on the sifter with links to more documentation |
| Main | Starting point for PubMed queries and for sifting |
| Abstract | The sheet where the citation abstract is shown |

| Notes | Notes and tags are inserted here |
|---|---|
| Log | Log of every query run on Main sheet |
| PathwayQueries | Repository of sample queries to use in research disease or treatment pathways (e.g., AOPs) |
| SampleQueries | Repository of sample queries to use as starting points |
| Landscape | High level view of literature for entities |
| CuratedLists | A place to keep lists of chemicals or other entities |
| TermExpand | Mapping terms to higher level concepts |

The Abstract Sifter is growing.  If you find the number of sheets onerous, hide (or even delete) the ones

you don't use.  For instance, the sheet CuratedLists is pretty specialized.  Feel free to hide it and

unclutter your workspace. To hide a sheet, right click on the tab at the bottom, then click on Hide. To

unhide, click on any sheet, right click and then click on Unhide.  You'll be give a list of hidden sheets to

unhide.  If you don't think you'll use the MeSH Mine function, delete the hidden sheet MappingsHide.

You can also freely change the order of the sheets.

The Abstract Sifter you open is likely to have rows in it from previous use. These are left as examples,

but they may be deleted.  In the Sifter, it is generally best to select an entire row and then click on the

delete button in the Excel toolbar or right-click and then delete.

## Main Sheet
The Main sheet is where the basic functionality of Abstract Sifter occurs, including functions we call

"sifting".  To begin using the Abstract Sifter, the end-user clicks on the *Query PubMed* button at the top

of the screen in the Main sheet. A form is displayed in which the end-user types a PubMed query of

interest (Figure 2).  In the example, we are showing a very simple query: "chlorpyrifos", but these

queries can be more complex.  The text that the user enters into the box is sent to PubMed, so all

PubMed syntax rules apply. (For a review of this syntax, visit

https://www.ncbi.nlm.nih.gov/books/NBK3827/ ) NOTE: NLM changed PubMed early 2020 and

reprogrammed the search algorithms. Since then, the search algorithms used by the web services do

not return the exact counts returned by the PubMed web site.

Note also, that the end-user can optionally append the result of a query to the records currently on the
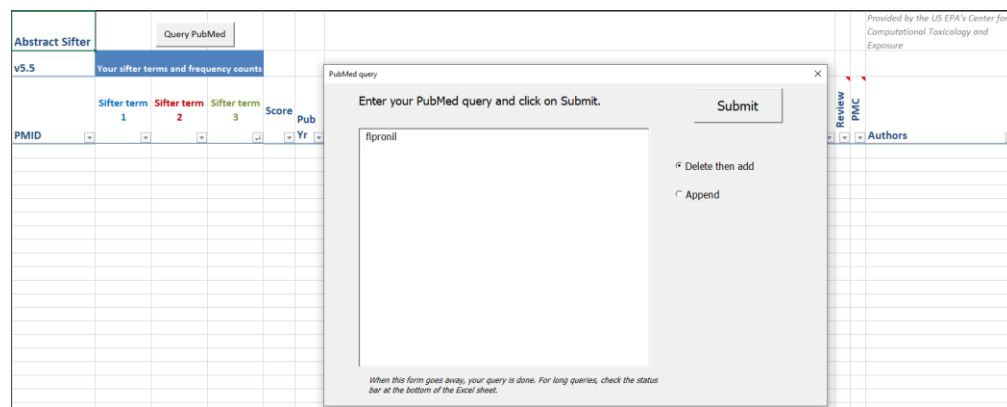
Main sheet.



*Figure 2. Running a PubMed query*

When finished entering the query, the user clicks on *Submit* and the query is packaged by a Visual Basic

Application (VBA) into an e-utility command that is passed to the NCBI (National Center for

Biotechnology Information) web services. (Note that using Sifter Query PubMed capability requires

internet access.) The first response returned by the utility is the number of articles found. (Figure 3) This

number is displayed, and the user is asked if he/she want to continue. If the number of articles is over

10,000, the query will not be run and the user is encouraged to refine the query to return fewer records.
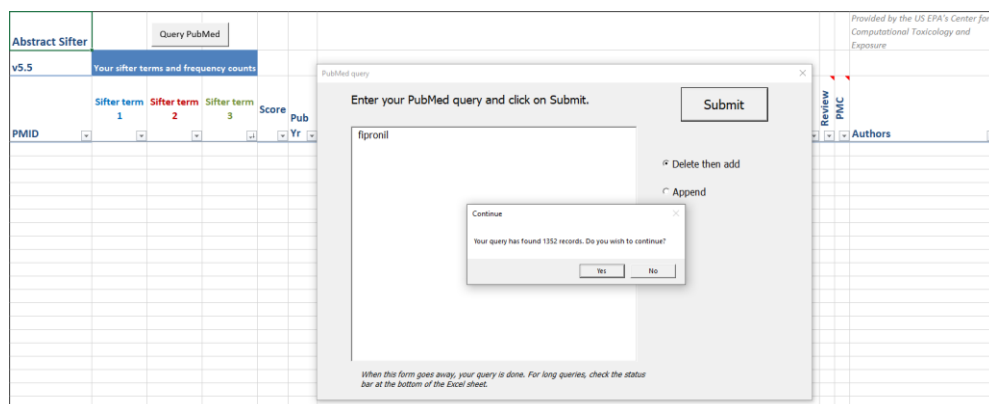
*Figure 3. Responding to PubMed*

If the returned results are fewer than 10,000 and the user indicates he/she wants to continue, the

articles are downloaded from NCBI by Excel, and regular expressions are used to parse the citations for

title, abstract, authors, publication year, journal, and PubMed identifier. Each record returned is

inserted into a row in the Main sheet. Any rows in the Main sheet from a previous query are deleted

unless the end-user chose the Append option.  The Append option adds the new results to the end of

the Main sheet. You can watch the status bar at the bottom of Excel to see how far along the retrieval

process is.  For longer queries, a cancel form will appear and the user can use it to cancel the process.



*Figure 4.Results from PubMed query - before sifting*

At this point the results of the query are stored in the Main sheet and can be browsed like any other

data in a spreadsheet (Figure 4); however, the most effective way to find articles of interest is to use the

innovative sifter functionality. To demonstrate this functionality, we will continue to use our example of fipronil.

Let us suppose at this point that we are looking for dose-response toxicity data for fipronil. We type the term "fipronil" in cell B3, "toxic" in C3, and "mg/kg" in D3.  As we finish typing and move to the next cell, the Abstract Sifter will count the occurrences of the terms in the title, abstract, and key words combined. The citations can then be sorted by these counts, either individually or by the total. Figure 5 shows what the Sifter looks like when these terms have been entered into cells B3, C3, and D3 and then the entries sorted by occurrence counts of "fipronil" in descending order.  PubMed 12442503  has 26 occurrences of "fipronil", 13 of "toxic", and four of "mg/kg".   This article indeed describes a toxic doses of the chemical in various animal species.

| PMID | fipronil | toxic | mg/kg | Score | Pub Yr | Title | Review | PMC | Authors | Journal |
|---|---|---|---|---|---|---|---|---|---|---|
| 32723848 | 26 | 1 | | 27 | 2020 | Preclinical Transplacental Transfer and Pharmacokinetics of Fipronil in Rats. | 0 | 0 | Chang YN, Tsai TH | Drug metabo |
| 31278966 | 23 | 3 | | 26 | 2019 | In vitro inhibition of human CYP2D6 by the chiral pesticide fipronil and its metabolite fipronil sulfone: Prediction of pesticide-dru | 0 | 0 | Carrão DB, Habenchus MD, de Albuqu | Toxicology l |
| 30718154 | 23 | 1 | | 24 | 2019 | Distribution of fipronil in humans, and adverse health outcomes of in utero fipronil sulfone exposure in newborns. | 0 | 0 | Kim YA, Yoon YS, Kim HS, Jeon SJ, Col | Internationa |
| 27067106 | 23 | 10 | | 33 | 2016 | Fipronil sulfone induced higher cytotoxicity than fipronil in SH-SY5Y cells: Protection by antioxidants. | 0 | 0 | Romero A, Ramos E, Ares I, Castellan | Toxicology l |
| 12442503 | 21 | 13 | 4 | 38 | 2003 | Fipronil: environmental fate, ecotoxicology, and human health concerns. | 1 | 1 | Tingle CC, Rother JA, Dewhurst CF, La | Reviews of e |
| 30521755 | 21 | 0 | | 21 | 2019 | Quantitative Detection of Fipronil and Fipronil-Sulfone in Sera of Black-Tailed Prairie Dogs and Rats after Oral Exposure to Fipro | 0 | 1 | Wang K, Vasylieva N, Wan D, Eads D. | Analytical ch |
| 21615307 | 21 | 0 | | 21 | 2011 | Thyroid function tests in persons with occupational exposure to fipronil. | 0 | 0 | Herin F, Boutet-Robinet E, Levant A, D | Thyroid : off |
| 19731660 | 21 | 0 | | 21 | 2009 | Fipronil and its degradates in indoor and outdoor dust. | 0 | 0 | Mahler BJ, Van Metre PC, Wilson JT, I | Environment |
| 27037470 | 20 | 5 | | 25 | 2016 | The toxicity, bioaccumulation, elimination, conversion of the enantiomers of fipronil in Anodonta woodiana. | 0 | 0 | Qu H, Ma RX, Liu DH, Jing X, Wang F, | Journal of ha |
| 22447239 | 20 | 2 | | 22 | 2012 | CYP450-dependent biotransformation of the insecticide fipronil into fipronil sulfone can mediate fipronil-induced thyroid disrupt | 0 | 0 | Roques BB, Lacroix MZ, Puel S, Gayra | Toxicologica |
| 18200855 | 20 | 0 | | 20 | 2007 | Enantioselective microbial transformation of the phenylpyrazole insecticide fipronil in anoxic sediments. | 0 | 0 | Jones WJ, Mazur CS, Kenneke JF, Garr | Environment |
| 27614034 | 19 | 6 | | 25 | 2016 | Environmental behavior of the chiral insecticide fipronil: Enantioselective toxicity, distribution and transformation in aquatic eco | 0 | 0 | Qu H, Ma RX, Liu DH, Gao J, Wang F, | Water resea |
| 15135087 | 19 | 0 | | 19 | 2004 | In vitro metabolism of fipronil by human and rat cytochrome P450 and its interactions with testosterone and diazepam. | 0 | 0 | Tang J, Amin Usmani K, Hodgson E, R | Chemico-bio |
| 22045597 | 18 | 0 | | 18 | 2012 | Adsorption, transport and degradation of fipronil termiticide in three Hawaii soils. | 0 | 0 | Shuai X, Chen J, Ray C | Pest manage |

*Figure 5. After sifter terms were entered into cells B3, C3, D3 and sorting on B3*

## Abstract Sheet

To see the abstract for any of the retrieved articles, we can either click on the PubMed ID hyperlink to be taken to PubMed, or we can double-click on any other cell in the row for this article. This action brings us to the Abstract sheet where the abstract is displayed along with other article meta-data like title and authors (Figure 6).

**Abstract with highlights**    <-- Main    Add Note    See Notes ->    Like this?

| PMID: | 12442503 | | | PubYr | Authors | Journal | Volume | Issue |
|---|---|---|---|---|---|---|---|---|
| Title: | Fipronil: environmental fate, ecotoxicology, and human health concerns. | | | 2003 | Tingle CC, Rother JA, Dewhurst CF, Lauer S, King WJ | Reviews of environmental | 176 | |

Title and Abstract:

Fipronil: environmental fate, ecotoxicology, and human health concerns.   ABSTRACT:  Fipronil is a highly effective, broad-spectrum insecticide with potential value for the control of a wide range of crop, public hygiene, amenity, and veterinary pests. It can generally be applied at low to very low dose rates to achieve effective pest control. Application rates vary between 0.6 and 200 g a.i./ha, depending on the target pest and formulation. It belongs to the phenyl pyrazole or fiprole group of chemicals and is a potent disrupter of the insect central nervous system via interference with the gamma-aminobutyric acid (GABA-) regulated chloride channel. Fipronil degrades slowly on vegetation and relatively slowly in soil and in water, with a half-life ranging between 36 hr and 7.3 mon depending on substrate and conditions. It is relatively immobile in soil and has low potential to leach into groundwater. One of its main degradation products, fipronil desulfinyl, is generally more toxic than the parent compound and is very persistent. There is evidence that fipronil and some of its degradates may bioaccumulate, particularly in fish. Further investigation on bioaccumulation is warranted, especially for the desulfinyl degradate. The suitability of fipronil for use in IPM must be evaluated on a case-by-case basis. In certain situations, fipronil may disrupt natural enemy populations, depending on the groups and species involved and the timing of application. The indications are that fipronil may be incompatible with locust IPM; hence, this possibility requires further urgent investigation. It is very highly toxic to termites and has severe and long-lasting negative impacts on termite populations. It thus presents a long-term risk to nutrient cycling and soil fertility where termites are "beneficial" key species in these ecological processes. Its toxicity to termites also increases the risk to the ecology of habitats in which termites are a dominant group, due to their importance as a food source to many higher animals. This risk has been demonstrated in Madagascar, where two endemic species of lizard and an endemic mammal decline in abundance because of their food chain link to termites. Fipronil is highly toxic to bees (LD50 = 0.004 microgram/bee), lizards [LD50 for Acanthodactylus dumerili (Lacertidae) is 30 micrograms a.i./g bw], and gallinaceous birds (LD50 = 11.3 mg/kg for Northern bobwhite quail), but shows low toxicity to waterfowl (LD50 > 2150 mg/kg for mallard duck). It is moderately toxic to laboratory mammals by oral exposure (LD50 = 97 mg/kg for rats; LD50 = 91 mg/kg for mice). Technical fipronil is in toxicity categories II and III, depending on route of administration, and is classed as a nonsensitizer. There are indications of carcinogenic action in rats at 300 ppm, but it is

*Figure 6a. An abstract with highlighted sifter terms.*

There are several aspects of the Abstract sheet that are important to note.  First, the sifter terms in the abstract are highlighted.  The font colors reflect the colors of the fonts in cells B3, C3, and D3 entered into the Main Sheet. This highlighting makes the reading the abstract easier by drawing attention to sentences that might be of more interest.

With version 3 of the Abstract Sifter, the *Like this?* Button was added to the top of the Abstract Sheet. Click on this button allows the user to find articles in PubMed that are similar to the article on the Abstract sheet or find articles in PubMed Central that cite that article in question. (Figure 6b.)  These functionalities are likely familiar as they are offered on the PubMed Entrez web site. The results can be appended to results already on the Main sheet.  A colorization feature has been added to make the titles either yellow or green.  This way the user can see which rows were from the original query and which were retrieved from the Like this functionality.

*Figure 6b.  Clicking on the Like this? Button on the Abstract Sheet.*

Sifting the results through specifying sifter terms in B3, C3, and D3 can be repeated as many times as the user wishes. Similarly, new PubMed queries can be run, altered, rerun.  There are no restrictions on either of these activities other than the 10000 record return limit.

## Notes Sheet

 Given the dynamic nature of the Sifter, many users find it helpful to be able to make notes on articles that they want to track.  There are two ways using the Sifter to take notes: one way is through the Main sheet, and the other way starts with the Abstract sheet.  To return to our case study, let us say that we have found a set of articles on the Main sheet that we know we need to read in depth. We can select these articles and then click on the *Take Group Notes* button. A form appears where we can enter information into fields called Tag and Notes. These elements are self-defined. We can also click on *yes*, *no*, or *maybe*. The note-taker can enter her/his initials or name in the Who field.  This set of variables is a quick way to associate articles with a note.  Notice that these choices each come with a color (yes-green, no-red, and maybe-yellow). Entering any of these fields is optional. (Figures 7 and 8.) When we

click on the *OK* button, each article selected will be inserted into the Notes page with the corresponding information (Figure 9) and the PubMed ID (PMID) on the Main sheet will be colorized.
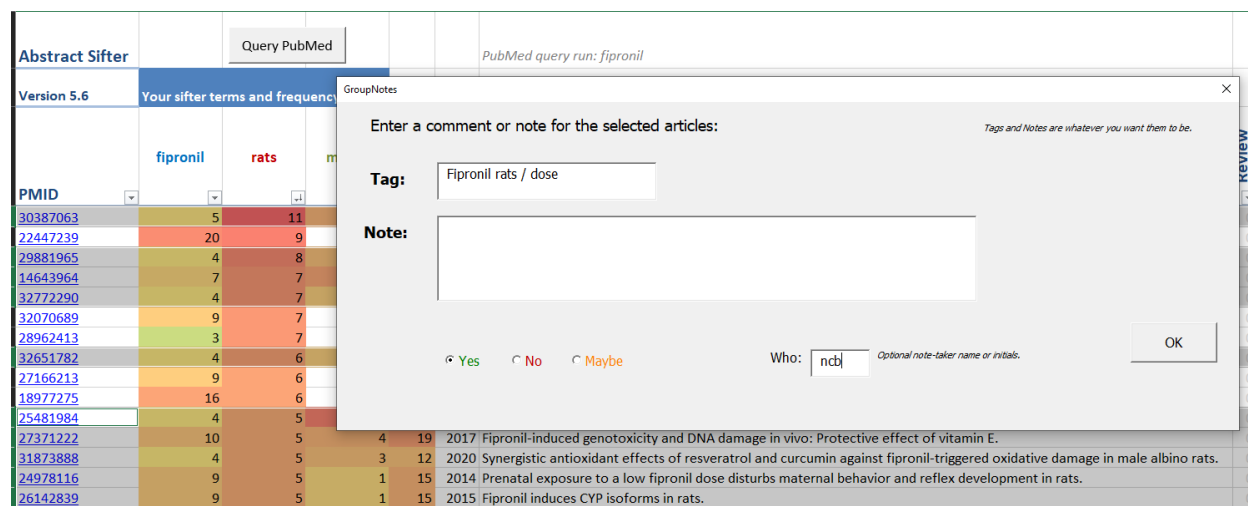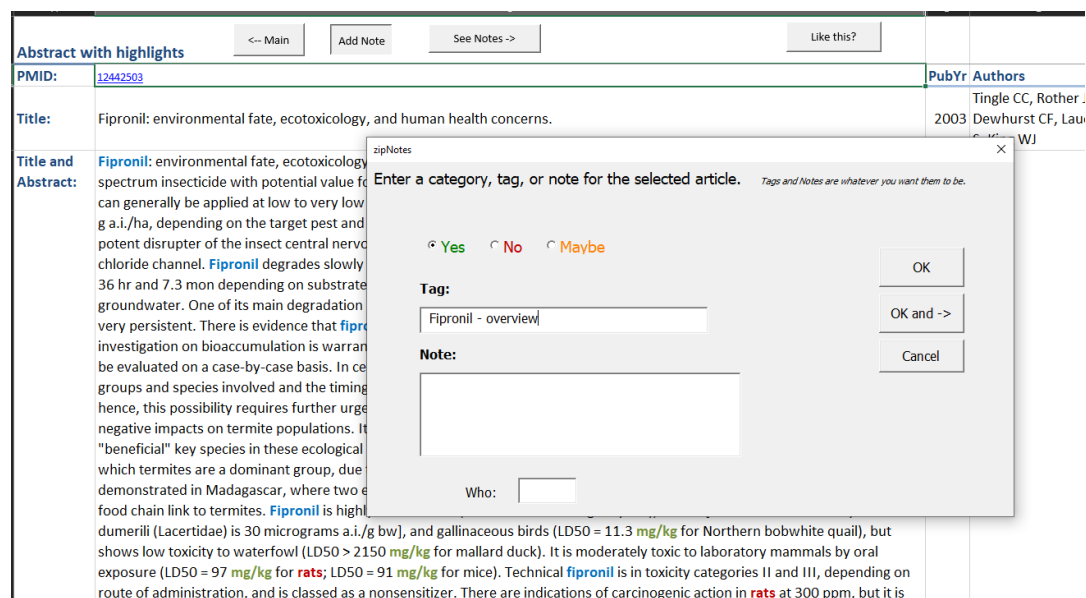


*Figure 7. Taking group notes.*



*Figure 8. Taking single notes on the Abstract sheet.*

*Figure 9. The Notes page. Remember to save your workbook.*

The second option for note taking starts with the Abstract Sheet. (Figure 8) The "Add Note" button in the top row allows notes to be inserted into the Notes Sheet using the same form used to add Group Notes described above.

The note-taking can be used to help keep track of which citations have been read and evaluated and which have not.  On the Main sheet the PMIDs can be sorted by the noted color using the built-in Excel sorting functionality. (Figure 10) The More Things button on the Main sheet will allow the end-user to delete duplicates and highlight noted citations with colorization.



*Figure 10. After clicking on More things, then and then sorting by color*

The user can make changes to the Notes sheet by editing, adding or deleting rows below row 2. In version 4 of the Abstract Sifter, double-clicking on a row in the Notes sheet brings up a curation form (Figure 10a). Here the end-user can enter and update tags, notes. Text in the large box can be selected and dragged to any of the smaller tag and notes boxes. The Refresh button brings the title and abstract back in and refreshes the view. The purpose of this form is to allow quick easy extraction of information from the abstract into separate fields. The copy button sends the elements of the citation and your notes to the clipboard; then you can open up Word and paste the clipboard contents there. The Notes sheet can be copied, printed, or the Notes can be exported to a text file for further import into other tools like Word.

New in this version is the capability to attach a pdf. Before you can attach a pdf, the file must reside on your computer. Click the Attach Local PDF button and find the pdf. You can open the pdf by clicking on the Open button or on the pdf hyperlink in column U. Note that while Abstract Sifter files can be shared with colleagues, the pdfs are local and specific to one machine.



*Figure 10a. Double-clicking on a row in the Notes sheet brings up a curation form.*

## Log / Batch sheet

The Log sheet keeps track of the queries you have run. The Abstract Sifter routines insert a row into the sheet every time you complete a query. These queries can be viewed and rerun. To rerun a query, simply double-click on it. (Figure 11.) Starting with version 5.6 a new feature called Batch Run has been implemented to allow the user to run multiple queries and append the results from each on the Main sheet. To run in batch, select rows and click on the Run in Batch button. A Batch Tag can be added or modified on the Log sheet. This tag will be added to the Main sheet results and used to help summarize the results of multiple runs. This summary functionality is accessible on the Main sheet through the More things button.

Delete any or all rows after Row 2 if you want to clear old entries.

| Log / Batch | | <-- Main | Run in batch | | Note: Feel free to delete |
|---|---|---|---|---|---|
| Date | Record Ct | Query Used (double-click on query to rerun) | | | Batch Tag |
| 1/6/2021 10:42 | 1417 | fipronil | | | |
| 1/6/2021 10:39 | 200 | Articles like 32864299 | | | |
| 1/5/2021 15:37 | 1536 | covid-19 AND chloroquine | | | Triadimenol |
| 1/5/2021 15:26 | 44 | "Triadimenol"[tw] OR "Spinnaker"[tw] OR "Triafol"[tw] AND (toxicity) | | | Triadimenol |
| 1/5/2021 15:26 | 5 | 71441-28-6 OR 4-(2-(5,6,7,8-Tetrahydro-5,5,8,8-tetramethyl-2-naphthenyl)-1E-propen-1-yl)benzoic acid OR 4-(2-( | | | 4-(2-(5,6,7,8-Tetrahydro- |
| 1/5/2021 15:26 | 5 | 71441-28-6 OR 4-(2-(5,6,7,8-Tetrahydro-5,5,8,8-tetramethyl-2-naphthenyl)-1E-propen-1-yl)benzoic acid OR 4-(2-(5 | | | 4-(2-(5,6,7,8-Tetrahydro- |
| 1/5/2021 15:26 | 44 | "Triadimenol"[tw] OR "Spinnaker"[tw] OR "Triafol"[tw] AND (toxicity) | | | Triadimenol |
| 1/5/2021 15:25 | 27 | "TTNPB"[tw] OR "Arotinoid acid"[tw] OR "Ro 13-7410"[tw] AND (toxicity) | | | 4-(2-(5,6,7,8-Tetrahydro- |
| 1/5/2021 15:14 | 33 | "120-21-8"[tw] OR "4-(Diethylamino)benzaldehyde"[tw] OR "4-(N,N-Diethylamino)benzaldehyde"[tw] OR "4-Die | | | 4-(Diethylamino)benzald |
| 1/5/2021 14:56 | 33 | "120-21-8"[tw] OR "4-(Diethylamino)benzaldehyde"[tw] OR "4-(N,N-Diethylamino)benzaldehyde"[tw] OR "4-Die | | | 4-(Diethylamino)benzald |
| 1/5/2021 14:56 | 27 | "TTNPB"[tw] OR "Arotinoid acid"[tw] OR "Ro 13-7410"[tw] AND (toxicity) | | | Triadimefon |
| 1/5/2021 14:56 | 412 | "Triadimefon"[tw] OR "Bayleton"[tw] OR "TDF"[tw] OR "Azocene"[tw] OR "Triadimephon"[tw] OR "Tripinacloraz | | | Triadimefon |
| 1/5/2021 14:56 | 27 | "TTNPB"[tw] OR "Arotinoid acid"[tw] OR "Ro 13-7410"[tw] AND (toxicity) | | | 4-(2-(5,6,7,8-Tetrahydro- |
| 1/5/2021 14:56 | 1257 | "1071-83-6"[tw] OR "Glyphosate"[tw] OR "N-(phosphonomethyl) glycine"[tw] OR "Glyphosat"[tw] OR "N-(Phosph | | | Glyphosate |
| 1/5/2021 14:55 | 27 | "TTNPB"[tw] OR "Arotinoid acid"[tw] OR "Ro 13-7410"[tw] AND (toxicity) | | | 4-(2-(5,6,7,8-Tetrahydro- |
| 1/5/2021 12:43 | 412 | "Triadimefon"[tw] OR "Bayleton"[tw] OR "TDF"[tw] OR "Azocene"[tw] OR "Triadimephon"[tw] OR "Tripinacloraz | | | Triadimefon |
| 1/5/2021 12:43 | 33 | "120-21-8"[tw] OR "4-(Diethylamino)benzaldehyde"[tw] OR "4-(N,N-Diethylamino)benzaldehyde"[tw] OR "4-Die | | | 4-(Diethylamino)benzald |

*Figure 11. View of the Log sheet*

## Landscape sheet

The Landscape sheet provides an overview of the literature to the user for a set of entities, for example, a list of chemicals or genes. Figure 12 shows an example of a Landscape sheet built by a researcher interested in the toxicity of a particular set of chemicals. Let's take a look at that first. Queries designed to find the chemicals of interest are entered into Column C and in this case, a short version of the chemical name is in Column B. The queries in Row 3 are typical ones used in searching for articles about different kinds of chemical toxicity. We will refer to these queries as subject matter queries. (Note: Column A on the Landscape sheet is often hidden. Go ahead and unhide it and use it when you have a DSSTox chemical identifier.)

The premise behind the design of the Landscape sheet is very simple: PubMed queries will be built by taking the values in Column C (in this example chemical names and corresponding CAS numbers) and appending this query text to the subject matter query text in Row 3 with an " AND " in between the two query parts.



*Figure 12. Example of Landscape sheet use*

To illustrate, we will double-click on the cell with the arrow pointer in Figure 13. When we double-click on this cell this tells the Abstract Sifter to take the query text in Column C about Linalool and append it to query text designed to find citations about reproductive toxicity. Figure 14 shows the constructed query. We can then click on *Submit* and the query gets sent to PubMed and we can then see the results on the Main sheet. The number of articles retrieved from PubMed is 5. That count is placed in the corresponding Landscape cell that we just clicked on.

| | Subject queries: | chromos ome aberratio ns OR | carcinoge n* OR precance rous | abnormal OR adverse effects)) | chemica y inducec OR |
|---|---|---|---|---|---|
| **Chemical / Entity query** | | **Genetox** | **Cancer** | **ReproTox** | **NeuroT x** |
| Tetrachloroethylene[majr] | | 42 | 1152 | 39 | 6 |
| Tripropylene glycol OR 24800-44-0 | | 4 | 7 | 0 | |
| Tetrachlorophthalic anhydride | | 1 | 0 | 0 | |
| Linalool | | 41 | 78 | 5 | |
| Tetrabromobisphenol A OR TBBPA | | 16 | 60 | 48 | |
| Dronabinol | | 61 | 470 | 134 | 265 |
| Triphenyl phosphate OR triphenylphosphate | | 9 | 22 | 27 | |

*Figure 13. Double-click on article count cells*



**PubMed Query**

Modify the PubMed query and click on Submit.    [Submit]

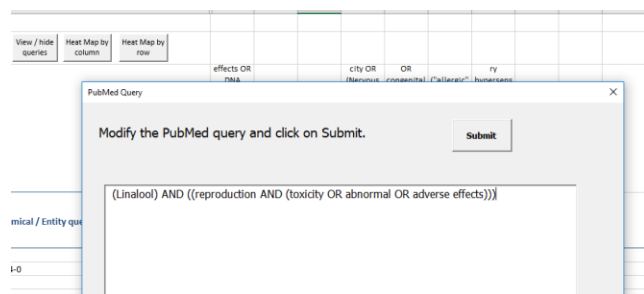(Linalool) AND ((reproduction AND (toxicity OR abnormal OR adverse effects)))

*Figure 14. Constructed query*

Now let's add to the Landscape sheet. Figure 15 shows how we added a new chemical to the list: aspirin. To find out the article counts for aspirin, select empty cells on the same row as aspirin, then click on *Update Article Counts* button. Excel will build each query from the aspirin part and the subject matter part and send each query to PubMed to find out how many citations satisfy the query. The article

counts are placed in the corresponding cells. To run the query and retrieve the results, just double-click on any of the article count cells.



Figure 15. Adding rows to the Landscape sheet



Figure 16. After clicking on Update Article Counts

New subject matter queries can be entered as well. The query part goes into Row 3 and a heading (of your choice) goes into Row 5.  See the example below where the PubMed query part: skin OR dermatitis is entered with the heading skin.  Next highlight the cells underneath and click on the *Update Article Counts* button. The counts of articles satisfying the queries are placed in the cells.  What's happening behind the scenes? For each cell, a query is being built by the Abstract Sifter and sent to PubMed to retrieve a record count.  That record count is then inserted into the corresponding cell. (Figure 17.)

Keep in mind that our examples revolve around chemicals, but that does not mean one is limited to chemicals. The entries in Column C and in Row 3 can be whatever you the end-user want them to be: genes, proteins, diseases, authors …



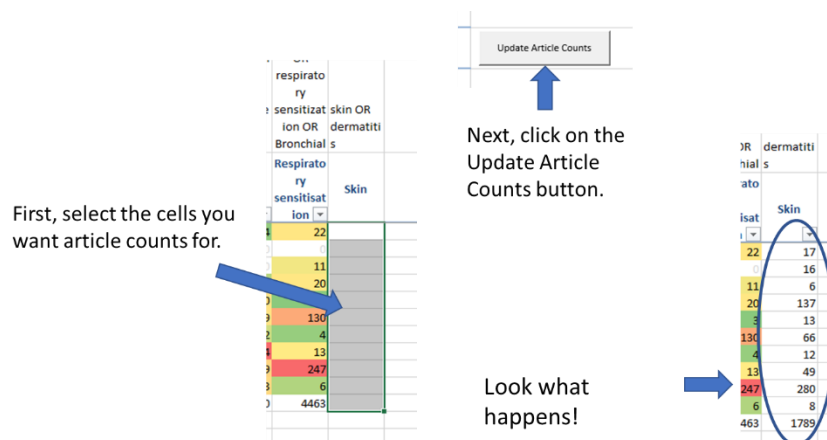*Figure 17. Steps for retrieving counts*

*Making things look good*

The Landscape sheet has three buttons that make formatting easy (Figure 18). The heat map buttons will quickly apply heat map coloring to the cells with article counts either by column or by row. Try them out!
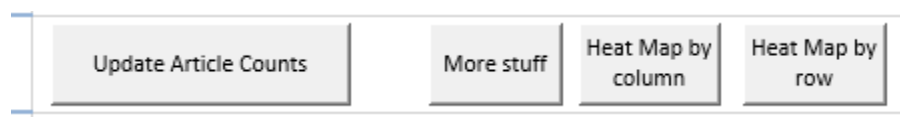


*Figure 18. Buttons on the Landscape page include formatting actions.*

## Sample_Queries and Pathway_Queries Sheets

These two sheets function in a very similar way.  We will use the Sample_queries sheet as an example in this user guide.  Both sheets contain a number of sample subject matter queries that the end user can use as a starting point for building a Landscape view of a set of entities.  Let's see how.  First, we will clean off the old subject matter queries by deleting columns E-L on the Landscape sheet. (You can let the previous work stay if you wish.) Next, on the Sample_Queries sheet we will select rows with queries of interest then we click on the button *Send Queries to Landscape* (Figure 19).



| Sample Queries | | Note: these are starting points … please expand and customize | Send queries to Landscape |
| --- | --- | --- | --- |
| Category | Heading | Query (double-click to see how the query looks to PubMed) | |
| Methods | In vitro | In Vitro Techniques[mh] OR cell culture or "in vitro" | |
| Mixtures | Mixtures | (Drug synergism[mh] OR cocarcinogenesis OR  pesticide synergists[mh] OR mixture[tiab] OR mixtures[tiab] OR Drug Antagonism[m | |
| Medicine | Clinical trials | ((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trial[Publication Type] ) | |
| Medicine | Clinical trials in children | ((children OR child OR infants) AND human) AND ((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trial[Publication Typ | |
| Medicine | Obesity | (obesity OR obese OR adipose OR overweight Or adipogenesis OR adipose tissue) | |
| Toxicity | Genetox | (dna/drug effects OR DNA Damage OR chromosome aberrations OR genotoxicity OR micronucleus  OR DNA Repair OR mutagenicity | |
| Toxicity | Cancer | neoplasms or cancer OR carcinogen* OR precancerous | |
| Toxicity | ReproTox | (reproduction AND (toxicity OR abnormal OR adverse effects)) | |
| Toxicity | NeuroTox | (neurotoxicity OR (Nervous system diseases and chemically induced) OR ((neurons OR brain OR behavior) AND drug effects) | |
| Toxicity | DevTox | ((toxicity OR congenital abnormalities OR Prenatal Exposure Delayed Effects) AND (fetus OR embryo OR embryonic development O | |
| Toxicity | Skin sensitization | ("allergic" AND "contact" And dermatitis) OR Dermatitis, Allergic Contact[mh] | |
| Toxicity | Respiratory sensitisation | (Respiratory hypersensitivity OR respiratory sensitization OR Bronchial Hyperreactivity OR Respiration Disorders OR Respiratory Tra | |
| Toxicity | DNT | ((Brain OR central nervous system OR "CNS" OR "neural tube" OR spinal cord OR spina bifida OR Nervous System Diseases or Neura | |
| Use | Pharmaceutical | "therapeutic use" OR "therapeutic use"[subheading]" OR pharmacologic actions[mh] OR drug therapy | |
| Use | Pesticide | pesticide OR insecticide OR rodenticide OR fungicide | |
| Use | Cosmetics | cosmetics OR beauty | |
| Use | Explosive Agents | Explosive Agents OR explosive OR explosives | |
| Use | Food | food OR diet OR beverage OR nutrition OR eating | |
| Use | Surface-acting | Antifoaming OR Anti-foaming OR detergent OR detergents OR soap OR detergent  OR surfactant | |
| Use | Dye/coloring | dye OR "coloring agent" OR pigment OR pigments | |
| Use | Fertilizer | fertilizer OR fertilize | |
| Use | Solvents | solvents OR solvent | |

*Figure 19. Selecting rows with queries of interest*

Our Landscape sheet then looks like Figure 20.

*Figure 20. New queries on Landscape sheet*

Next, we select the article count area and then click on *Update Article Counts*.



*Figure 21. Selecting the cells for article counts*

Once the article counts are populated, we click on Heat Map by Row and then on Hide queries. Our resulting Landscape view looks like Figure 22. To run the query and retrieve the results, just double-click on any of the article count cells.

Note that the Pathway_queries sheet works the same way: select the rows of interest and click on the button *Send queries to Landscape*. To add your own queries to either the pathway or sample queries sheets, just enter in new rows. Use the existing rows as a template to indicate where headers go and where the query text goes. Be mindful of parentheses and be sure to test the queries.

| (optional) DSSTOX link to Dashboard | Preferred Name | Chemical / Entity query | Food | Surface-acting | Genetox | Cancer | ReproTox | NeuroTox | DevTox | Skin sensitization |
|---|---|---|---|---|---|---|---|---|---|---|
| DTXSID1021322 | Disulfiram | 97-77-8 OR Disulfiram | 308 | 29 | 169 | 569 | 38 | 739 | 26 | 25 |
| DTXSID6024337 | Thiobencarb | 28249-77-6 OR Thiobencarb OR benthiocarb | 9 | 0 | 2 | 7 | 5 | 12 | 6 | 1 |
| DTXSID3023556 | Retinol | 68-26-8 OR Retinol OR Vitamin A | 19770 | 585 | 1690 | 14925 | 1235 | 3160 | 1276 | 38 |
| DTXSID2022880 | Danazol | 17230-88-5 OR Danazol | 94 | 43 | 37 | 624 | 101 | 118 | 11 | 0 |
| DTXSID9020453 | Dieldrin | 60-57-1 OR Dieldrin | 995 | 23 | 95 | 328 | 108 | 254 | 78 | 0 |
| DTXSID7032638 | Pyraclostrobin | 175013-18-0 OR Pyraclostrobin OR pyrachlostrobin | 146 | 10 | 17 | 5 | 9 | 15 | 21 | 0 |
| DTXSID8024151 | Imazalil | 35554-44-0 OR Imazalil OR enilconazole | 166 | 4 | 24 | 28 | 12 | 11 | 11 | 3 |
| | Linalool | Linalool | 1093 | 35 | 46 | 99 | 6 | 174 | 30 | 65 |
| | Styrene | Styrene[majr] | 366 | 444 | 206 | 496 | 60 | 200 | 56 | 4 |
| | TPHP | Triphenylphosphate OR "triphenyl phosphate" | 96 | 5 | 13 | 30 | 31 | 38 | 38 | 3 |
| | PERC/TCE | Trichloroethylene[majr] | 109 | 51 | 117 | 633 | 79 | 212 | 61 | 10 |
| | Dronabinol/THC | Dronabinol | 513 | 46 | 64 | 504 | 144 | 2772 | 64 | 3 |

*Figure 22. New Landscape view*

## TermMap Sheet

Term mapping is a new functionality that is motivated by the following questions that some users have asked.

- There is a set of terms I always sift on to find articles relevant to my work. Can I somehow sift on them all at once?
- I am doing research on ocean warming and its effect on fish. I have a list of over 100 fish species I am interested in. Can I find the citations quickly that have any of these fish? And because my species are in a family ontology, can I sift on the family name, too?
- Can I map genes of interest to a specialized ontology?

The Term Map has built in examples. Let's walk through one of them here.

On the Main sheet, run the query: coral AND (ocean warming OR climate change) This query will return approximately 1750 records. Then go to the Term Map sheet and click on More. (The TermMap sheet may have stuff on it – just ignore.) A form is displayed that looks like the one in Figure 23. Click on the Coral Ontology button. (Check out the other examples later!)

*Figure 23.  TermMap sheet More button actions*

The TermMap sheet is then populated with what might be a coral ontology.  Please note – this is NOT a real ontology.  It is made up to be an illustration of what you can do.  The coral names may be real, but the color categories are completely made up.  Next, click on the Map! Button.  After a few seconds you will see in numbers appear in Column C.  (Figure 24.) These are counts of the number of citations from Main that contain the term in Column B.   The term *zoanthid* is in 2 articles, *Acropora millepora* in 45.

| Term Expand / Map | | |
|---|---|---|
| Version 6.0 | | |
| Map to this: | When you see this: | Count |
| Coral | Anthozoa | 923 |
| Coral:red | Pocillopora damicornis | 54 |
| Coral:red | Acropora millepora | 46 |
| Coral:red | Stylophora pistillata | 39 |
| Coral:red | zoanthid | 2 |
| Coral:red | M. annularis | 2 |
| Coral:red | Acropora muricata | 12 |
| Coral:red | Porites lutea | 8 |
| Coral:red | Colpophyllia natans | 2 |
| Coral:red | Seriatopora hystrix | 9 |
| Coral:red | Anthropocene | 23 |
| Coral:red | brain coral | 4 |
| Coral:red | Orbicella annularis | 3 |
| Coral:red | A. muricata | 4 |
| Coral:red | Meandrina meandrites | 1 |
| Coral:red | Diploria labyrinthiformis | 4 |
| Coral:red | Pseudodiploria strigosa | 10 |
| Coral:red | Agaricia agaricites | 1 |
| Coral:red | Porites porites | 1 |
| Coral:blue | P. verrucosa | 1 |
| Coral:blue | Ctenactis echinata | 1 |
| Coral:blue | P. eydouxi | 0 |
| Coral:blue | Eusmilia fastigiata | 1 |
| Coral:blue | Isopora palifera | 2 |
| Coral:pink | Dichocoenia stokesi | 1 |

*Figure 24.  TermMap sheet after Map! Action has counted occurrences of the terms.*

The Abstract Sifter did more than just count the articles where it found the terms. The Sifter changed the abstract for each citation in which at least one of the terms was found.  (Of course, the abstract is changed only in the Sifter, not at PubMed. Rerunning the query will refresh the abstracts back to their original state.)

Here's how the abstract is modified:  if any of the column B terms was found in the title and abstract, then "TERMX:" was appended to the abstract.  For each column B term found, "TX: " and the column A value plus the Column B value were stuck on the end of the abstract.

To see an example that will make this clearer … see Figure 25 below of an abstract on the Abstract Sheet.  At the end you see "TERMX: |TX:Coral:Anthozoa |TX:Coral:red:Seriatopora hystrix"

*Figure 25. How term mapping changes the abstract. See the circled area.*

Two of the coral column B terms were found and appended along with their Column A values Coral and Coral:red.

In the Abstract Sifter, if text exists in the abstract column that means it can be sifted on! There are three new ways to sift if you map terms.

1. On the Main sheet, in cell B3, C3, or D3 - Sift on *TERMX:* … this will show you any citation that has a least one of the column B terms.
2. On the Main sheet, cell B3, C3, or D3 - Sift on *TX:* … this will count the number of terms from column B found in the citation.
3. Sift on a value in column A or column B. To do this quickly, stay on the TermMap sheet and double-click on a term in either A or B and see what happens. (What does happen? The Sifter copies the term to the Main sheet cell B3, lets the Main sheet sift the results, and then sorts by B3. It happens fast, but it is very simple.)

## Exporting to other applications from the Notes sheet

The Abstract Sifter allows the user to export articles from the Notes sheet to outside applications. On the Notes sheet there is a button labeled *Export*. By clicking on this button, the form in Figure 26 appears. The first set of radio buttons allows the user to select what data is exported and how the records should be formatted. Next the user can choose to export all entries / rows on the Notes sheet or just selected rows. If the end-user selects PMIDs to be exported, the PMIDs will be formatted in the box. In this case, clicking on Next Step will copy the formatted PMIDs to the clipboard, ready to be pasted to the next application. They should then be pasted into the destination. In the case of PubMed, they should be pasted into the query box in PubMed Entrez. (Figure 27) From PubMed, the citations can be downloaded in a variety of formats, including a format that can be imported into citation management software (Figures 28 and 29).

*Figure 23. Form that appears after clicking on Export button*



*Figure 24. Paste PMIDs in the query box to retrieve the records.*



*Figure 24. In PubMed, click on Send to*

*Figure 25. Dialog box for exporting to citation manager*

When the user clicks on the Create File button, a file is created and downloaded in nbib format and can be imported into most common reference manager software.

If the end-user specifies RIS format or text format, files will be created. The user will specify the location and name of the files. The text file option includes the abstract, tags, and notes.

## Helpful Tips and Guidelines

### Tip 1 – checking quality of results

The Landscape sheet is a great way to explore a set of chemicals, but some chemical names are long, complex, and a challenge to PubMed. If you copy and paste a chemical name from another source, make sure it does not have any special characters. Non printing escape characters make the web service calls give unexpected results, but the PubMed web site knows how to ignore them.

For other types of errors or strange results, it's a good idea to check it in PubMed. You can take any query generated by the Abstract Sifter and copy and paste it into PubMed using Ctl-C to copy and Ctl-V to paste. For example, the query in the box shown in Figure 29 is selected and copied (with Ctl-C). Then in PubMed the query is pasted into the query line at the top as shown in Figure 30. On the right side of the page is a box entitled *Search Details*. Click on the *See More* … link to expand this box. Figure 31 shows the information provided by PubMed about how it expands the query. If you need to learn more about PubMed queries, click on *Help* on the PubMed home page.
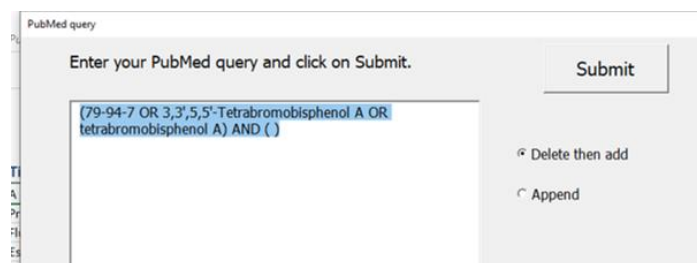
*Figure 29. Select and Ctl-C to copy*
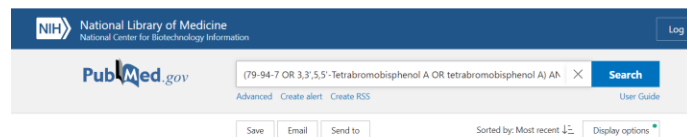


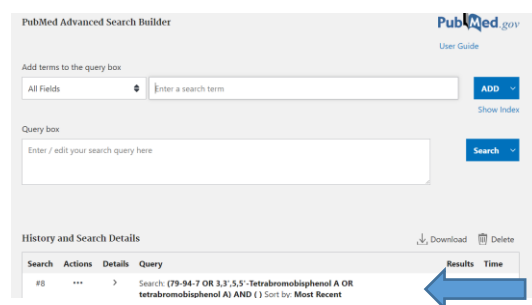*Figure 30. Ctl-V to paste in PubMed then search*



*Figure 26. See what PubMed does to expand your search*



*Figure 32. PubMed query breakdown and expansion*

Note that after PubMed rolled out its new version in 2020, not just the looks of the site changed.  They

redid the search algorithms. As of this writing, the web service had not changed to use the new search

methods – that means for the first time we are noticing small differences in the returned record counts.

## Tip 2 – Sifting the chemical literature

It can be very helpful in chemical research to include the chemical name in the sifting process. This is

because a chemical can be mentioned in an abstract even in cases where the article is not really about

the chemical and will be retrieved in the PubMed query (depending on how the query is worded).

Counting the occurrences of the chemical name in the abstract through the sifting process can help the

user discriminate between articles mentioning a chemical or those that are actually about the chemical.

## Tip 3 – cleanup and customization

The Abstract Sifter can be cleaned up by deleting rows and columns from previous work, but the

Abstract Sifter programming requires certain columns and rows to be in certain places.  To learn how to

clean up your sifter without disrupting the behind-the-scenes coding, consult the table below.

| Sheet name | Advice for cleaning |
|---|---|
| Main | Do not add columns. Rows will be added and deleted by the Sifter. |
| Abstract | Do not add or delete rows or columns. The Sifter software updates this sheet. |
| Notes | Delete any unwanted rows after Row 2. Do not add or delete columns. |
| Log | Delete any unwanted rows after Row 2. Do not delete columns. Add columns after G if desired. |
| Sample_Queries | Delete unwanted rows after Row 3. Modify and add rows as desired, following the pattern of current rows. (That is, keep the heading in column B and the query text in column C.) *Hint: use this sheet to keep queries important to your organization.* |
| Pathway_queries | Delete unwanted rows after Row 3.  Modify and add rows as desired, following the pattern of current rows. |
| Landscape | Delete or modify rows after Row 4 and columns after Column D. |

| CuratedLists | Delete or modify rows after Row 3 and columns after Column C. |
|---|---|
| TermMap | Delete or modify rows after Row 3. |

Keep in mind that the Abstract Sifter is an Excel file.  You can rename it, mail it, and of course, if you want to keep your Log, Notes, and Landscape entries, you should save it.  The Sample_queries sheet provides an opportunity for you and your organization to start collecting and organizing queries that you have found useful. As mentioned earlier, feel free to hide any sheets you don't use to keep your workplace streamlined.

## Tip 4 – Collaborative literature review tips

Sometimes more than one person will want to work together on evaluating a set of articles. The Abstract Sifter has some features to make this easier.  So, let's say Mary and Joe each retrieve, sift, and take notes on their own Abstract Sifter files.   Mary can copy Joe's notes to her version of the Sifter and then she has both sets. (Or they can mail the Sifter back and forth … )



*Figure 33. Notes from two reviewers combined on the Notes sheet.*

To see if she and Joe disagreed on any record, she can click on More Stuff then Highlight Conflicting. The titles of Notes with different yes/no/maybe designations are colorized in purple. Resolving the conflicts and re-clicking on the button will cause the purple to disappear.

| PMID | yes | no | maybe | Who | Tag | Note | PubYr | Title | Auth |
|---|---|---|---|---|---|---|---|---|---|
| 22045597 | 0 | 0 | 1 | joe | | | 2012 | Adsorption, transport and degradation of fipronil termiticide in three Haw | Shua |
| 22045597 | 1 | 0 | 0 | mary | Helpful | | 2012 | Adsorption, transport and degradation of fipronil termiticide in three Haw | Shua |
| 26142839 | 0 | 1 | 0 | mary | | | 2015 | Fipronil induces CYP isoforms in rats. | Caba |
| 26142839 | 1 | 0 | 0 | mary | Helpful | | 2015 | Fipronil induces CYP isoforms in rats. | Caba |
| 9860498 | 0 | 0 | 1 | joe | Somewhat interesting | | 1998 | Mechanisms for selective toxicity of fipronil insecticide and its sulfone me | Hain |
| 9860498 | 1 | 0 | 0 | mary | Helpful | | 1998 | Mechanisms for selective toxicity of fipronil insecticide and its sulfone me | Hain |
| 12442503 | 1 | 0 | 0 | mary | Helpful | | 2003 | Fipronil: environmental fate, ecotoxicology, and human health concerns. | Tingl |

*Figure 34. Purple highlighting on title of conflicting notes.*

## Tip 5 – Connections to the EPA Chemicals Dashboard

The Environmental Protection Agency's Chemicals Dashboard is a great place to find chemical information to enhance your chemical search queries with synonyms and CAS numbers.  Future releases of the Dashboard will offer opportunities to download a list of chemicals formatted for easy insertion into the Landscape sheet. You'll find the Chemistry Dashboard here:

https://comptox.epa.gov/dashboard.

The EPA Chemicals Dashboard also contains its own (slightly different) version of the Abstract Sifter. It works on the same basic premise as the Excel version, but has some interesting differences.  To see it, start with a chemical search.  Let's look at the chemical fipronil by entering the name in the search box and clicking on the search icon (magnifying glass) (Figure 35).

*Figure 35. Searching for fipronil on the EPA's Chemistry Dashboard entry form*

The main page for fipronil is displayed with the structure diagram and a selection of tabs below that lead

to other information about the chemical.  Click on the Literature tab as shown in Figure 33.



*Figure 36. Select the Literature tab then on PubMed Abstract Sifter (see below).*

*Figure 37. How to select prepared queries.*

Select PubMed Abstract Sifter on the left set of buttons.    The Dashboard helps you to build queries for this chemical.  The chemical identifier part of the query is prepopulated on the right with name and CAS number.  The subject matter part of the query is determined by selecting a topic area in the pull-down box in the center of the form. The user has several pre-composed queries to choose from.  When one of them is chosen, the query is modified by appending the subject matter text. Figure 37 shows that when Metabolism/PK/PD is chosen, the text (metabolism OR metabolite OR tissue distribution OR pharmacokinetics OR pharmacodynamics) is appended to the chemical identifiers.  The query can be modified manually as well. When ready, the user clicks on Retrieve Articles.

*Figure 38. Sifting on the EPA Chemicals Dashboard's PubMed Abstract Sifter.*

After the user clicks on Retrieve Articles, the article information is retrieved from PubMed and inserted into the results table. The articles can be sifted by entering terms into the boxes shown. In the example in Figure 38, the user has entered tissue into one box and kinetic into the other. The occurrences of these terms are counted for each PubMed citation and displayed. The table can be sorted on these values. Clicking on a row tells the Dashboard Sifter to display the title and abstract below the table with the sifter terms highlighted.

A check box on the left of the table provides a way to select citation rows. Selected rows can be downloaded or sent to PubMed by clicking on the pull-down box to the right.



*Figure 39. How to select and download citations.*

Notice, too, that the blue button above lets the user download the Excel version of the Abstract Sifter.

This button will always download the most up-to-date version. Check back periodically with the EPA's

Chemicals Dashboard to learn about enhancements to PubMed Abstract Sifter.

## Populating the Excel Abstract Sifter from the EPA CompTox Chemicals Dashboard

The Chemicals Dashboard can download chemicals in a variety of formats. One of those formats make it

easy to use in the Excel Abstract Sifter. Here's an example to get you started. On the home page of the

Dashboard, click on Lists, then chemical (Figure 40.)
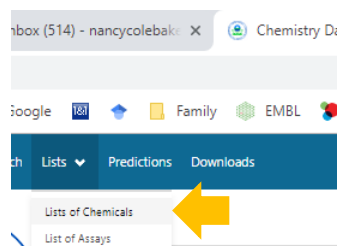


*Figure 40. Download a list of chemicals.*

Pick a list. We'll pick Algal Toxins as a sample. Click on the name, then, when the chemicals appear, click
on Send to Batch Search. (Figure 41.)
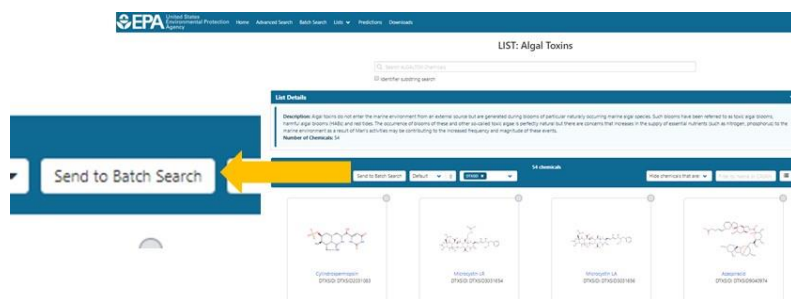


*Figure 41. Send a list of chemicals to Batch Search.*

The batch search page looks like Figure 41.

*Figure 42. Send a list of chemicals to Batch Search.*

Click on the following:  Download Chemical Data, then Download as Excel, then Abstract Sifter Input File (Beta), then (finally) the Download bar. This action will download the chemicals to Excel. Open that file. It will have 2 sheets. Open the one that is called Abstract Sifter.  It looks like Figure 43. On the Abstract Sifter Landscape sheet, unhide column A.  This is done by clicking on the left border of Column B, then right-clicking to see the menu where you can click on *Unhide*.  Paste rows from the downloaded spreadsheet onto the Landscape sheet as in Figure 45.



*Figure 43. Excel view of downloaded chemicals on*

*Abstract Sifter sheet.*
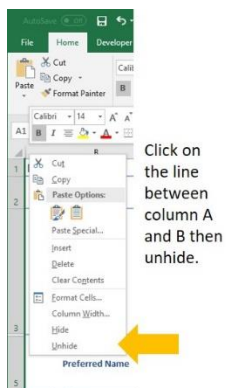
*Figure 44. Unhide column A on the Landscape sheet in order to paste the DSSTox number there.*



*Figure 45. This is what the sheet will look like after unhiding Column A and pasting the chemicals downloaded from the Dashboard.*

Now, enter subject matter queries, or, if you already have queries in place, select the intersecting cells and click on *Update Article Counts*. Click on one of the Heat Map buttons to make it pretty.

| | A | B | C | E | F | G |
|---|---|---|---|---|---|---|
| 1 | **Abstract Sifter** | **Landscape View** | | | | |
| 2 | | | Update Article Counts | View / hide queries | Heat Map by column | Heat Map by row |
| 3 | | | *Subject queries:* | (dna/drug effects OR DNA Damage OR chromosome aberrations OR | neoplasms or cancer | (reproduction AND (toxicity OR abnormal OR adverse effects)) |
| 5 | **DSSTOX link to Dashboard** | **Preferred Name** | **Chemical / Entity query** | **Genetox** | **Cancer** | **ReproTox** |
| 6 | DTXSID2031083 | Cylindrospermopsin | 143545-90-8 OR Cylindrospermopsin | 48 | 15 | 8 |
| 7 | DTXSID3031654 | Microcystin LR | 101043-37-2 OR Microcystin LR OR cyanoginosin LR | 89 | 129 | 74 |
| 8 | DTXSID3031656 | Microcystin LA | 96180-79-9 OR Microcystin LA OR cyanoginosin-LA | 1 | 1 | |
| 9 | DTXSID9040974 | Azaspiracid | 214899-21-5 OR Azaspiracid | 2 | 12 | 1 |
| 10 | DTXSID3074313 | Saxitoxin | 35523-89-8 OR Saxitoxin | 20 | 51 | 5 |
| 11 | DTXSID60166611 | beta-N-Methylamino-L-alanine | 15920-93-1 OR beta-N-Methylamino-L-alanine | 13 | 13 | 10 |
| 12 | DTXSID70207660 | Decarbamylsaxitoxin | 58911-04-9 OR Decarbamylsaxitoxin | 0 | 0 | 0 |
| 13 | DTXSID60214520 | Gonyautoxin V | 64296-25-9 OR Gonyautoxin V | 0 | 0 | 0 |
| 14 | DTXSID20274180 | L-Domoic acid | 14277-97-5 OR L-Domoic acid OR domoic acid | 78154 | 279707 | 12022 |
| 15 | DTXSID90423027 | palytoxin | 77734-91-9 OR palytoxin | 6 | 30 | 2 |
| 16 | DTXSID50867064 | Anatoxin a | 64285-06-9 OR Anatoxin a OR anatoxin I | 6 | 4 | 6 |
| 17 | DTXSID60879996 | Brevetoxin A | 98112-41-5 OR Brevetoxin A | 1 | 2 | |
| 18 | DTXSID20879997 | Brevetoxin 2 | 79580-28-2 OR Brevetoxin 2 | 4 | 3 | 1 |
| 19 | DTXSID40879999 | Brevetoxin C | 98225-48-0 OR Brevetoxin C | 6 | 14 | 4 |
| 20 | DTXSID40880000 | Ciguatoxin 1 | 11050-21-8 OR Ciguatoxin 1 | 2 | 30 | 2 |

*Figure 46. Downloaded chemicals and queries with subject matter queries.*

Now you have an overview of your chemicals and what literature is out in PubMed for them. Take advantage of the iterative nature of the Abstract Sifter to query, sift, read, note as much as you need.

## Contact:

Contact Nancy Baker at baker.nancy@epa.gov with issues, ideas, and feedback.