

NTP Pathology Bioassay Workflow

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Function

The NTP Pathology Data workflow allows users to review individual animal histopathology data as well as incidence statistics for histopathology findings by test article.

This tutorial will outline the necessary steps to retrieve test articles, study numbers and individual animal data associated with neoplastic and non neoplastic findings. The dataset is selected by filtering the data available for NTP toxicity and carcinogenicity studies by study details, subject details and specific findings (i.e. lesion type, morphology, organ, site, distribution, and severity). Users can also query the data for statistically significant tumor findings by filtering the dataset by study details, subject details, or specific findings (i.e. level of statistical significance, organ, and morphology).

This tutorial details how to use the NTP Pathology Data guided search to:

- Generate an individual animal histopathology dataset matching user submitted criteria
- Generate a summary statistics dataset for histopathology findings matching user submitted criteria

From the CEBS Homepage (<http://tools.niehs.nih.gov/cebs3/ui/>), select the 'NTP Pathology Data' icon under Workflows. The next screen will be the 'NTP Pathology Bioassay Workflow' page with the Individual Animal Data and Incidence Statistics options available as separate tabs.

1) Individual Animal Data

- The Individual Animal Data tab is the home page for the NTP Pathology Bioassay.
- Test article lists may be generated by filtering parameters from three main categories: Studies, Subjects, and Findings.
- Once the study parameters have been defined, click the filter icon to display the individual animal results.

Note: Once any study parameter is selected for any category, the filtering process begins. A timer icon appears that confirms the filtering process has been initiated.

After selecting other parameters from the dropdowns, filtering continues in order to further narrow down the relevant individual animal data list which will be displayed on the next page.

- Select the Reset Values icon to make new selections.

Descriptions of the filtering parameters are described below.

Note: In each section below, none of the fields are required to proceed to the results. Delete and reselect all data choices by clicking the 'Reset Values' icon. A single drop down field can be cleared by selecting the first blank value in the list.

a) Filter Options

i) Filter Studies

Data selections can be made from the following categories:

- Study Accession Number/NTP Study Number: Individual CEBS accession number or NTP study number
- Study Conducted In:
 - 1982 to present (TDMS): Only TDMS studies from 1982 to present
 - 1971 to 1982 (CBDS): Only CBDS studies from 1971 to 1982
 - Combined: All studies conducted from 1971 to present
 - Start Year: Study start year range (YYYY format)
- Study Length (Long Term or Short Term):
 - Long-Term: 2 year chronic
 - Short-Term: Subchronic (14 day, 90 day, 13 weeks, 1 year)

ii) Filter Subjects

Data selections can be made from the following categories:

- Species (common name): Species of test subject (Rat, Mouse)
 - Sex: Gender of test subject (Male, Female)
 - Treatment Group Type: Treatment group identification (Control or Test Chemical)
 - Route: Route of test article administration (Dosed-feed, Gavage, Dermal, etc.)

iii) Filter by Finding

Data selections can be made from the following categories:

- Lesion Type: Neoplastic or Non-Neoplastic lesion Morphology: Lesion morphology list
- Organ: Organ name
- Site: Specific organ site
- Distribution: Distribution of the finding (Diffuse, Local, Multifocal)
- Severity: Finding severity (Minimal, Mild, Moderate, Marked)

b) Single vs. Multiple Selections

Single or multiple selections can be made from the 'findings' filter.

For single selections, click on the dropdown and make the selection from the populated list.

For multiple selections, select the icon next to the dropdown

- Press and hold the Ctrl key (for PC) or Command key (for Mac) while clicking your choices; your selections will be highlighted
- Click the 'Select' icon
- To exit the multiple selection page without committing selection, click 'Cancel'

Note: *The background around the 'multi selection icon' has changed colors indicating that multiple selections have been chosen.*

c) Individual Animal Data Results

Note: Columns can be rearranged in this view by selecting column (in header row) and dragging to the desired location or resized by dragging column edge left or right.

Description of Columns in Individual Animal Data Table:

Field	Description
Chemical Name	Name of test article administered to test subjects
Study #	Unique study identification number
TDMS #	TDMSE study identification number
Start Year	Year study was initiated
Group	Group number
Treatment Group Type	Treatment group identification (Control or Test Chemical)
Dose	Dose level administered to subject
Days on Dose	Days animal was dosed before necropsy
Subject	Animal identification
Species	Species of test subject
Sex	Gender of test subject
Route	Route of test article administration
Body System	Body system classification of selected organ
Organ	Organ name
Site	Specific organ site with the associated finding
Morphology	Lesion name
Severity	Finding severity (Minimal, Mild, Moderate, Marked)
Distribution	Distribution of the finding (Diffuse, Local, Multifocal)

At this point two options exist:

- 1) Return to filter options by selecting the 'Back to Filter Options' icon
- 2) Download and save data to a desired location by selecting the 'Download Data' icon

Note: For download instructions, see [Additional Instructions](#) at the end of this tutorial.

2) Incidence Statistics

- Select Incidence Statistics tab from NTP Pathology Bioassay Workflow home page.
- Test article lists may be generated by filtering parameters from three main categories (A) Studies (B) Subjects (C) Findings. Once the study parameters have been defined, click the filter icon to display the individual animal results.

Note: Once any study parameter is selected for any category, the filtering process begins. A timer icon appears that confirms the filtering process has been initiated.

After selecting other parameters from the dropdowns, filtering continues in order to further narrow down the relevant chemical list which will be displayed on the next page.

- Select the Reset Values icon to make new selections.

Descriptions of the filtering parameters are described below.

Note: In each section below, none of the fields are required to proceed to the results.

Delete and reselect all data choices by clicking the 'Reset Values' icon. You can also clear one drop down field by selecting the first blank value in the list.

a) Filter Options

i) Filter Studies

- Study Accession Number/NTP Study Number: Specify study based on Study Accession Number/NTP Study Number
- Start Year: Creates a chemical list based on a range of years

ii) Filter Subjects

- Species (common name): Use dropdown to select desired species (Rats, Mice)
- Sex: Use dropdown to select desired sex (Male or Female)
- Route: Use dropdown to select route of chemical administration

iii) Filter by Finding

- Statistical Significance: Use dropdown to select desired cut-off P-value
- Organ: Organ name
- Morphology: Lesion morphology list

Note: Only single selections available.

Note: Tumor incidence statistics currently only available for TDMS studies performed between 1982 and the present.

b) Incidence Statistics Results

Note: Columns can be rearranged in this view by selecting column (in header row) and dragging to desired location or resized by dragging column edge left or right.

Description of Columns in Incidence Statistics Data Table:

Field	Description
Chemical Name	Name of test article administered to test subjects
Study #	Unique study identification number
TDMS #	TDMSE study identification number
Start Year	Year study initiated
Species	Species of test subject
Strain	Strain of test subject
Sex	Gender of test subject
Route	Route of test article administration
Vehicle	Vehicle used for test article administration
Diet	Name of dietary feed
Dose	Dose level administered to subject
Is Pool?	Indicates tumors were pooled in accordance with the rules set up for the P08 report
Organ	Organ name
Morphology	Lesion name
P-Value	The calculated p-value based on the poly-3 rates of each dose group For the control group this is the trend p-value, for other groups it is the pairwise p-value Negative p-values indicate a negative trend
# Tumors	Number of tumors with selected criteria

At this point two options exist:

- 1) Return to filter options by selecting the 'Back to Filter Options' icon
- 2) Download and save data to a desired location by selecting the 'Download Data' icon

Note: For download instructions, see [Additional Instructions](#) at the end of this tutorial.

3) Examples

Below are example searches that can be performed in the NTP Pathology Bioassay Workflow. To see what types of questions can be answered using this workflow, follow along with the steps in these examples.

a) Individual Animal Data Search Example

In this example, we will search for data on all test articles with a finding of adenoma or fibroma in the mammary glands of treated female mice.

- 1) Filter studies: Because we are interested in any studies with our finding, under Study Conducted In, select Combined
- 2) Filter subjects: We are interested in female mice that were treated with test articles. By clicking on the dropdown arrows, select the following options: Species (common name) of Mouse, Sex of Female, Treatment Group Type of Test Chemical.
- 3) Filter by finding: The Lesion type of Neoplastic should be preselected; select Neoplastic if it is not preselected. We will use the multiple selection tool to select the Morphologies of both adenoma and fibroma. Click the icon next to the Morphology dropdown arrow. In the Advance Selection window hold down the Ctrl key (for PC) or Command key (for Mac). Click to select “Adenoma”, “Adenoma, Nos”, “Fibroadenoma”, and “Fibroma”. Your selections should be highlighted. When you have selected all four Morphologies, click the Select button at the bottom of the window. The window will close, and the multiple selection icon for Morphology should now be highlighted. Finally, if we are looking for findings in the mammary gland, we will again need to use the multiple selection icon to select both instances of the mammary gland. Follow the same steps to use the multiple selection tool to select both “Mammary Gland” and “Mammary gland”.
- 4) Once you have made these selections, click the Filter button at the bottom of the page. If you want to change any selection, you can do the following:
 - i. To correct one filter, select the blank space at the top of the dropdown list to reset that filter. You will then be able to see all the options for that filter given your other selections.
 - ii. To correct all filters click Reset Values at the bottom of the page.
- 5) Individual Animal Data: Once you have successfully searched for your criteria, you will get a list of the chemicals and doses that had your desired finding (test articles of female mice with mammary gland adenomas or fibromas). This data can be downloaded using the Download Data button, or further filtered using the Back to Filter Options button.

Note: For download instructions, see [Additional Instructions](#) at the end of this tutorial.

b) Incidence Statistics Search Example

In this example we will search for the incidence statistics of studies since the year 2000. We will include statistics for males exposed via gavage with a finding of leukemia.

- 1) Select the Incidence Statistics tab at the top of the page
- 2) Filter studies: Because we are searching for studies that started in the year 2000 or later, enter the year 2000 in the left box for Start Year
- 3) Filter subjects: To include only males exposed via gavage, use the dropdown arrows to make the following selections: Sex of M, Route of GAVAGE
- 4) Filter by finding: For this example we will leave the Statistical Significance at the default value of $P \leq 0.01$. To select incidence statistics for Leukemias, use the Morphology dropdown arrow to select Leukemia: Lymphocytic, Monocytic, ...
- 5) Once you have made these selections, click the Filter button at the bottom of the page. If you want to change any selection, you can do the following:
 - i. To correct one filter, select the blank space at the top of the dropdown list to reset that filter. You will then be able to see all the options for that filter, given your other selections.
 - ii. To correct all filters click Reset Values at the bottom of the page.
- 6) Summary Statistics: Once you have successfully searched for your criteria, you will get a list of the chemicals and doses that had your desired statistics (significant leukemia findings in studies since 2000 on males exposed via gavage). This data can be downloaded using the Download Data button, or further filtered using the Back to Filter Options button.

Note: For download instructions, see [Additional Instructions](#) at the end of this tutorial.

4) Additional Instructions/Information

- 1) 'CEBS Home' icon returns the user back to the CEBS Home page
- 2) Downloading and displaying data in Excel
 - o Select the Download Data Icon
 - o The next screen displays available locations to save data
 - o Once a location has been determined, select Save
 - o To access the data, go to the location where the data was saved
 - o You will notice that the data is saved in text format
 - o Open in Notepad or your favorite text editor

- Select all by choosing Ctrl + A (PC) or Command + A (Mac). This function will highlight the entire document.
 - Right click your mouse and select copy
 - Open Excel
 - Right click your mouse and select paste
 - Save as an Excel document
 - To add filtering options, navigate to the Data Tab in Excel and select Filter
- 3) Flash movie running flex code for CEBS indicates a software platform is being used to create graphics or texts for CEBS
- 4) CEBS data may be cited by navigating to the CEBS Support page, and selecting the [Citing CEBS](#) document under FAQs. Here, instructions can be found on citing NTP Data as well as non-NTP data in CEBS.