

# NATIONAL LIBRARY OF MEDICINE

*Web Resources for  
Environmental Health Research*



SEPTEMBER 12, 2010



THE SEVENTH INTERNATIONAL SYMPOSIUM ON  
RECENT ADVANCES AND ENVIRONMENTAL HEALTH RESEARCH







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**THE NATIONAL LIBRARY OF MEDICINE  
WEB RESOURCES FOR  
ENVIRONMENTAL HEALTH RESEARCH**

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**A Specialized Training Course  
developed for the**

**Seventh International Symposium on Recent Advances in  
Environmental Health Research**

**Presented at  
Jackson State University**

**Jackson, Mississippi  
September 12, 2010**

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## Disclaimer

Every effort has been made to ensure that the screen graphics and the exercises in this document are up-to-date and accurate. However, due to the frequency of Web updates, they may have changed.

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The Oak Ridge Institute for Science and Education (ORISE) is a U.S. Department of Energy institute focusing on scientific initiatives to research health risks from occupational hazards, assess environmental cleanup, respond to radiation medical emergencies, support national security and emergency preparedness, and educate the next generation of scientists. ORISE is managed by Oak Ridge Associated Universities.

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## Preface

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The *National Library of Medicine Web Resources for Environmental Health Research* is designed to meet the needs of environmental and biomedical scientists, researchers, and policy makers who need information on health issues related to exposure to hazardous substances in the environment—including those that are naturally-occurring—and environmental agents known to induce illnesses, including cancer and health disparities.

The National Library of Medicine (NLM) is sponsoring this course to increase awareness of the availability and value of NLM's online environmental health and toxicology information resources that provide invaluable tools to address these issues—for professionals and consumers alike. Participants will receive hands-on practice with selected NLM resources, and demonstrations of other valuable resources will be provided.

Major emphasis will be placed on navigating NLM's TOXNET® (Toxicology Data Network) databases and related resources, which provide access to references, online handbooks, and databases related to the adverse affects of chemicals and other agents. MEDLINE®/PubMed®, NLM's premier medical database will also be covered.

This workbook is designed to be used as a reference following the course. It contains exercises using realistic scenarios for the NLM resources covered as well as information on some of NLM's newest resources and lists of other health information resources selected for their quality and relevant content.



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## Agenda

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12:30 p.m. Welcome and Introductions

12:40 p.m. Introduction

- The NLM Environmental Health and Toxicology Portal
- TOXNET and Related Files: Overview

12:55 p.m. ChemIDplus, HSDB, and IRIS  *(with hands-on practice)*

1:30 p.m. CCRIS, GTENE-TOX, and ITER  *(with hands-on practice)*

1:50 p.m. TRI and TOXMAP  *(with hands-on practice)*

2:45 p.m. MEDLINE/PubMed, TOXLINE, and DART  *(with hands-on practice)*

3:10 p.m. More to Explore *(instructor demonstrations)*

3:50 p.m. Questions and Post-test

4:00 p.m. Class Ends



# Introduction





# Introduction

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## Purpose

The purpose of this training is to familiarize participants, such as biomedical scientists, researchers, and community leaders, with reliable online health information from the National Library of Medicine (NLM) and other resources that address toxicological and environmental health issues pertaining to environmental health disparities and related medical conditions. Skills and knowledge acquired in this course will enable representatives of minority-serving academic institutions to reduce health disparities through the access, use and delivery of environmental health information on their campuses and in their communities.

## Objectives

After completing this course, participants will be able to:

- ▶ Identify and evaluate quality, accurate, and authoritative online resources pertaining to environmental health, toxicology, and related medical information.
- ▶ Demonstrate the ability to perform strategic search techniques to find toxicology and environmental health information.
- ▶ Apply the skills and knowledge obtained in this course to their campus curricula and local communities.

## NLM Online Resources Covered in this Course

The following key resources will be covered in depth with time given for hands-on practice:

- ▶ **ChemIDplus**—access to structure and nomenclature authority databases for the identification of chemical substances cited in NLM databases
- ▶ **Hazardous Substances Data Bank (HSDB)**—comprehensive, peer-reviewed toxicological data for over 5,000 chemicals
- ▶ **Integrated Risk Information System (IRIS)**—carcinogenic and non-carcinogenic information on over 500 chemicals
- ▶ **Chemical Carcinogenesis Research Information System (CCRIS)**—scientifically evaluated and fully referenced data on over 9,000 chemicals
- ▶ **GENE-TOX**—genetic toxicology test data on over 3,000 chemicals resulting from expert peer review of the open scientific literature
- ▶ **International Toxicity Estimates for Risk (ITER)**—side-by-side comparisons of international risk assessment information on over 600 chemicals with links to source documentation
- ▶ **Toxics Release Inventory (TRI)**—information on annual environmental releases of over 600 toxic chemicals from the U.S. Environmental Protection Agency (EPA)

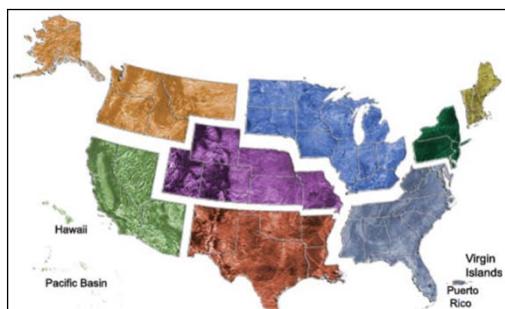
- ▶ **TOXMAP**—a geographic information system that uses maps of the United States to help users visually explore TRI data
- ▶ **MEDLINE/PubMed**—access to more than 19 million references to journal articles published in 5,400 journals in the fields of medicine and the life sciences
- ▶ **Toxicology Literature Online (TOXLINE)**—a bibliographic toxicology database covering over 4 million bibliographic citations
- ▶ **Developmental and Reproductive Toxicology (DART)**—a bibliographic toxicology database covering over 4 million bibliographic citations

The following resources are included in the “More to Explore” section of this workbook. There may not be time for hands-on practice for all of these resources. However, exercises are included in the book for your reference, and the resources will be demonstrated.

- ▶ **Enviro-Health Links**—selected links to Internet resources on toxicology and environmental health issues of recent special interest
- ▶ **ToxSeek**—a metasearch engine that enables simultaneous searching of many different information resources on the World Wide Web
- ▶ **ALTBIB**—a bibliography on alternatives to the use of live vertebrates in biomedical research and testing
- ▶ **Carcinogenic Potency Database**—developed at the University of California, Berkeley, and Lawrence Berkeley Laboratory—provides standardized analyses of the results of 6540 chronic, long-term animal cancer tests (both positive and negative for carcinogenicity) that have been conducted since the 1950s and reported in the general published literature or by the National Cancer Institute and the National Toxicology Program
- ▶ **Haz-Map**—an occupational toxicology database that links job tasks to occupational diseases and their symptoms
- ▶ **Household Products Database**—human health effects information on over 10,000 brand-name consumer products

## NLM Database Assistance

NLM database assistance is available online, by phone, by e-mail, and through the National Network of Libraries of Medicine (NN/LM) health science libraries and information centers.



**The 8 Regions of the NN/LM**

The NN/LM is organized into eight regions coordinated by the NLM. The regional libraries work closely with NLM to provide equal access to biomedical information.

Please refer to the inside back cover of this workbook for information on how to contact these help resources

# The NLM Environmental Health and Toxicology Portal

The NLM's **Environmental Health and Toxicology Portal** provides a starting point for seeking reliable information on toxicology, hazardous chemicals, environmental health, and toxic releases.

**Find Information by Topic & Intended Audience**

**Reference Tools & Additional Resources**

**Search all TOXNET Databases**

[sis.nlm.nih.gov/enviro.html](http://sis.nlm.nih.gov/enviro.html)

Browse the easily navigable site by topic or audience. Explore related resources using the **A to Z Index of Resources**. The **Other Professional Resources** include database descriptions, fact sheets, a list of NLM databases and electronic resources. You can also search all TOXNET databases from this page.

## Additional Resources

For further information, we recommend these additional resources:

- ▶ [Getting the Most from SIS's Environmental Health and Toxicology Resources](http://sis.nlm.nih.gov/getthemostfromsis.html)  
sis.nlm.nih.gov/getthemostfromsis.html
- ▶ [NLM's Environmental Health and Toxicology Resources Quick Tour](http://sis.nlm.nih.gov/enviro/captivate/tehipoverview.htm)  
sis.nlm.nih.gov/enviro/captivate/tehipoverview.htm
- ▶ [Publications and Reference Materials](http://sis.nlm.nih.gov/enviro/enviropubs.html)  
sis.nlm.nih.gov/enviro/enviropubs.html

## TOXNET and Related Files: Overview

NLM's **TOXNET** (Toxicology Data Network) is a free, Web-based system of databases on toxicology, environmental health, hazardous chemicals, toxic releases, chemical nomenclatures, and specialty areas such as occupational health and consumer products. Information includes specific chemicals, mixtures, and products; unknown chemicals; and special toxic effects of chemicals in humans and/or animals.

**Select a TOXNET database to search**

**Search multiple databases**

**Search all databases**

**Link to the EH/Tox Portal**

**Support Pages**

**toxnet.nlm.nih.gov**

Types of information in the TOXNET databases include:

- ▶ Specific chemicals, mixtures, and products
- ▶ Unknown chemicals
- ▶ Special toxic effects of chemicals in humans and/or animals

Click the information icon ( ⓘ) to the right of each database in the **Select Database** column for a description of the database, a link to the fact sheet, and a sample record.

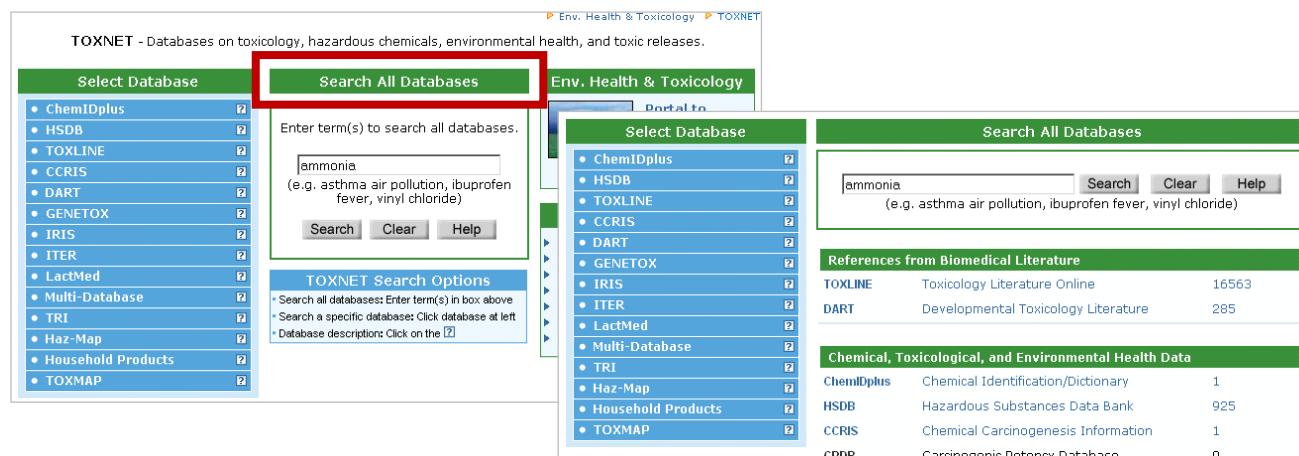
### The TOXNET Databases

The TOXNET databases can be grouped in the following categories:

- ▶ Chemical Nomenclature—ChemIDplus
- ▶ Toxicology Data (one record per chemical)—HSDB, IRIS, CCRIS, GENE-TOX, ITER, and LactMed—can also search any combination of these files with the **Multi-Database** feature
- ▶ Toxicology Literature (bibliographic references)—TOXLINE and DART
- ▶ Toxic Releases—TRI and TOXMAP
- ▶ Specialty Databases—Haz-Map, Household Products Database
- ▶ Basic Searching in TOXNET

## Searching the TOXNET Databases

From the TOXNET home page, you can search all TOXNET databases simultaneously. Your results will be displayed as links to the databases in which your search term(s) were found—and the number of records in each—under the headings: **References from the Biomedical Literature** (TOXLINE and DART) and **Chemical, Toxicological, and Environmental Health Data** (all others).



The screenshot shows the TOXNET home page with a search interface. On the left, a sidebar lists various databases: ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITER, LactMed, Multi-Database, TRI, Haz-Map, Household Products, and TOXMAP. The main area has a search box with the term "ammonia" and search buttons. Below the search box are "TOXNET Search Options" and a list of search terms. To the right, there are two columns of search results. The left column is for "Env. Health & Toxicology" and the right column is for "Chemical, Toxicological, and Environmental Health Data". Each column shows results for TOXLINE (16563 records) and DART (285 records), and a list of other databases with their record counts: ChemIDplus (1), HSDB (925), CCRIS (1), and TOXMAP (0).

**Entering search term(s)**—You may enter any combination of words, chemical names, and numbers, including Chemical Abstracts Service (CAS) registry numbers. Common “stop words” such as “a,” “an,” “and,” “for,” “the,” and “it” will not be searched. When searching for terms other than chemicals, the system automatically searches for singular and plural forms of the term(s) entered.

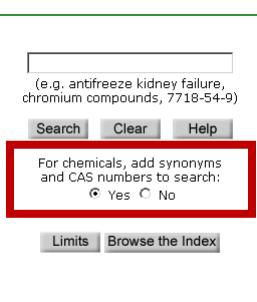
**Synonym searching**—By default the system will search for the exact name, synonyms, and CAS number as derived from ChemIDplus. Select “No” to search only for the exact chemical term or CAS Registry Number entered. In LactMed, the CAS number refers to the parent compound (i.e., not the salt form).

**Truncation**—The asterisk (\*) is the right-handed truncation symbol for any number of characters.

**Phrase searching**—Search phrases with quotation marks.

**Boolean searching**—Use the logical operators “AND,” “OR,” and “NOT” to limit a search of two or more terms to specific criteria. In searches with combinations of these operators, “AND” takes precedence, followed by “NOT” and then “OR.” This default precedence may be overridden with the use of parentheses, which may also be nested (i.e., parentheses within parentheses). Examples:

- ▶ Pulmonary **AND** edema—retrieves all records with the two words appearing together
- ▶ Liver **OR** kidney—retrieves all records containing either of these words (or both of them)
- ▶ Carcinoma **NOT** squamous—retrieves records from which one or more terms have been excluded



The screenshot shows a search interface with a search box and a note: “For chemicals, add synonyms and CAS numbers to search:  Yes  No”. Below the search box are “Limits” and “Browse the Index” buttons.

**Browse the Index**—This feature provides a scannable index of all terms beginning with the search term you entered and the number of records for each term. In the Toxicology Data databases, selectable items indexed are **All Words**, **CAS Registry Number**, and **Chemical Name**. In the Toxicology Literature databases, selectable items indexed are **All Words**, **MeSH Headings/Keywords**, **Authors**, and **CAS Registry Number**.

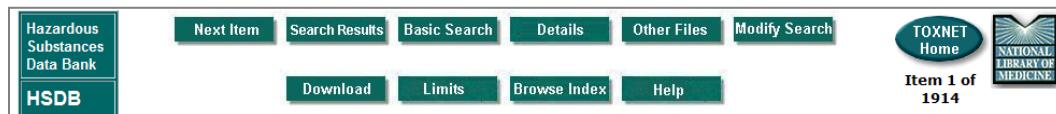
## Search Results Buttons

Buttons on the left of the search results screen allow you to:

Save Checked Items  
Sort  
Details  
History  
Download  
Modify Search  
Basic Search  
Browse Index  
Help  
TOXNET Home

- ▶ **Save Checked Items**—save items in a set for displaying, sorting, and downloading
- ▶ **Sort**—sort the entire search results or items saved in a set
- ▶ **Download**—download the entire search results or items save in a set in brief, full, abstract, or tagged format
- ▶ **Modify Search**—make changes to the most recent search
- ▶ **Basic Search**—conduct a new search in the same database
- ▶ **Browse Index**—browse all words, CAS Registry Number, chemical name, and in bibliographic databases MeSH headings/keywords and authors
- ▶ Go to the **Help** file for that database
- ▶ Go to **TOXNET Home**

## Navigation Buttons



Buttons at the top of the record screen allow you to:

- ▶ Go to the **Next Item** in the search results
- ▶ Go back to the **Search Results** screen
- ▶ Perform a new **Basic Search** in the same database
- ▶ View **Details** of the search
- ▶ Display links to **Other Files** (NLM databases) containing information on the substance
- ▶ **Modify** [your] **Search**
- ▶ **Download** the record or portions of the record
- ▶ Perform a new search in the same database with **Limits** applied
- ▶ **Browse** [the] **Index**
- ▶ Go to the **Help** file for that database

# ChemIDplus, HSDB, and IRIS





## ChemIDplus

**ChemIDplus** is a free, Web-based search system that provides access to structure and nomenclature authority files used for the identification of chemical substances cited in NLM databases. It contains over 370,000 chemical records, of which over 295,000 include chemical structures. Each record in ChemIDplus represents a single chemical or substance. The ChemIDplus database has two different applications: **ChemIDplus Lite** (for basic searching) and **ChemIDplus Advanced** (for more experienced users).

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

### Content

Information in the ChemIDplus database includes:

- Systematic, generic, and trade names
- Synonyms
- CAS registry numbers
- Molecular formulas
- Classification codes
- Chemical structures (ChemIDplus Advanced)

ChemIDplus also provides links to many biomedical resources at NLM and on the Internet for chemicals of interest.

## Searching ChemIDplus

Search ChemIDplus by name, synonym, Chemical Abstracts Service (CAS) registry number, molecular formula, classification code, locator code, structure, toxicity, and/or physical properties within two distinct applications:

- **ChemIDplus Lite** (ChemIDplus home page) is designed for simple searching on name or registry number to retrieve basic information about a chemical and provide locator links to other resources and does not require special software applets or plug-ins. The Lite version displays structures, but does not allow drawing or searching on structures.
- **ChemIDplus Advanced** (see below) is designed for more advanced searching on any combination of name, registry number, molecular formula, classification code, locator code, toxicity, physical property, structure, or molecular weight. In addition, ChemIDplus Advanced allows users to draw their own structures and perform similarity and substructure searches.

Enter basic search term

Qualify a toxicity search

Select and qualify a physical property

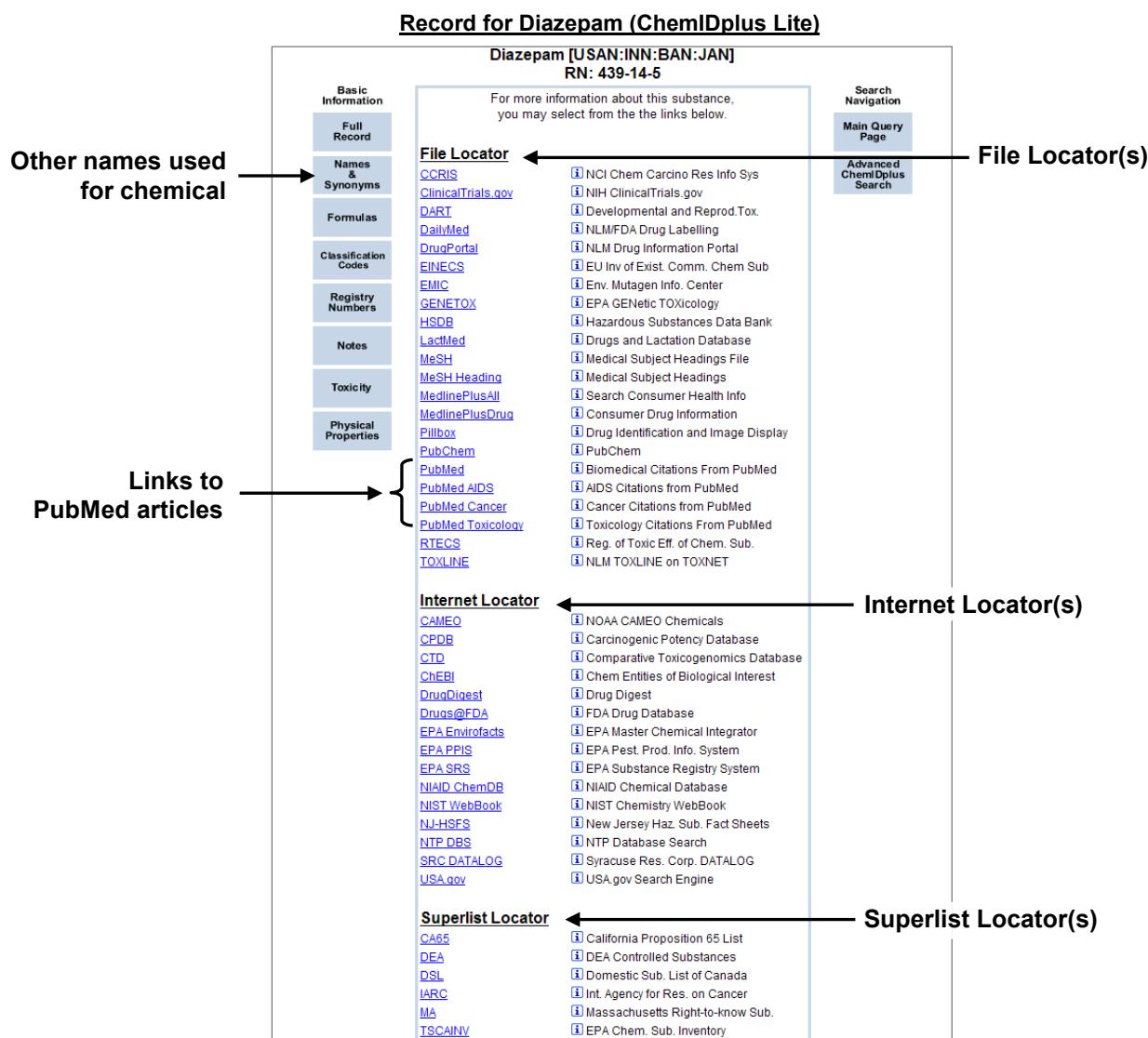
Click in box to draw structures

Select type of structure search

## Search Results

If you searched ChemIDplus Lite, the system displays the record with basic information for the chemical, including links to additional information. If multiple records were retrieved, a list of names would be shown. Following is the ChemIDplus Lite record for *diazepam*. Use buttons on the left to retrieve categories of detailed information such as Names & Synonyms, Formulas, Classification Codes, Registry Numbers, and Notes. In the center of the page, lists of “locators” provide links to other resources in three categories:

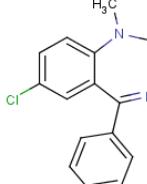
- **File Locators**—point to a set of NLM associated databases
- **Internet Locators**—point to a set of resources with biomedical data of interest for the chemical
- **SuperList Locators**—point to a set of regulatory and scientific lists that contain information about the chemical



The advanced record shows the same locator lists and basic information as the ChemIDplus Lite record with the addition of structures including structure navigation buttons.

**Record for Diazepam (ChemIDplus Advanced)**

NAME: Diazepam [USAN:INN:BAN:JAN]  
RN: 439-14-5

  
MW: 284.7447

[Enlarge Structure](#)

**Click to display structure** 

**Click to enlarge and manipulate structure** 

**Structure navigation buttons** 

Search Navigation

- [Start New Query](#)
- [Modify Query](#)
- [Show Query](#)
- [Search History](#)
- [Structure Similarity Search](#)
- [Structure Salt/Parent Search](#)
- [Transfer Structure](#)
- [Basic ChemIDplus Search](#)

**Basic Information**

- [Full Record](#)
- Structure**
- [Names & Synonyms](#)
- [Formulas](#)
- [Classification Codes](#)
- [Registry Numbers](#)
- [Notes](#)
- [Toxicity](#)
- [Physical Properties](#)

For more information about this substance, you may select from the the links below.

**File Locator**

- [NCI Chem Carcino Res Info Sys](#)
- [NIH ClinicalTrials.gov](#)
- [Developmental and Reprod.Tox.](#)
- [NLM/FDA Drug Labelling](#)
- [NLM Drug Information Portal](#)
- [EU Inv of Exist. Comm. Chem Sub](#)
- [Env. Mutagen Info. Center](#)
- [EPA GENetic TOXicology](#)
- [Hazardous Substances Data Bank](#)
- [Drugs and Lactation Database](#)
- [Medical Subject Headings File](#)
- [Medical Subject Headings](#)
- [Search Consumer Health Info](#)
- [Consumer Drug Information](#)
- [Drug Identification and Image Display](#)
- [PubChem](#)
- [Biomedical Citations From PubMed](#)
- [AIDS Citations from PubMed](#)
- [Cancer Citations from PubMed](#)
- [Toxicology Citations From PubMed](#)
- [Reg. of Toxic Eff. of Chem. Sub.](#)
- [NLM TOXLINE on TOXNET](#)

**Internet Locator**

- [CAMEO](#)
- [CPDB](#)
- [CTD](#)
- [ChEBI](#)
- [DrugDigest](#)
- [Drugs@FDA](#)
- [EPA Envirofacts](#)
- [EPA PPIs](#)
- [EPA SRS](#)
- [NIH ChemDB](#)
- [NIST WebBook](#)
- [NJ-HSFS](#)
- [NOAA CAMEO Chemicals](#)
- [Carcinogenic Potency Database](#)
- [Comparative Toxicogenomics Database](#)
- [Chem Entities of Biological Interest](#)
- [Drug Digest](#)
- [FDA Drug Database](#)
- [EPA Master Chemical Integrator](#)
- [EPA Pest. Prod. Info. System](#)
- [EPA Substance Registry System](#)
- [NIAID Chemical Database](#)
- [NIST Chemistry WebBook](#)
- [New Jersey Haz. Sub. Fact Sheets](#)

## Additional Resources

For further information, we recommend these additional resources:

- [ChemIDplus Fact Sheet](#)  
[www.nlm.nih.gov/pubs/factsheets/chemidplusfs.html](http://www.nlm.nih.gov/pubs/factsheets/chemidplusfs.html)
- [TOXNET Manual](#)  
[sis.nlm.nih.gov/enviro/manuals.html](http://sis.nlm.nih.gov/enviro/manuals.html)



## ChemIDplus Search Exercises

**Search Example:** Locate the record for **benzene**. See what other NLM databases contain information on **benzene**.

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **ChemIDplus** in the **Select Database** column
- ▶ Type **benzene** in the search box
- ▶ Click the **Search** button

The screenshot shows the TOXNET homepage with the following layout:

- Header:** United States National Library of Medicine, TOXNET Toxicology Data Network, Env. Health & Toxicology, TOXNET, ChemIDplus Lite.
- Left Sidebar:** Select Database (ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, ITR, IRIS, LactMed, Multi-Database, TR, Haz-Map, Household Products, TOXMAP, TOXNET Home, CPDB).
- Center:** Search ChemIDplus search box containing "benzene", Search and Clear buttons, Advanced ChemIDplus Search link, and a description: "Provides chemical structure, property, and toxicity searching.".
- Right Sidebar:** Env. Health & Toxicology (Portal to environmental health and toxicology resources), Support Pages (Help, Fact Sheet, Sample Record, TOXNET FAQ).

- ▶ Review the list of other NLM databases (under File Locator) that contain information on benzene
- ▶ Click the **Main Query Page** button at the right to prepare for a new search

The screenshot shows the ChemIDplus Lite homepage with the following layout:

- Header:** United States National Library of Medicine, ChemIDplus Lite, Env. Health & Toxicology, TOXNET, ChemIDplus Lite.
- Search Bar:** Search box containing "BENZENE", Search and Clear buttons.
- Result Area:** Benzene, RN: 71-43-2. For more information about this substance, you may select from the links below.
- File Locator:** A list of NLM databases including CCRIS, ClinicalTrials.gov, DART, DrugPortal, EINECS, EMIC, GENETOX, HSDB, Haz-Map, Household Products, IRIS, ITR, and Toxicity.
- Buttons:** Main Query Page (highlighted with a red box), ChemIDplus Search.

### Exercise 1: Find the lowest toxic dose tested (TDLo) for **phenobarbital** in infants.

Suggested solution:

- Type **phenobarbital** in the search box
- Click the **Search** button
- Click Phenobarbital [USAN:INN:JAN]
- Click the **Toxicity** button on the left of the page

Review	the chart and close the window
Click	the <b>Main Query Page</b> button at the right to prepare for a new search

**Exercise 2: Locate the record for *formaldehyde* and link to the Internet Locator ATSDR ToxFAQs. Then link to the NIOSH Pocket Guide. Use the Classification Code button to find the Overall Carcinogenic Evaluation classification and the source for the rating.**

Suggested solution:

Type	<b>formaldehyde</b> in the search box
Click	the <b>Search</b> button
Click	ATSDR ToxFAQs under <b>Internet Locator</b>
Review	the <b>ToxFAQs for Formaldehyde</b> in the ATSDR window and close the window
Click	NIOSH Pocket Guide under <b>Internet Locator</b>
Review	the information and close the CDC window
Click	the <b>Classification Codes</b> button on the left of the page
Review	the <b>Superlist Classification Code</b> list to find “Overall Carcinogenic Evaluation: Group 1”
Click	the information icon (i) next to “Overall Carcinogenic Evaluation: Group 1” to find the data source – IARC (International Agency for Research on Cancer)
Close	the Data Source Information window, then the Classification Codes window and return to the Formaldehyde [USAN] record
Click	the <b>Main Query Page</b> button at the top right to prepare for a new search

**Exercise 3: Using ChemIDplus Advanced to perform a structure similarity search on *methyl parathion*.**

Suggested Solution:

Click	the <b>Advanced ChemIDplus</b> Search button
Type	<b>methyl parathion</b> in the substance identification box
Click	the <b>Search</b> button
Click	the <b>Structure Similarity Search</b> button at the right
Review	the results
Click	the <b>TOXNET Home</b> button at the left of the page to prepare for the next search

# HSDB

HSDB is a comprehensive toxicology data file on the NLM TOXNET system. It contains data on over 5,000 chemicals, organized into individual records—the average record is approximately 25 printed pages. Content is peer-reviewed by the Scientific Review Panel, a committee of experts in the major subject areas within the data bank's scope. HSDB is enhanced with information on human exposure, industrial hygiene, emergency handling procedures, environmental fate, regulatory requirements, and related areas.

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

## Searching HSDB

Search HSDB by chemical or other name, chemical name fragment, Chemical Abstracts Service (CAS) Registry Number, and/or subject terms (basic searching). By default, the system searches for synonyms and CAS numbers of chemicals. Use truncation (\*), Boolean operators (AND, OR, NOT), phrase searching, nested parentheses, limits, and index browsing to refine your search results.

Click the **Limits** button on the home page to search

- Exact words, singular & plural forms, or word variants
- All the words, any of the words, or as a phrase
- In specific fields or categories of fields

Click the **Browse the Index** button on the home page to search a list of index terms related to the search term entered and the number of records containing that term. Select the record(s) you want to view by clicking the appropriate box in the “Check to Select” column and clicking the **Select** button. Scan the index above or below the original display by clicking the **Up** or **Down** button.

Check to Select	Number of Records	Index Term
<input type="checkbox"/>	1857	benzene
<input type="checkbox"/>	4	benzeneacetamide
<input type="checkbox"/>	7	benzeneacetate

## Search Results

Your initial retrieval is displayed as a list of substance names in blue and their CAS Registry Numbers. Substances are listed in **relevancy ranked order**. Relevancy ranking is based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms.

When searching for a chemical, the initial matching chemical record (the “primary record”) may be followed by additional chemical records that contain the chemical name or search term you entered.

1 <input type="checkbox"/>	BENZENE 71-43-2
2 <input type="checkbox"/>	HYDROQUINONE 123-31-9
3 <input type="checkbox"/>	TOLUENE 108-88-3

Click on a substance name on the search results screen to retrieve the record for that substance. The **Record** screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to **Other Files** (NLM databases), modify your search (**Modify Search**), **Download**, return to the **Basic Search** screen, and more.
2. A **Table of Contents** in the left frame allows you to choose categories and fields for display.
3. Chemical data is shown in the right frame. Your search term(s) appear(s) in red.

Record Screen

If you click the primary record, the system displays the **Human Health Effects**. If you click a different chemical record, or if your search was for a term other than a chemical, the system will display the sections of the record best matching your query terms (**Best Sections**), those where the chemical search term(s) appear(s) with greatest frequency.

## Additional Resources

For further information, we recommend these additional resources:

- [HSDB Skill Kit](http://www.nlm.nih.gov/pubs/techbull/ma07/ma07_hsdb_skill_kit.html)  
www.nlm.nih.gov/pubs/techbull/ma07/ma07\_hsdb\_skill\_kit.html
- [HSDB Animated Tutorial](http://sis.nlm.nih.gov/enviro/captivate/basicsearchinghsdb_skin.swf)  
sis.nlm.nih.gov/enviro/captivate/basicsearchinghsdb\_skin.swf

## HSDB Limits Search Fields

The Limits feature allows you to specify a particular field or category of fields to search. By default, the system will search all fields in all categories. To see all fields within a specific category, click the “+” beside that category.

**Search in fields:**  
(If no box is checked, all fields will be searched.)

Contract all categories   
 Expand all categories

**Contract/Expand All Categories**

**Search Fields in 16 Categories**

- Substance Identification**
- Human Health Effects**
- Emergency Medical Treatment**
- Animal Toxicity Studies**
- Metabolism/Pharmacokinetics**
- Pharmacology**
- Environmental Fate & Exposure**
- Environmental Standards & Regulations**
- Chemical/Physical Properties**
- Chemical Safety & Handling**
- Occupational Exposure Standards**
- Manufacturing/Use Information**
- Laboratory Methods**
- Special References**
- Synonyms and Identifiers**
- Administrative Information**

### Expanded Categories (All Fields)

- Substance Identification**
  - Chemical Names
  - CAS Registry Number
- Human Health Effects**
  - Toxicity Summary
  - Evidence for Carcinogenicity
  - Human Toxicity Excerpts
  - Human Toxicity Values
  - Skin, Eye and Respiratory Irritations
  - Drug Warnings
  - Medical Surveillance
  - Populations at Special Risk
  - Probable Routes of Human Exposure
  - Body Burden
  - Average Daily Intake
  - Minimum Fatal Dose Level
- Emergency Medical Treatment**
  - Emergency Medical Treatment
  - Antidote and Emergency Treatment
- Animal Toxicity Studies**
  - Toxicity Summary
  - Evidence for Carcinogenicity
- Metabolism/Pharmacokinetics**
  - Metabolism/Metabolites
  - Absorption, Distribution & Excretion
  - Biological Half-Life
  - Mechanism of Action
  - Interactions
- Pharmacology**
  - Therapeutic Uses
  - Drug Warnings
  - Interactions
  - Drug Idiosyncrasies
  - Drug Tolerance
  - Minimum Fatal Dose Level
  - Maximum Drug Dose
  - Bionecessity
- Non-Human Toxicity Excerpts**
- Ecotoxicity Excerpts**
- National Toxicology Program Studies**
- Non-Human Toxicity Values**
- Ecotoxicity Values**
- Ongoing Test Status**
- TSCA Test Submissions**

-  Environmental Fate & Exposure**
  - [Environmental Fate/Exposure Summary](#)
  - [Probable Routes of Human Exposure](#)
  - [Body Burden](#)
  - [Average Daily Intake](#)
  - [Natural Pollution Sources](#)
  - [Artificial Pollution Sources](#)
  - [Environmental Fate](#)
  - [Environmental Biodegradation](#)
  - [Environmental Abiotic Degradation](#)
  - [Environmental Bioconcentration](#)
  - [Soil Adsorption/Mobility](#)
  - [Volatilization from Water/Soil](#)
  - [Environmental Water Concentrations](#)
  - [Effluent Concentrations](#)
  - [Sediment/Soil Concentrations](#)
  - [Atmospheric Concentrations](#)
  - [Food Survey Values](#)
  - [Plant Concentrations](#)
  - [Fish/Seafood Concentrations](#)
  - [Animal Concentrations](#)
  - [Milk Concentrations](#)
  - [Other Environmental Concentrations](#)
-  Environmental Standards & Regulations**
  - [FIFRA Requirements](#)
  - [Acceptable Daily Intakes](#)
  - [TSCA Requirements](#)
  - [CERCLA Reportable Quantities](#)
  - [RCRA Requirements](#)
  - [Atmospheric Standards](#)
  - [Clean Water Act Requirements](#)
  - [Federal Drinking Water Standards](#)
  - [Federal Drinking Water Guidelines](#)
  - [State Drinking Water Standards](#)
  - [State Drinking Water Guidelines](#)
  - [Soil Standards](#)
  - [FDA Requirements](#)
  - [Allowable Tolerances](#)
-  Chemical/Physical Properties**
  - [Molecular Formula](#)
  - [Molecular Weight](#)
  - [Color/Form](#)
  - [Odor](#)
  - [Taste](#)
  - [Boiling Point](#)
  - [Melting Point](#)

- [Corrosivity](#)
- [Critical Temperature & Pressure](#)
- [Density/Specific Gravity](#)
- [Dissociation Constants](#)
- [Heat of Combustion](#)
- [Heat of Vaporization](#)
- [Octanol/Water Partition Coefficient](#)
- [pH](#)
- [Solubilities](#)
- [Spectral Properties](#)
- [Surface Tension](#)
- [Vapor Density](#)
- [Vapor Pressure](#)
- [Relative Evaporation Rate](#)
- [Viscosity](#)
- [Other Chemical/Physical Properties](#)

-  Chemical Safety & Handling**
  - [Hazards Summary](#)
  - [DOT Emergency Guidelines](#)
  - [Odor Threshold](#)
  - [Skin, Eye and Respiratory Irritations](#)
  - [Fire Potential](#)
  - [NFPA Hazard Classification](#)
  - [Flammable Limits](#)
  - [Flash Point](#)
  - [Autoignition Temperature](#)
  - [Fire Fighting Procedures](#)
  - [Toxic Combustion Products](#)
  - [Firefighting Hazards](#)
  - [Explosive Limits & Potential](#)
  - [Hazardous Reactivities & Incompatibilities](#)
  - [Hazardous Decomposition](#)
  - [Hazardous Polymerization](#)
  - [Other Hazardous Reaction](#)
  - [Prior History of Accidents](#)
  - [Immediately Dangerous to Life or Health](#)
  - [Protective Equipment & Clothing](#)
  - [Preventive Measures](#)
  - [Stability/Shelf Life](#)
  - [Shipment Methods and Regulations](#)
  - [Storage Conditions](#)
  - [Cleanup Methods](#)
  - [Disposal Methods](#)
  - [Radiation Limits & Potential](#)

 **Occupational Exposure Standards**

-  OSHA Standards
-  Threshold Limit Values
-  NIOSH Recommendations
-  Immediately Dangerous to Life or Health
-  Other Occupational Permissible Levels

 **Manufacturing/Use Information**

-  Major Uses
-  Manufacturers
-  Methods of Manufacturing
-  General Manufacturing Information
-  Formulations/Preparations
-  Impurities
-  Consumption Patterns
-  U. S. Production
-  U. S. Import
-  U. S. Exports

 **Laboratory Methods**

-  Clinical Laboratory Methods
-  Analytic Laboratory Methods
-  Sampling Procedures

 **Special References**

-  Special Reports

 **Synonyms and Identifiers**

-  Related HSDB Records
-  Synonyms
-  Associated Chemicals
-  Formulations/Preparations
-  Shipping Name/ Number
- DOT/UN/NA/IMO
-  Standard Transportation Number
-  EPA Hazardous Waste Number
-  Wiswesser Line Notation
-  RTECS Number

 **Administrative Information**

-  Hazardous Substances Databank Number
-  Last Review Date



## HSDB Search Exercises

### Search Example: Locate information on the human health effects of *Bisphenol A*.

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click HSDB in the **Select Database** column
- ▶ Type **bisphenol a** in the search box
- ▶ Click the **Search** button

- ▶ Click the primary record **BISPHENOL A**

- ▶ Review the **Human Health Effects** information in the right frame
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search

**Exercise 1: What current information is available on how *ethylene glycol* behaves in the environment based on the chemical's physical properties?**

Suggested Solution:

Type	<b>ethylene glycol</b> in the search box
Click	the <b>Search</b> button
Click	<b>ETHYLENE GLYCOL</b>
Scroll	down to the <u><b>Environmental Fate &amp; Exposure</b></u> section in the <b>Table of Contents</b>
Click	a subsection of your choice
Review	the information
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

**Exercise 2: What is the average daily intake of *mercury*?**

Suggested Solution:

Type	<b>mercury</b> in the search box
Click	the <b>Search</b> button
Click	<b>MECURY, ELEMENTAL</b>
Click	<u>Average Daily Intake</u> under <u><b>Human Health Effects</b></u> in the <b>Table of Contents</b>
Review	the information retrieved
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

**Exercise 3: Using the CAS Registry Number 7439-95-4, find the FDA requirements of this chemical.**

Suggested Solution:

Type	<b>7439-95-4</b> in the search box
Click	the <b>Search</b> box
Click	<b>MAGNESIUM ELEMENTAL</b> - the primary record
Scroll	down to the <u><b>Environmental Standards &amp; Regulations</b></u> section in the <b>Table of Contents</b>
Click	<u><b>FDA Requirements</b></u>
Review	the information
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

**Exercise 4: Using the limits feature, locate how many pesticide chemicals records contain average daily intake information.**

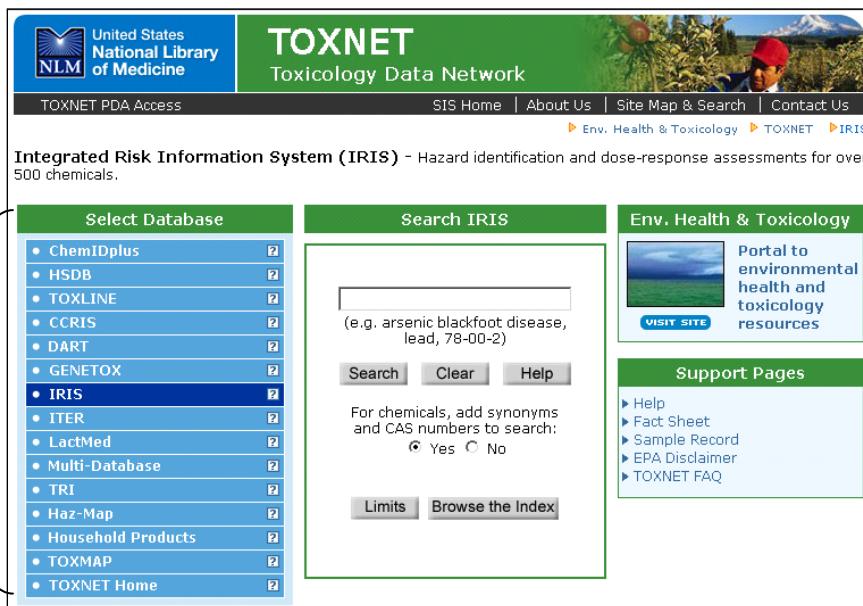
Suggested Solution:

- Click the **Limits** button at the bottom of the Search HSDB frame
- Click the “+” icon to expand the **Human Health Effects** category
- Click to check the box next to Average Daily Intake
- Type **pesticide** in the search box
- Select “exact words” and “the phrase” below the search box
- Click the **Search** button
- Review the list of chemicals
- Click the **TOXNET Home** button at the top of the page to prepare for the next search

# IRIS

The **Integrated Risk Information System (IRIS)** contains data for over 600 chemicals, compiled by the Environmental Protection Agency (EPA), in support of human health risk assessment. Overall, IRIS focuses on the human health effects that may result from exposure to various substances found in the environment with data on hazard identification and dose-response assessments.

The TOXNET Databases



The screenshot shows the TOXNET home page with a green header bar. The header includes the NLM logo, the TOXNET logo, and a photograph of a person in a field. Below the header, there are links for SIS Home, About Us, Site Map & Search, and Contact Us. A breadcrumb navigation bar shows Env. Health & Toxicology > TOXNET > IRIS. The main content area is titled "Integrated Risk Information System (IRIS) - Hazard identification and dose-response assessments for over 500 chemicals." On the left, a sidebar titled "Select Database" lists various databases: ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITER, LactMed, Multi-Database, TRI, Haz-Map, Household Products, TOXMAP, and TOXNET Home. The "IRIS" link is highlighted with a blue box. The main search area has a search input field with placeholder text "(e.g. arsenic blackfoot disease, lead, 78-00-2)" and buttons for Search, Clear, and Help. Below the search input is a question "For chemicals, add synonyms and CAS numbers to search:" with radio buttons for Yes and No. At the bottom of the search area are "Limits" and "Browse the Index" buttons. To the right of the search area is a box titled "Env. Health & Toxicology" with a "Portal to environmental health and toxicology resources" link and a "VISIT SITE" button. Below this is a "Support Pages" box with links to Help, Fact Sheet, Sample Record, EPA Disclaimer, and TOXNET FAQ.

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

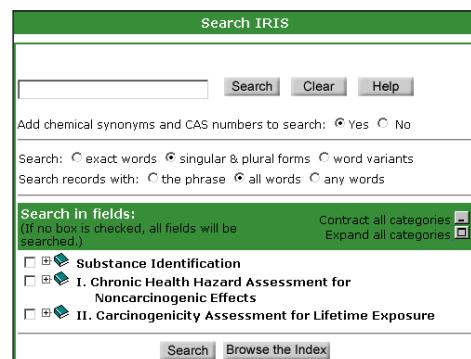
IRIS data are reviewed by work groups of EPA scientists and represent EPA consensus. Key data provided in IRIS include EPA carcinogen classifications, unit risks, slope factors, oral reference doses, and inhalation reference concentrations.

## Searching IRIS

Search IRIS by chemical or other name, chemical name fragment, Chemical Abstracts Service (CAS) Registry Number (RN), and/or subject terms. Search results, displayed in relevancy ranked order, can easily be viewed, printed, or downloaded.

Use truncation (\*), Boolean operators (AND, OR, NOT), phrase searching, nested parentheses, limits, and index browsing to refine your search results.

Click the **Limits** button on the home page to search:



The screenshot shows the expanded search interface. The search input field is present, along with "Search", "Clear", and "Help" buttons. Below the input field is a question "Add chemical synonyms and CAS numbers to search:" with radio buttons for Yes and No. The "Search" section includes options for "exact words", "singular & plural forms", "word variants", "phrase", "all words", and "any words". The "Search in fields" section contains a note "(If no box is checked, all fields will be searched.)" and checkboxes for "Substance Identification", "I. Chronic Health Hazard Assessment for Noncarcinogenic Effects", and "II. Carcinogenicity Assessment for Lifetime Exposure". At the bottom are "Search" and "Browse the Index" buttons.

- ▶ Exact words, singular & plural forms, or word variants
- ▶ Records with the phrase, all words, or any words
- ▶ In specific fields or categories of fields—Click the plus sign (+) to the left of a category to show all fields in that category. Use the (-) and (□) buttons above and to the right of the list of categories to contract or expand all categories.

With the **Browse the Index** feature, the system returns a list of index terms related to the search term entered. Select one or more index terms and click the **Select** button for the search results.

Check to Select	Number of Records	Index Term
<input type="checkbox"/>	6	arsenic
<input type="checkbox"/>	1	arsenic*
<input type="checkbox"/>	1	arsenical
<input type="checkbox"/>	1	arsenicism
<input type="checkbox"/>	1	arsenite

## Search Results

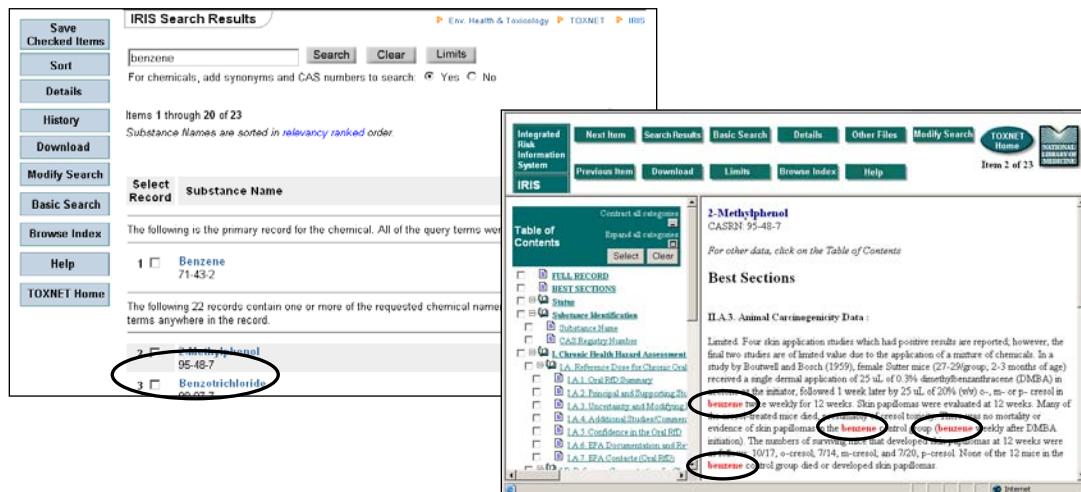
Search results are relevancy ranked. Relevancy ranking is based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms.

The search results screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to **Other Files** (NLM databases), **Modify Search**, **Download**, return to the **Basic Search** screen, and more.
2. A **Table of Contents** in the left frame allows you to choose categories and fields for display.
3. Chemical Data is shown in the right frame.

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	on-line	04/17/2003
Inhalation RfC Assessment (I.B.)	on-line	04/17/2003
Carcinogenicity Assessment (II)	on-line	01/19/2000

When searching for a chemical, your retrieval may include other chemical records in addition to the initial matching chemical record (the “primary” record). These additional records appear if they contain the chemical name or search term. Click any of these non-primary chemicals on the Search Results screen to display the Best Sections, those where the chemical search term(s) appear(s) with greatest frequency. The term(s) searched appear(s) in red.



The screenshot shows the IRIS Search Results page for the search term "benzene". The left sidebar contains buttons for Save Checked Items, Sort, Details, History, Download, Modify Search, Basic Search, Browse Index, and TOXNET Home. The main search bar shows "benzene" with "Search", "Clear", and "Limits" buttons. Below the search bar, a note says "For chemicals, add synonyms and CAS numbers to search:  Yes  No". The results list shows "Items 1 through 20 of 23" and "Substance Names are sorted in relevance ranked order". The first result is "Benzene 71-43-2". Below this, a note says "The following is the primary record for the chemical. All of the query terms were found in this record." The second result is "2-Methylphenol 95-48-7", and the third result is "Benzotrichloride 60-07-3". The right side of the screen shows the detailed view for "2-Methylphenol". The top navigation bar for this view includes "Env. Health & Toxicology", "TOXNET", "IRIS", "Next Item", "Search Results", "Basic Search", "Details", "Other Files", "Modify Search", "TOXNET Home", and "NATIONAL LIBRARY OF MEDICINE". The page title is "2-Methylphenol" with CASRN 95-48-7. It includes a "Table of Contents" sidebar with categories like "SELECT RECORD", "BEST SECTIONS", "STATE", "SUBSTANCE IDENTIFICATION", and "I. CHRONIC HEALTH HAZARD ASSESSMENT". The main content area shows "II.A.3. ANIMAL CARCINOGENICITY DATA" with a detailed description of a study by Boutsell and Borch (1959) involving mice. The word "benzene" appears in red text within the text of the study description.

## Additional Resources

For further information, we recommend these additional resources:

- ▶ **IRIS Fact Sheet:**  
[www.nlm.nih.gov/pubs/factsheets/irisfs.html](http://www.nlm.nih.gov/pubs/factsheets/irisfs.html)
- ▶ **EPA IRIS Web Site:**  
[epa.gov/NCEA/iris](http://epa.gov/NCEA/iris)



# IRIS Search Exercises

## Search Example: Locate the full record for **selenium**.

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **IRIS** in the **Select Database** column
- ▶ Type **selenium** in the search box
- ▶ Click the **Search** button

The screenshot shows the TOXNET homepage with the 'TOXNET PDA Access' logo. The main search area is titled 'Search IRIS' with a search box containing 'selenium'. Below the search box are buttons for 'Search', 'Clear', and 'Help'. A note says 'For chemicals, add synonyms and CAS numbers to search: Yes  No'. To the left is a 'Select Database' sidebar with options like ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS (which is selected), ITER, LactMed, Multi-Database, TRI, Haz-Map, and Household Products. To the right are links for 'Env. Health & Toxicology' (with a 'VISIT SITE' button) and 'Support Pages' (Help, Fact Sheet, Sample Record, EPA Disclaimer, TOXNET FAQ).

- ▶ Click **Selenium and Compounds**

The screenshot shows the 'IRIS Search Results' page. The search box contains 'selenium'. The results table shows one item: '1  Selenium and Compounds 7782-49-2'. This row is highlighted with a red box. Below the table, it says 'The following 4 records contain one or more of the requested chemical name(s) and all of the query terms anywhere in the record.' The second item is '2  Selenious acid 7732-00-0'.

- ▶ Click **FULL RECORD** in the **Table of Contents**

The screenshot shows the 'Selenium and Compounds' full record page. The table of contents on the left includes 'FULL RECORD', 'BEST SECTIONS', 'Status', 'Substance Identification', 'Chronic Health Hazard Assessment for', 'Reference Dose for Chronic Oral RD', 'Principal and Supporting Study', 'Uncertainty and Identifying Factors', 'Additional Studies/Comments', 'Confidence in the Oral RD', 'EPA Documentation and Review', 'EPA Contacts (Oral RD)', 'Reference Concentration for Chronic', 'Carcinogenicity Assessment for Life', and 'Evidence for Human Carcinogenicity'. The main content area discusses the essentiality of selenium and its role as a cofactor for glutathione peroxidase. It also notes its use in China for children and women of child-bearing age and its use in patients receiving parenteral feeding.

- ▶ Review the information in the right frame
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search

**Selenium and Compounds**  
CASRN: 7782-49-2

For other data, click on the Table of Contents

**Status:**

STATUS OF DATA FOR Selenium and Compounds

File First On-Line 03/01/1991

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	on-line	09/01/1991
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	on-line	07/01/1993

**Substance Identification:**

Substance Name:  
**Selenium and Compounds**

### Exercise 1: How does the U.S. Environmental Protection Agency characterize the carcinogenicity of *methylmercury*?

Suggested Solution:

Type	<b>methylmercury</b> in the search box
Click	the <b>Search</b> button
Click	Methylmercury (MeHg)
Click	<b>II.A. Evidence for Human Carcinogenicity under <u>Carcinogenicity Assessment for Lifetime Exposure</u></b> in the Table of Contents
Review	the information in the right frame
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

### Exercise 2: What is the Inhalation Reference Concentration (RfC) of *ammonia*? (Note: The RFC is a non-carcinogenic risk assessment parameter) Also, view the Download options available.

Suggested Solution:

Type	<b>ammonia</b> in the search box
Click	the <b>Search</b> button
Click	<b>Ammonia</b>
Click	the  icon to expand the <b>Chronic Health Hazard Assessment for Noncarcinogenic Effects</b> category in the Table of Contents
Click	<b>II.B. Reference Concentration for Chronic Inhalation Exposure (RfC)</b>
Review	the information in the right frame

- Click the **Download** button at the top of the page
- Review the Custom Formats
- Close the pop-up window
- Click the **TOXNET Home** button to prepare for a new session

This page is intentionally blank.

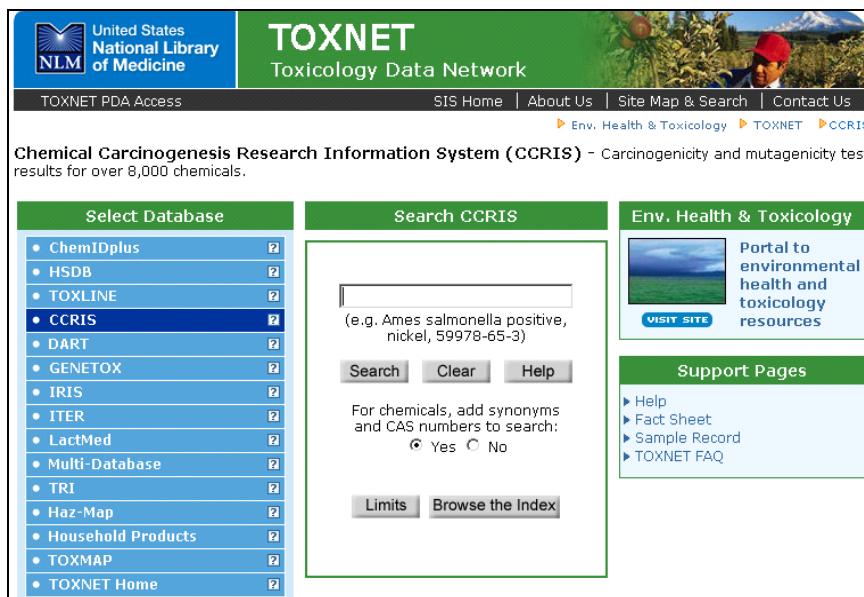
# CCRIS, GENE-TOX, and ITER





## CCRIS

**CCRIS** (Chemical Carcinogenesis Research Information System) is a toxicology data file of the NLM's TOXNET®. It is a scientifically evaluated and fully referenced data bank, developed and maintained by the National Cancer Institute (NCI). It contains over 9,000 chemical records with carcinogenicity, mutagenicity, tumor promotion, and tumor inhibition test results. Data are derived from studies cited in primary journals, current awareness tools, NCI reports, and other special sources. Test results have been reviewed by experts in carcinogenesis and mutagenesis.



The screenshot shows the TOXNET home page with the following layout:

- Header:** United States National Library of Medicine logo, TOXNET Toxicology Data Network logo, and a photo of a person in a field.
- Top Navigation:** TOXNET PDA Access, SIS Home, About Us, Site Map & Search, Contact Us, Env. Health & Toxicology, TOXNET, and CCRIS.
- Middle Content:**
  - Select Database:** A list of databases including ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITR, LactMed, Multi-Database, TRI, Haz-Map, Household Products, TOXMAP, and TOXNET Home.
  - Search CCRIS:** A search form with a text input field containing "(e.g. Ames salmonella positive, nickel, 59978-65-3)", a "Search" button, a "Clear" button, and a "Help" button. Below the input field is a note: "For chemicals, add synonyms and CAS numbers to search:  Yes  No".
  - Env. Health & Toxicology:** A box with a thumbnail image of a landscape, a "VISIT SITE" button, and the text: "Portal to environmental health and toxicology resources".
  - Support Pages:** A list including Help, Fact Sheet, Sample Record, and TOXNET FAQ.

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

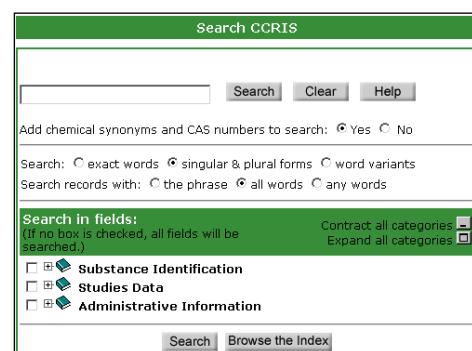
### Searching CCRIS

Search CCRIS by any combination of words, chemical names, and numbers, including Chemical Abstracts Service (CAS) Registry Numbers (RN). By default, the system adds synonyms and CAS numbers to chemical searches.

Use truncation (\*), Boolean operators (AND, OR, NOT), nested parentheses, limits, and index browsing to refine your search results.

Click the **Limits** button on the home page to search:

- Exact words, singular & plural forms, or word variants
- Records with the phrase, all words, or any words
- In specific fields or categories of fields—Click the plus sign (+) to the left of a category to show all fields in that category. Use the (-) and (□) buttons above and to the right of the list of categories to contract or expand all categories.



The screenshot shows the TOXNET search interface with the following expanded search options:

- Search CCRIS:** A search form with a text input field and "Search", "Clear", and "Help" buttons.
- Search Parameters:** "Add chemical synonyms and CAS numbers to search:  Yes  No".
- Search Options:** "Search:  exact words  singular & plural forms  word variants".
- Search Records:** "Search records with:  the phrase  all words  any words".
- Search in fields:** "If no box is checked, all fields will be searched." with checkboxes for Substance Identification, Studies Data, and Administrative Information.
- Contract/Expand:** "Contract all categories" and "Expand all categories".
- Buttons:** "Search" and "Browse the Index".

With the **Browse the Index** feature, the system returns a list of index terms related to the search term entered and the number of records containing that term. Select one or more index terms in the **Check to Select** column and click the **Select** button for the search results. Scan the index above or below the original display by clicking the **Up** or **Down** button.

Check to Select	Number of Records	Index Term
<input type="checkbox"/>	3	chloroform
<input type="checkbox"/>	2	chloroformate
<input type="checkbox"/>	1	chlorogenic
<input type="checkbox"/>	1	chloroisopropyl

## CCRIS Search Results

Your initial retrieval is displayed as a list of substance names in blue and their CAS Registry Numbers.

Substances are listed in **relevancy ranked order**—based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms. Click the substance name to retrieve the record for that substance.

The **Record** screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to **Other Files** (NLM databases), **Modify Search**, **Download**, return to the **Basic Search** screen, and more.
2. A **Table of Contents** in the left frame allows you to choose categories and fields for display.

3. Chemical Data is shown in the right frame.

When searching for a chemical, your retrieval may include other chemical records in addition to the initial matching chemical record (the “primary” record). These additional records appear if they contain the chemical name or search term. Click any of these non-primary chemicals on the **Search Results** screen to display the sections of the record best matching your query term(s) (**Best Sections**), those where the chemical search term(s) appears with greatest frequency. The term(s) searched appear(s) in red.

## Additional Resources

For further information, we recommend these additional resources:

- ▶ CCRIS Fact Sheet:  
[www.nlm.nih.gov/pubs/factsheets/ccrisfs.html](http://www.nlm.nih.gov/pubs/factsheets/ccrisfs.html)



## CCRIS Search Exercises

**Search Example:** Locate the record for **ethanol** and review the carcinogenicity studies.

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **CCRIS** in the **Select Database** column
- ▶ Type **ethanol** in the search box
- ▶ Click the **Search** button

- ▶ Click **ETHANOL**

- ▶ Click Carcinogenicity Studies under Studies Data in the Table of Contents

- ▶ Review the information retrieved in the right frame
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search

### Exercise 1: Does the record for **chromium** contain any positive mutagenicity studies?

Suggested Solution:

Type	<b>chromium</b> in the search box
Click	the <b>Search</b> button
Click	<b>CHROMIUM COMPOUNDS</b>
Click	<u>Mutagenicity Studies</u> under <u>Studies Data</u> in the <b>Table of Contents</b>
Review	the information in the right frame
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

### Exercise 2: Locate the record for **asbestos** and view the other files available.

Suggested Solution:

Type	<b>asbestos</b> in the search box
Click	the <b>Search</b> button
Click	<b>ASBESTOS</b>
Click	the <b>Other Files</b> button at the top of the page
Review	other database sources
Close	the pop-up window
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

### Exercise 3: How many substances are identified in CCRIS as positive for brain cancer?

Suggested Solution:

Type	<b>positive brain cancer</b> in the search box
Click	the <b>Search</b> button
Click	chemical record(s) of your choice
Review	the information in the right frame
Click	the <b>TOXNET Home</b> button at the top right of the page to prepare for a new session

## GENE-TOX

**GENE-TOX** is a toxicology data file of the National Library of Medicine's Toxicology Data Network (TOXNET®). It is created by the U.S. Environmental Protection Agency and contains genetic toxicology (mutagenicity) test data, resulting from expert peer review of the open scientific literature, on over 3,000 chemicals. The GENE-TOX program was established to select assay systems for evaluation, review data in the scientific literature, and recommend proper testing protocols and evaluation procedures for these systems.

 Yes  No'. To the right, there is a 'Env. Health & Toxicology' sidebar with a 'Portal to environmental health and toxicology resources' section and a 'Support Pages' section with links to Help, Fact Sheet, Sample Record, and TOXNET FAQ. At the bottom, there are 'Limits' and 'Browse the Index' buttons."/>

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

### Searching GENE-TOX

Search GENE-TOX by chemical or other name, chemical name fragment, Chemical Abstracts Service (CAS) Registry Number, and/or subject terms. By default, the system adds synonyms and CAS numbers to chemical searches.

Use truncation (\*), Boolean operators (AND, OR, NOT), nested parentheses, limits, and index browsing to refine your search results.

Click the **Limits** button on the home page to search:

- ▶ Exact words, singular & plural forms, or word variants
- ▶ Records with the phrase, all words, or any words
- ▶ In specific fields or categories of fields—Click the plus sign (+) to the left of a category to show all fields in that category. Use the (-) and (□) buttons above and to the right of the list of categories to contract or expand all categories.

 Yes  No'. Underneath, there are search options: 'Search:  exact words  singular & plural forms  word variants' and 'Search records with:  the phrase  all words  any words'. A 'Search in fields:' section includes a note '(If no box is checked, all fields will be searched.)' and checkboxes for 'Substance Identification', 'Mutagenicity Studies', and 'Administrative Information'. To the right, there are buttons to 'Contract all categories' and 'Expand all categories'. At the bottom, there are 'Search' and 'Browse the Index' buttons."/>

With the **Browse the Index** feature, the system returns a list of index terms related to the search term entered and the number of records containing that term. Select one or more index terms and click the **Select** button for the search results. Scan the index above or below the original display by clicking the **Up** or **Down** button.

## GENE-TOX Search Results

Your initial retrieval is displayed as a list of substance names in blue and their CAS Registry Numbers. Substances are listed in relevancy ranked order. Relevancy ranking is based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms.

The **Record** screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to **Other Files** (NLM databases), **Modify Search**, **Download**, return to the **Basic Search** screen, and more.
2. A **Table of Contents** in the left frame allows you to choose categories and fields for display.
3. Chemical Data is shown in the right frame.

When searching for a chemical, your retrieval may include other chemical records in addition to the initial matching chemical record (the “primary” record). These additional records appear if they contain the chemical name or search term. Click any of these non-primary chemicals on the **Search Results** screen to display the sections of the record best matching your query term(s) (**Best Sections**), those where the chemical search term(s) appear(s) with greatest frequency.

Search term(s) appear(s) in red:

The screenshot shows the GENE-TOX Search Results page. The search term 'benzene' is entered in the search bar. The results list shows 1 through 20 of 352 items. The first result is 'BENZENE' (71-43-2). The second result is 'RESERPINE' (50-55-5), which is circled in red. The third result is 'NIALAMID' (51-12-7). The right panel displays the 'RESERPINE' record, which includes the CASRN: 50-55-5. Below the record, under 'Best Sections', is a list of categories. The 'Benzene' category is also circled in red.

## Additional Resources

For further information, we recommend these additional resources:

- **GENE-TOX Fact Sheet:**  
[www.nlm.nih.gov/pubs/factsheets/genetxfs.html](http://www.nlm.nih.gov/pubs/factsheets/genetxfs.html)



## GENE-TOX Search Exercises

**Search Example: Using the CAS registry number 100-42-5, locate the full record for this chemical.**

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **GENETOX** in the **Select Database** column
- ▶ Type **100-42-5** in the search box
- ▶ Click the **Search** button

TOXNET  
Toxicology Data Network

Genetic Toxicology Data Bank (GENE-TOX) - Peer-reviewed genetic toxicology test data for over 3,000 chemicals.

Search GENETOX

100-42-5  
(e.g. micronucleus positive styrene, calcium chloride, 139-06-0)

Search | Clear | Help | Limits | Browse the Index

For chemicals, add synonyms and CAS numbers to search:  
Yes  No

Support Pages

Help | Fact Sheet | Sample Record | TOXNET FAQ

- ▶ Click **STYRENE**

TOXNET  
Toxicology Data Network

GENE-TOX Search Results

100-42-5 | Search | Clear | Limits |  
For chemicals, add synonyms and CAS numbers to search: Yes  No

Items 1 through 5 of 5  
Substance Names are sorted in [relevancy ranked](#) order.

Select Record Substance Name

The following is the primary record for the chemical. All of the query terms were found.

1  STYRENE  
100-42-5

The following 4 records contain one or more of the requested chemical name(s) and all of the query terms anywhere in the record.

2  ALPHA-METHYL STYRENE  
98-83-9  
3  M-METHYL-STYRENE

- ▶ Click **FULL RECORD** under the **Table of Contents**

TOXNET  
Toxicology Data Network

GENE-TOX

Table of Contents

Contract all categories | Expand all categories | Select | Clear

FULL RECORD

**STYRENE**  
CASRN: 100-42-5  
For other data, click on the Table of Contents

**Substance Identification:**

**Substance Name:** STYRENE  
**CAS Registry Number:** 100-42-5  
**Chemical Classification Category:** Benzene ring

**Taxonomic Name & Assay:**  
Prokaryotes - gene mutation  
Lower eukaryotes - gene mutation  
Insects - gene mutation  
In vitro mammalian - gene mutation  
Plants - chromosome effects

- ▶ Review the information in the right frame
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search

The screenshot shows the GENE-TOX Search Results page for the substance 'STYRENE'. The 'Basic Search' button is highlighted with a red box. The page displays the substance identification for STYRENE (CASRN: 100-42-5) and a table of contents. The 'Mutagenicity Studies' section is listed in the table of contents.

### Exercise 1: Are there any mutagenicity study panel reports for xylene?

Suggested Solution:

Type	<b>xylene</b> in the search box
Click	the <b>Search</b> button
Click	<b>XYLENE</b>
Click	<b>Mutagenicity Studies</b> in the <b>Table of Contents</b>
Review	the information in the right frame
Click	the link for the <b>Panel Report</b> of your choice to view the abstract
Review	the abstract in TOXLINE
Click	the browser's <b>Back</b> button to return to the GENE-TOX results page
Click	the <b>Basic Search</b> button at the top right of the page to prepare for the next session

### Exercise 2: Has cyclophosphamide been studied for effects on human male fertility and sterility?

Suggested Solution:

Type	<b>cyclophosphamide human male fertility</b> in the search box
Click	the <b>Search</b> button
Click	<b>CYCLOPHOSPHAMIDE</b>
Review	the <b>Best Sections</b> information in the right frame
Click	the <b>TOXNET Home</b> button at the top right of the page to prepare for the next session

# ITER

**ITER** (International Toxicity Estimates for Risk) is a toxicology data file on the National Library of Medicine's (NLM) Toxicology Data Network (TOXNET®) and contains data in support of human health risk assessments. Compiled by Toxicology Excellence for Risk Assessment, ITER is a small database with data on over 600 chemical records. It is structured to provide a comparison of international risk assessment information in a side-by-side format and explains differences in risk values derived by different organizations.

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

ITER provides both risk data and cancer classifications. Information is derived from:

- ▶ Agency for Toxic Substances & Disease Registry (ATSDR)
- ▶ Health Canada
- ▶ U.S. Environmental Protection Agency (EPA)
- ▶ International Agency for Research on Cancer (IARC)
- ▶ NSF International (National Sanitation Foundation)
- ▶ National Institute of Public Health & the Environmental (RIVM), The Netherlands

## Searching ITER

Search ITER by chemical or other name, chemical name fragment, Chemical Abstracts Service (CAS) Registry Number, and/or subject terms. By default, the system adds synonyms and CAS numbers to chemical searches.

Use truncation (\*), Boolean operators (AND, OR, NOT), nested parentheses, limits, and index browsing to refine your search results.

Click the **Limits** button on the home page to search:

- ▶ Exact words, singular & plural forms, or word variants
- ▶ Records with the phrase, all words, or any words
- ▶ In specific fields or categories of fields—Click the plus sign (+) to the left of a category to show all fields in that category. Use the (-) and (□) buttons above and to the right of the list of categories to contract or expand all categories.

The screenshot shows the 'Search ITER' interface. At the top is a green header bar with the text 'Search ITER'. Below it is a search bar with a placeholder 'Add chemical synonyms and CAS numbers to search:'. To the right of the search bar are buttons for 'Search', 'Clear', and 'Help'. Below the search bar is a section for 'Search in fields' with radio buttons for 'exact words', 'singular & plural forms', 'word variants', and 'all the phrase', with 'exact words' selected. There are also buttons for 'Contract all categories' and 'Expand all categories'. Under 'Search in fields', there are two checkboxes: 'Substance Identification' (checked) and 'Risk Data'. At the bottom of the interface are 'Search' and 'Browse the Index' buttons.

With the **Browse the Index** feature, the system returns a list of index terms related to the search term entered and the number of records containing that term. Select one or more index terms and click the **Select** button for the search results. Scan the index above or below the original display by clicking the **Up** or **Down** button.

The screenshot shows two side-by-side interfaces. On the left is the 'Browse ITER' interface, which has a search bar with 'benzene' and a note '(e.g., vinyl chloride, liver cancer risk, 78-00-2)'. Below the search bar are radio buttons for 'All Words' (selected), 'CAS Registry Number', and 'Chemical Name'. At the bottom are 'Search', 'Clear', and 'Help' buttons, and a 'Return to Basic Search' link. On the right is the 'ITER Browse Results' interface, which shows a search bar with 'benzene', 'Search', 'Clear', and 'Return to Basic Search' buttons. Below the search bar is a note 'Check one or more text words. Then click on SELECT.' and a table header 'Start of Text Word Browse: benzene'. The table has columns 'Check to Select', 'Number of Records', and 'Index Term'. The data in the table is as follows:

Check to Select	Number of Records	Index Term
<input type="checkbox"/>	10	benzene
<input type="checkbox"/>	3	benzenediamine
<input type="checkbox"/>	1	benzenediamines
<input type="checkbox"/>	4	benzenes
<input type="checkbox"/>	1	benzidine
<input type="checkbox"/>	1	benzylbenzene

## ITER Search Results

Your initial retrieval is displayed as a list of substance names highlighted in blue and their CAS Registry Numbers. Substances are listed in relevancy ranked order. Relevancy ranking is based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms.

The **Record** screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to **Other Files** (NLM databases), **Modify Search**, **Download**, return to the **Basic Search** screen, and more.
2. A **Table of Contents** in the left frame allows you to choose categories and fields for display.
3. Chemical Data is shown in the right frame.

The screenshot shows the 'ITER' record screen. At the top is a navigation bar with buttons for 'Next Item', 'Search Results', 'Basic Search', 'Details', 'Other Files', 'Modify Search', 'Download', 'Limits', 'Browse Index', and 'Help'. The 'ITER' logo is on the left. The 'Table of Contents' on the left lists categories: 'FULL RECORD', 'BEST SECTION', 'Substance Identification/Summary Table', 'Data - Noncancer Oral', 'Data - Noncancer Skin', 'Data - Noncancer Inhalation', and 'Data - Cancer Inhalation'. The 'Substance Identification/Summary Table' on the right shows data for 'BENZENE' (CASRN: 71-43-2). It includes a note 'For other data, click on the Table of Contents' and a 'Substance Name: BENZENE' section with 'CAS Registry Number: 71-43-2'. Below this is a 'Risk Values - Summary Table' with columns for 'Risk Value Type', 'Organization', 'ATSDR', 'Health Canada', 'IARC', 'IRIS', 'ITER', 'IRIS Int'l', 'RIVM', and 'U.S.EPA'. The table includes rows for 'Noncancer - Oral', 'Cancer - Oral', 'Noncancer - Inhalation', and 'Cancer - Inhalation'. A note at the bottom right says '✓ = Chemical evaluated and ITER data online.'

When searching for a chemical, your retrieval may include other chemical records in addition to the initial matching chemical record (the “primary” record). These additional records appear if they

contain the chemical name or search term. Click any of these non-primary chemicals on the **Search Results** screen to display the sections of the record best matching your query terms (**Best Sections**), those where the chemical search term(s) appear(s) with greatest frequency. Search term(s) appear(s) in red.

## Additional Resources

For further information, we recommend these additional resources:

- ▶ [ITER Fact Sheet](http://www.nlm.nih.gov/pubs/factsheets/toxnetfs.html):  
[www.nlm.nih.gov/pubs/factsheets/toxnetfs.html](http://www.nlm.nih.gov/pubs/factsheets/toxnetfs.html)



# ITER Search Exercises

**Search Example: Locate noncancer oral risk data for the chemical *beryllium*.**

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **ITER** in the **Select Database** column
- ▶ Type **beryllium** in the search box
- ▶ Click the **Search** button

The screenshot shows the TOXNET homepage with the following layout:

- Header:** United States National Library of Medicine, TOXNET PDA Access, SIS Home, About Us, Site Map & Search, Contact Us, Env. Health & Toxicology, TOXNET, ITER.
- Section:** International Toxicity Estimates for Risk (ITER) - Risk information for over 600 chemicals from authoritative groups worldwide.
- Left Sidebar:** Select Database (ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITER, LactMed, Multi-Database, TRI, User-Man).
- Search ITER Section:** Search bar containing "beryllium" (e.g. vinyl chloride, liver cancer risk, 78-00-2), Search, Clear, Help buttons, and a checkbox for "For chemicals, add synonyms and CAS numbers to search: Yes (checked) No".
- Env. Health & Toxicology Section:** Portal to environmental health and toxicology resources, VISIT SITE button.
- Support Pages Section:** ITER Glossary, What's New, Risk Methods, More About ITER, Risk Assessment Links, Help, Fact Sheet.

- ▶ Click **BERYLLIUM AND COMPOUNDS**

The screenshot shows the TOXNET search results page for "beryllium".

- Header:** TOXNET, SIS Home, About Us, Site Map & Search, Contact Us, Env. Health & Toxicology, TOXNET, ITER.
- Search Results:** Search bar containing "beryllium", Search, Clear, Limits buttons, and a checkbox for "For chemicals, add synonyms and CAS numbers to search: Yes (checked) No".
- Table:**

1	<input checked="" type="checkbox"/> BERYLLIUM AND COMPOUNDS
	Synonym: beryllium 7440-41-7
- Text:** The following record contains one or more of the requested chemical name(s) and all of the query terms anywhere in the record.
- Table:**

2	<input type="checkbox"/> CADMIUM, INORGANIC
---	---

- ▶ Click **Noncancer Oral Risk Values Table** under **Data-Noncancer Oral** in the **Table of Contents**

The screenshot shows the TOXNET Table of Contents and the Noncancer Oral Risk Values Table for BERYLLIUM AND COMPOUNDS.

- Table of Contents:**
  - International Toxicity Estimates for Risk
  - ITER
  - Substance Name
  - CAS Registry Number
  - Risk Values - Summary Table
  - Data - Noncancer Oral** (highlighted with a red box)
  - Data - Noncancer Oral Risk Values Table** (highlighted with a red box)
  - Nonscancer Oral Synopsis
  - Nonscancer Oral Specifics
  - Data - Cancer Oral
  - Cancer Oral Risk Values Table
  - Cancer Oral Synopsis
  - Cancer Oral Specifics
  - Data - Noncancer Inhalation
  - Nonscancer Inhalation Risk Values Table
  - Nonscancer Inhalation Synopsis
  - Nonscancer Inhalation Specifics
  - Data - Cancer Inhalation
  - Cancer Inhalation Risk Values Table
  - Cancer Inhalation Synopsis
  - Cancer Inhalation Specifics
- Noncancer Oral Risk Values Table:**

ITER Noncancer Oral Risk Table for: BERYLLIUM AND COMPOUNDS

Risk Value Parameter\Organization	ATSDR <sup>1</sup>	Health Canada <sup>2</sup>	IARC <sup>3</sup>	IPRV <sup>4</sup>	ITER <sup>5</sup>	NSF Int'l <sup>6</sup>	RIVM <sup>7</sup>	U.S. EPA <sup>8</sup>
Risk Value Name	chronic MRL	--	--	--	--	--	--	RfD
Risk Value*	2E-3	--	--	--	--	--	--	2E-3
Year	2002	--	--	--	--	--	--	1998
Basis (Experimental)	BMDL10 0.56	--	--	--	--	--	--	BMD10 1
Basis (Adjusted)*	NA	--	--	--	--	--	--	NA

- ▶ Review the information in the right frame
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search.

**Exercise 1: Locate the record for *sulfur dioxide*. Do ATSDR and IARC have any risk data for oral cancer?**

Suggested Solution:

Type	<b>sulfur dioxide</b> in the search box
Click	the <b>Search</b> button
Click	<b>SULFUR DIOXIDE</b>
Click	<b>Data-Cancer Oral</b> in the <b>Table of Contents</b>
Review	the Data-Cancer Oral table in the right frame
Click	the <b>Basic Search</b> button at the top right of the page to prepare for the next search

**Exercise 2: How do the Dutch RIVM, Health Canada, and ATSDR compare in their evaluation of carcinogenicity data for *ethylene glycol*?**

Suggested Solution:

Type	<b>ethylene glycol</b> in the search box
Click	the <b>Search</b> button
Click	<b>ETHYLENE GLYCOL</b>
Click	<b>Data – Cancer Inhalation</b> in the <b>Table of Contents</b> to the left
Review	the Cancer Inhalation Table in the right frame
Scroll	down to review Cancer Inhalation Synopsis
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next search

# TRI and TOXMAP

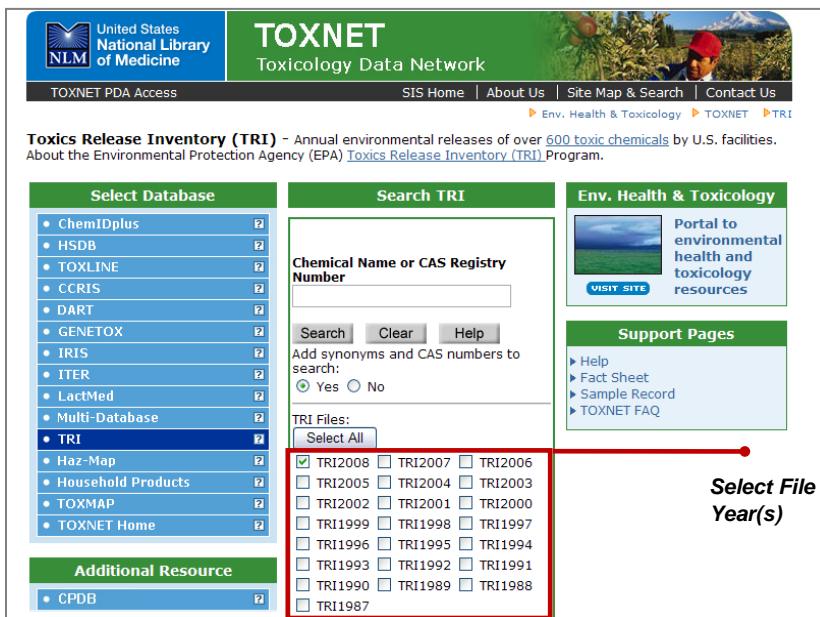


*The National Library of Medicine*  
*Web Resources for Environmental Health and Biomedical Research*



# Toxics Release Inventory

The Toxics Release Inventory (TRI) is a publicly available resource of the U.S. Environmental Protection Agency containing detailed information on approximately 650 chemicals and chemical categories, which over 23,000 U.S. industrial and federal facilities manage through disposal or other releases, recycling, energy recovery, or treatment. This inventory was established under the Emergency Planning and Community Right to Know Act of 1986 (EPCRA) and was expanded by the Pollution Prevention Act of 1990. TRI's data, beginning with the 1987 reporting year, cover air, water, land, and underground injection releases as well as transfers to waste sites.



toxnet.nlm.nih.gov

## Searching TRI

Search TRI by chemical or other name, chemical name fragment, Chemical Abstracts Service (CAS) Registry Number, and/or subject terms. By default, the system adds synonyms and CAS numbers to chemical searches. Use truncation (\*), Boolean operators (AND, OR, NOT), nested parentheses, and limits to refine your search results.

TRI currently contains data from 1987 through 2008. By default the system will search the most current year. You can also limit your search with the following criteria:

- ▶ Facility Name
- ▶ Facility Location
  - Select State, City/State, County/State, or Zip

<b>Facility Names</b> (Separate multiple entries with commas)
<b>Facility Location</b> (Separate multiple entries for state, city/state, or zip with commas. For example: NJ, DE, or Trenton/NJ, Houston/TX, or 21113, 21204)
<input checked="" type="radio"/> State <input type="radio"/> City/State <input type="radio"/> County/State <input type="radio"/> Zip
<b>TRI Reporting Form Type</b>
<input checked="" type="radio"/> Both Form R and Form A <input type="radio"/> Form R (long form) only <input type="radio"/> Form A (short form) only
<b>Standard Industrial Classification Code, North American Industry Classification System Code</b> (Separate multiple entries with commas)
<input type="button" value="Search"/> <input type="button" value="Browse the Index"/>

- ▶ Standard Industrial Classification Code or North American Industry Classification System Code
- ▶ Separate multiple entries with commas
- ▶ Weight in pounds (Great Than)
- ▶ Type of release (air, water, land, underground injection, or total environmental release)

With the Browse the Index feature, the system returns a list of index terms related to the search term entered and the number of records containing that term. Select one or more index terms and click the Select button for the search results. Scan the index above or below the original display by clicking the Up or Down button.

## Search Results

Your initial retrieval is displayed in relevancy ranked order as a list of abbreviated records with facility name in blue and hot-linked, chemical name, and city and state where the facility is located. Relevancy ranking is based on the number of individual search terms occurring in a document, the number of times each search term occurs in a document, the rarity of the search terms within the database, and the nearness of search terms to each other. Records containing combinations of search terms tend to be ranked higher than records with isolated occurrences of search terms.

The Record screen is organized into three sections:

1. Navigation buttons at the top of the screen allow you to link to Other Files (NLM databases), Modify Search, Download, return to the Basic Search screen, and more.
2. A Table of Contents in the left frame allows you to choose categories and fields for display.
3. Data is shown in the right frame—Click the Map it with TOXMAP button on the right to visually explore on-site releases in TOXMAP

## Additional Resources

For further information, we recommend these additional resource:

- ▶ [TRI Fact Sheet](#)  
[www.nlm.nih.gov/pubs/factsheets/trifs.html](http://www.nlm.nih.gov/pubs/factsheets/trifs.html)

# TOXMAP

**TOXMAP** is a Geographic Information System (GIS) that uses maps of the United States to help users visually explore data from the Environmental Protection Agency's Toxics Release Inventory (TRI) and Superfund programs. TOXMAP helps users create nationwide, regional, or local area maps showing where TRI chemicals are released on-site into the air, water, and ground. Maps can also show locations of Superfund sites on the National Priorities List (NPL). The NPL is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.

The screenshot shows the TOXMAP homepage. At the top, there is a navigation bar with links for Home, TRI Facilities, TRI Releases, TRI Trends, Superfund, Combo, Search, Help, and Contact Us. Below the navigation bar is a search bar with the placeholder "Find Toxic Releases & Hazardous Waste Sites Enter your ZIP:". To the left of the map is a "Quick Search" box with fields for "Select Dataset(s)" (with checkboxes for TRI and Superfund NPL selected), "Chemical Name", "City", "State", "ZIP [Lookup]", and "Search" and "Clear" buttons. Below this is a "Choose a region..." dropdown and a "More search options..." link. Further down are links for "Search TOXNET® TRI", "What is TOXMAP?", "What is the Toxic Release Inventory (TRI)?", and "What is the Superfund Program?". The main area features a map of the United States with numerous blue and red dots representing TRI facilities and Superfund NPL sites. A legend below the map states "TRI facilities (blue) and Superfund NPL sites (red)". To the right of the map are links for "Try the TOXMAP Widget", "Updated Superfund, NCI Mortality data", "Try the TOXMAP Toolbar", "Subscribe to TOXMAP news feed", and a section titled "Environmental News from EPA" with links to EPA news items.

## Map Features

TOXMAP offers several ways to create maps using the tabs and buttons along the top of the page, the **Quick Search** box on the home page, and the map controls below the map.

TOXMAP can create several types of maps:

- ▶ TRI Facilities
- ▶ TRI Chemical Releases
- ▶ TRI Chemical Trends
- ▶ Superfund Maps
- ▶ Combination (Combo) Maps

The screenshot shows the "MAP CONTROLS" section of the TOXMAP interface. It includes three main sections: "TRI", "Superfund", and "Demographic". The "TRI" section has radio buttons for "None", "Facilities", "Releases : 2006", and "Trends". The "Superfund" section has radio buttons for "None", "All NPL", "NPL Final", "NPL Deleted", "NPL Proposed", and "NPL Pending". The "Demographic" section has radio buttons for "None" and "Population Density - 2000". At the bottom are buttons for "Search chemical", "Define a combo map", and "Start over".

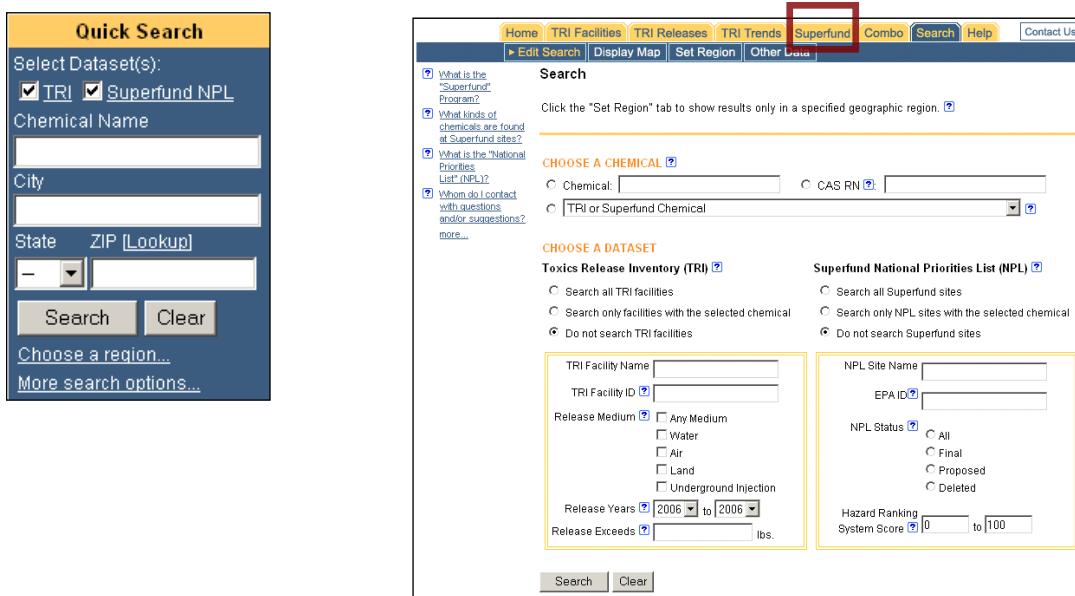
TOXMAP also overlays map data such as:

- ▶ U.S. Census Data—1990 and 2000 demographics (population, ethnicity, age, gender ratio)
- ▶ Income Data—per capita personal income
- ▶ Health Data—mortality data for cancer and various causes
- ▶ Reference Data—cities, roads, federal land, and urban areas

## Searching and Creating Maps in TOXMAP

TOXMAP's **Quick Search** feature on the home page allows you to search TRI and Superfund data by chemical and to zoom the resulting map to a specific city, state, or zip code. More advanced search options are available by clicking the More search options... link or by selecting the **Search** tab at the top of the page.

The **Search** tab page allows users to search a chemical CAS/RN, TRI facility name/ID, release year ranges, release amount, Superfund NPL site name/ID, and Hazard Ranking System (HRS) score.



The image shows two side-by-side screenshots of the TOXMAP search interface. The left screenshot is the 'Quick Search' page, which has fields for 'Chemical Name', 'City', 'State ZIP [Lookup]', and buttons for 'Search' and 'Clear'. The right screenshot is the 'Advanced Search' page, which includes tabs for 'Home', 'TRI Facilities', 'TRI Releases', 'TRI Trends', 'Superfund' (which is highlighted with a red box), 'Combo', 'Search', 'Help', and 'Contact Us'. The 'Superfund' tab page contains sections for 'Search', 'CHOOSE A CHEMICAL', 'CHOOSE A DATASET', and 'NPL Status'.

## Additional Resources

For further information, we recommend these additional resources:

- ▶ [Online Tutorial: TOXMAP Basics](#)  
toxmap.nlm.nih.gov/toxmap/tour/misc/ToxmapBasics.html
- ▶ [TOXMAP Tour](#)  
toxmap.nlm.nih.gov/toxmap/tour/index.html
- ▶ [TOXMAP Fact Sheet](#)  
www.nlm.nih.gov/pubs/factsheets/toxmap.html

## TRI/TOXMAP Decision Tree

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**TRI (Toxics Release Inventory)** is the Environmental Protection Agency's (EPA) publicly available database that contains information on toxic chemical releases and waste management activities, and more recently, source reduction and recycling information, reported annually by U.S. industrial and federal facilities beginning with the 1987 reporting year. TRI is accessible via the National Library of Medicine's (NLM) **TOXNET®** (TOXicology Data NETwork) databases, which cover toxicology, hazardous chemicals, environmental health and related areas.

**TOXMAP** is a geographic information system from the NLM's Division of Specialized Information Services that uses maps of the United States to help users visually explore data from the EPA's TRI and Superfund Program. With TOXMAP, users can create nationwide, regional, or local area maps showing where TRI chemicals are released on-site into the air, water, and ground. Information on the releasing facilities is provided. Maps can also show locations of Superfund sites, with listings of all chemical contaminants present at these sites.

**Use this Decision Tree to choose the correct database:**

TOXNET / TRI	TOXMAP
You want full-reference, book-style information on TRI facilities or releases	You are interested in a health-related presentation of TRI data
You are using other TOXNET resources	You want to see TRI locations on a map
You want to benefit from chemical synonyms	You are interested only in on-site chemical releases
You would like to use a browse interface	You want to search by combinations of states and/or counties
You want to calculate the total release of chemicals	You are also interested in Superfund sites and/or demographic data
You want the release mediums for air, water, underground injection, and land	You want location data from the Federal Registry System (not self-reported locations)



## TRI/TOXMAP Exercises

**Search Example: How many pounds of *ethylbenzene* were released to the environment in Jackson Mississippi between 2007-2008? Map the releases in TOXMAP and view the environmental release information for the first facility.**

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Select TRI from the column of databases
- ▶ Type **ethylbenzene** in the Chemical Name or CAS Registry Number search box
- ▶ Select the TRI years of 2007 and 2008
  - ➡ TRI2008 is selected by default

Toxics Release Inventory (TRI) - Annual environmental releases of over 600 toxic chemicals by U.S. facilities. About the Environmental Protection Agency (EPA) [Toxics Release Inventory \(TRI\) Program](#).

<b>Select Database</b> <ul style="list-style-type: none"> <li>• ChemIDplus</li> <li>• HSDB</li> <li>• TOXLINE</li> <li>• CCRIS</li> <li>• DART</li> <li>• GENETOX</li> <li>• IRIS</li> <li>• ITER</li> <li>• LactMed</li> <li>• Multi-Database</li> <li>• TRI</li> <li>• Haz-Map</li> <li>• Household Products</li> <li>• TOXMAP</li> <li>• TOXNET Home</li> </ul>	<b>Search TRI</b> <p>Chemical Name or CAS Registry Number ethylbenzene</p> <p>Search Clear Help Add synonyms and CAS numbers to search: Yes No</p> <p>TRI Files: Select All</p> <p><input checked="" type="checkbox"/> TRI2008 <input checked="" type="checkbox"/> TRI2007 <input type="checkbox"/> TRI2006  <input type="checkbox"/> TRI2005 <input type="checkbox"/> TRI2004 <input type="checkbox"/> TRI2003  <input type="checkbox"/> TRI2002 <input type="checkbox"/> TRI2001 <input type="checkbox"/> TRI2000  <input type="checkbox"/> TRI1999 <input type="checkbox"/> TRI1998 <input type="checkbox"/> TRI1997</p>	<b>Env. Health &amp; Toxicology</b> Portal to environmental health and toxicology resources <a href="#">VISIT SITE</a>
		<b>Support Pages</b> <ul style="list-style-type: none"> <li>▶ Help</li> <li>▶ Fact Sheet</li> <li>▶ Sample Record</li> <li>▶ TOXNET FAQ</li> </ul>

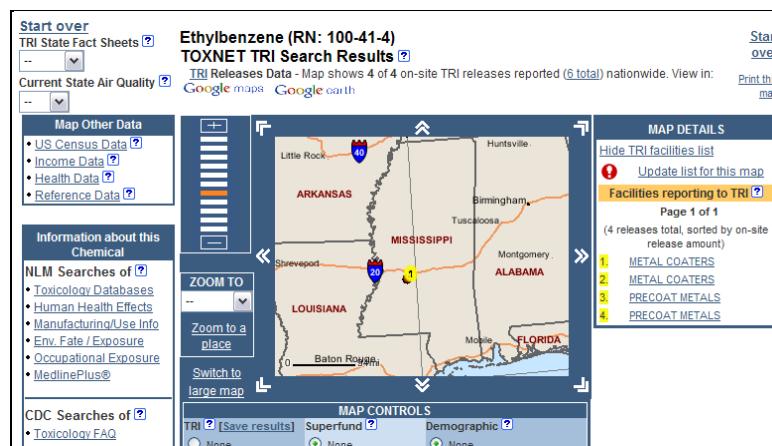
- ▶ Type **jackson/ms** in the Facility Location search box
- ▶ Select City/State under Facility Location search box
  - ➡ State is selected by default
- ▶ Click the **Search** button

<p>Facility Location (Separate multiple entries for state, city/state, or zip with commas. For example: NJ, DE, or Trenton/NJ, Houston/TX, or 21113, 21224.)</p> <p>jackson/ms</p> <p><input type="radio"/> State <input checked="" type="radio"/> City/State  <input type="radio"/> County/State <input type="radio"/> Zip</p> <p>TRI Reporting Form Type</p> <p><input checked="" type="radio"/> Both Form R and Form A  <input type="radio"/> Form R (long form) only  <input type="radio"/> Form A (short form) only</p> <p>Standard Industrial Classification Code, North American Industry Classification System Code (Separate multiple entries with commas)</p> <p>Greater Than <input type="text" value="0 lbs"/> for None Selected</p>
<input type="button" value="Search"/> <input type="button" value="Browse the Index"/>

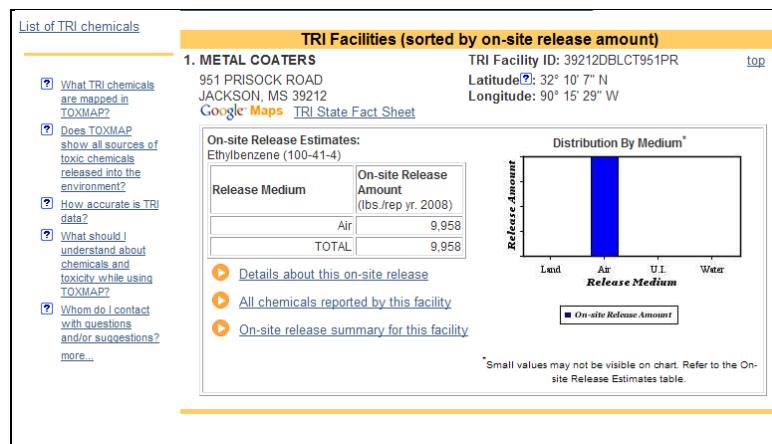
- ▶ Click the **Calculate Totals** button at the left of page
- ▶ Review the Environmental Release information for ethylbenzene
- ▶ Backspace to return to search results page

<input type="button" value="Calculate Totals"/> <input type="button" value="Save Checked Items"/> <input type="button" value="Sort"/> <input type="button" value="Details"/> <input type="button" value="History"/> <input type="button" value="Download"/> <input type="button" value="Modify Search"/> <input type="button" value="New Search"/> <input type="button" value="Browse Index"/>	<p><b>TRI Calculation Results</b></p> <table border="1"> <thead> <tr> <th>On Site Environmental Release (Form R)</th> <th>Pounds</th> </tr> </thead> <tbody> <tr> <td>Total Air Release</td> <td>22,974</td> </tr> <tr> <td>Total Water Release</td> <td>0</td> </tr> <tr> <td>Total Underground Injection Release</td> <td>0</td> </tr> <tr> <td>Total Land Release</td> <td>0</td> </tr> <tr> <td><b>Total Disposal (Environmental Release)</b></td> <td><b>22,974</b></td> </tr> <tr> <th>Off-Site Waste Transfer (Form R)</th> <th>Pounds</th> </tr> <tr> <td>Total Publicly Owned Treatment Works Transfer</td> <td>0</td> </tr> <tr> <td>Total Other Off-Site Locations Transfer</td> <td>180,621</td> </tr> <tr> <td><b>Total Off-Site Waste Transfer</b></td> <td><b>180,621</b></td> </tr> <tr> <td><b>Total Environmental Release and Off-Site Waste Transfer</b></td> <td><b>203,595</b></td> </tr> </tbody> </table> <p>There were also 2 <a href="#">Form A</a> submissions that accounted for up to 5,500 pounds of production-related waste. (Includes all on- and off-site releases, recycling, energy recovery, treatment for destruction, etc.)</p>	On Site Environmental Release (Form R)	Pounds	Total Air Release	22,974	Total Water Release	0	Total Underground Injection Release	0	Total Land Release	0	<b>Total Disposal (Environmental Release)</b>	<b>22,974</b>	Off-Site Waste Transfer (Form R)	Pounds	Total Publicly Owned Treatment Works Transfer	0	Total Other Off-Site Locations Transfer	180,621	<b>Total Off-Site Waste Transfer</b>	<b>180,621</b>	<b>Total Environmental Release and Off-Site Waste Transfer</b>	<b>203,595</b>
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<b>Total Off-Site Waste Transfer</b>	<b>180,621</b>																						
<b>Total Environmental Release and Off-Site Waste Transfer</b>	<b>203,595</b>																						

- ▶ Click the **Map it with TOXMAP** button
- ▶ Click MS from the **ZOOM TO** pull-down menu at the left of the map
- ▶ Click TRI on-site releases details at the right of the map below **MAP DETAILS**



- ▶ Click a facility name link under **Facilities reporting to TRI**
- ▶ Review the **Emissions Estimates and All chemicals reported by this facility**



## Exercise 2: Link to NLM's HSDB to explore the human health effects of ethylbenzene.

Suggested Solution (continued from demonstration exercise)

Scroll	to the top of the page and find Chemical Information section to the top left of the map
Click	<u>Human Health Effects</u> under <b>Information about this Chemical</b>
Review	the information in the HSDB Search Results window
Close	the HSDB window and return to the TOXMAP results page
Click	the <b>Home</b> tab
Click	the link to the Environmental Health and Toxicology Portal at the bottom of the page to prepare for the next session

# MEDLINE/PubMed, TOXLINE, and DART





## MEDLINE/PubMed

PubMed is a database developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine and is available free on the Web. PubMed provides access to **MEDLINE**, NLM's premier bibliographic database containing citations and author abstracts from approximately 5,400 biomedical journals published in the United States and worldwide. PubMed also provides access to citations for selected articles in life science journals not included in **MEDLINE** and additional relevant Web sites and links to molecular biology resources. The scope of PubMed includes such diverse topics as microbiology, delivery of health care, nutrition, pharmacology, and environmental health.

The screenshot shows the PubMed homepage with several labeled sections:

- NCBI Header:** Located at the top right, it includes links for "My NCBI" and "Sign In".
- Search Bar:** Located at the top left, it includes a "Search" dropdown set to "PubMed", a "Limits" link, an "Advanced search" link, and a "Help" link. The search input field is empty, and there are "Search" and "Clear" buttons.
- Tools & Resources:** A vertical column on the right side containing links to "MeSH Database", "Journals Database", "Clinical Trials", "E-Utilities", and "LinkOut".
- Links to NCBI Resources:** A vertical column on the right side containing links to "About NCBI", "Research at NCBI", "NCBI Newsletter", and "NCBI FTP Site".
- Using PubMed:** A section with links to "PubMed Quick Start Guide", "Full Text Articles", "PubMed FAQs", "PubMed Tutorials", and "New and Noteworthy".
- PubMed Tools:** A section with links to "Single Citation Matcher", "Batch Citation Matcher", "Clinical Queries", and "Topic-Specific Queries".
- More Resources:** A section with links to "MeSH Database", "Journals Database", "Clinical Trials", "E-Utilities", and "LinkOut".
- Footer:** Includes a "You are here: NCBI > Literature > PubMed" breadcrumb, a "Write to the Help Desk" link, and a "Feedback" icon.

[pubmed.gov](http://pubmed.gov)

### PubMed Home Page

The PubMed homepage includes a NCBI Header, Search Bar, and Footer that are common to all PubMed pages. The **NCBI Header** includes a NCBI Resources pull-down menu categorized by topic, a How To menu, and the Sign In for My NCBI. The **Search Bar** has the database selection menu, and includes a link to **Advanced search** and **Help**. Additional Search bar selections, RSS, and Save search, display after running a PubMed search. Popular tools and resources are under **PubMed Tools** (e.g., the Single Citation Matcher, Clinical Queries, and Topic-Specific Queries) and

**More Resources** (e.g., MeSH Database, Journals Database, and Clinical Trials). The **Footer** includes links to many NCBI resources.

## Searching PubMed

Enter your search term(s) into the search box and click the Search button for basic searching. To find an author, enter the author's last name, then first and second initials (e.g., smith ja). Other search options include the following:

- To search for a journal, use the Journals Database—allows searching by topic, journal title/abbreviation, ISSN, or browsing by subject terms.
- To build a search strategy with MeSH terms, use the MeSH Database—NLM's controlled Medical Subject Heading (MeSH) vocabulary provides a consistent way to retrieve information that may use different terminology for the same concepts.
- To search for specific types of references, use either Clinical Queries or Topic-Specific Queries.

## Limits

Refine and focus your search with the **Limits** option located above the search box. Checkboxes may be selected for Type of Article, Language, Subsets of journals or topics, Ages, Humans or Animals, Gender, and Dates. Restrict a search to items with links to full text, and make multiple choices within categories. A "Limits Activated" message will appear above the search results list. Limits remain in effect until removed.

## Advanced Search

The Advanced Search link provides three options to refine and focus a search: **Search Builder**, **Search History**, and **More Resources**. Search Builder allows creation of a search using Boolean operators. Using the All Fields selection will run search terms through the Automatic Term Mapping process, or a specific field may be selected to apply to the term. Search History tracks search statements and numbers them as links. Clicking on the numbered link provides a menu allowing search statements to be combined into a new search with the AND, OR or NOT boolean operators, or to be run, deleted, examined in Details, or saved in My NCBI. More Resources provides links to the MeSH and Journals databases, Single citation Matcher, Clinical Queries, and Topic-Specific Queries.

**PubMed Advanced Search** [« Back to PubMed](#)

**Search Box** [Limits](#) [Details](#) [Help](#) [Search](#) [Preview](#) [Clear](#)

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**Search Builder**

All Fields [▼](#)  [AND](#) [▼](#) [Add to Search Box](#)

[Show Index](#)  
[Search Builder Instructions](#)

---

**Search History**

[Search History Instructions](#)

---

**More Resources**

[MeSH Database](#)  
[Journals Database](#)  
[Single Citation Matcher](#)  
[Clinical Queries](#)  
[Topic-Specific Queries](#)

## Search Results

Search results initially display in a summary format in the order they were entered in PubMed as last in, first out. By default, the system displays 20 citations per page. Search results include the following:

- Links to related articles for all citations—click the Related Citations link below the citation
- Links to free full text articles, if available,—click Free article below the citation
- Links to free full text journal articles at Web sites of participating publishers—click Free Full Text under Filter your results

- Links to other NLM resources for additional information—see on the right side of your Search Results page, Titles with your search terms, Free Full-text articles in PubMed Central, Find Related Data and other related information

To display the abstract for a journal article, click the title link. Some citations do not have abstracts and will include the note “No abstract available.”

## My NCBI

My NCBI is an easy way to save and update searches on topics of continuing interest. You can choose filters that group your search results. Search updates will automatically be e-mailed to you if selected. To use My NCBI, you must first register and your browser will need to allow pop-ups from the NCBI Web page. Click My NCBI on the right side of the NCBI header.

## Ordering Documents

NLM's Loansome Doc is an automated document ordering program that allows PubMed users to order the full text of an article from a participating library. Before an order can be placed, and before a user can register, all Loansome Doc users must first establish an agreement with a library that uses DOCLINE® (NLM's automated interlibrary loan request and referral system). Users who are unsure about which library to contact may obtain assistance from the Regional Medical Library (RML) in their area by calling 1-800-338-7657, Monday-Friday, 8:30 AM - 5:00 PM in all time zones. To register with Loansome Doc go to [docline.gov/loansome/login.cfm](http://docline.gov/loansome/login.cfm). During the online registration process, you will create a user account with your name, address, e-mail, and ordering preference.

From PubMed registered Loansome Doc users can access Loansome Doc by performing a search, clicking the check box to the left of the articles they want to order, and selecting **Send to Order** from the pull down menu.

## Additional Resources

For further information, we recommend these additional resources:

- [PubMed Help \(an online Help book\)](http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=helppubmed.chapter.pubmedhelp)  
[www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=helppubmed.chapter.pubmedhelp](http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=helppubmed.chapter.pubmedhelp)
- [PubMed Quick Tour: Simple Subject Search](http://www.nlm.nih.gov/bsd/viewlet/search/subject/subject.html)  
[www.nlm.nih.gov/bsd/viewlet/search/subject/subject.html](http://www.nlm.nih.gov/bsd/viewlet/search/subject/subject.html)
- [PubMed Quick Tour: Search for an Author](http://www.nlm.nih.gov/bsd/viewlet/search/author/author.html)  
[www.nlm.nih.gov/bsd/viewlet/search/author/author.html](http://www.nlm.nih.gov/bsd/viewlet/search/author/author.html)
- [CAM \(Complementary and Alternative Medicine\) on PubMed](http://nnlm.gov/training/consumer/cam/cam-pubmed.pdf)  
[nnlm.gov/training/consumer/cam/cam-pubmed.pdf](http://nnlm.gov/training/consumer/cam/cam-pubmed.pdf)
- [Getting Started with LinkOut \(National Network of Libraries of Medicine\)](http://nnlm.gov/training/linkout/)  
[nnlm.gov/training/linkout/](http://nnlm.gov/training/linkout/)



## MEDLINE/PUBMED Search Exercises

**Search Example: Locate toxicological records that reference neurotoxicity risk assessment. Limit your retrieval to toxicology articles written in English.**

Suggested Solution:

- ▶ Go to [pubmed.gov](http://pubmed.gov)
- ▶ Type **neurotoxicity risk assessment** in the search box
- ▶ Click **Limits**

- ▶ Click the “English” checkbox under **Languages**
- ▶ Click the “Toxicology” checkbox under **Subsets**
- ▶ Click the **Search** button at the top of the page

- ▶ Click a record link of your choice

- ▶ Review the record retrieved
- ▶ Deselect the **Limits Activated** by clicking on the **Remove** button

**Exercise 1: What research is available for the use of oral rehydration therapy for the treatment of diarrhea associated with cholera?**

Suggested Solution:

Type	<b>oral rehydration therapy diarrhea cholera</b> in the search box
Click	the <b>Go</b> button
Review	the citation(s) and related articles
Click	the <b>Clear</b> button to the right of the search box to prepare for the next search.

**Exercise 2: Locate articles that discuss population studies of colon cancer in Blacks and Whites.**

Suggested Solution:

Type	<b>colon cancer blacks white</b> in the search box
Click	the <b>Go</b> button
Review	the citation(s) retrieved
Click	the <b>Clear</b> button to the right of the search box to prepare for the next search.

**Exercise 3: Recently there has been an increase globally in dengue flu. What research has been published in the *American Journal of Tropical Medicine and Hygiene* within the past year?**

Suggested Solution:

Type	<b>dengue fever</b> in the search box
Click	the <b>Limits</b> tab
Click	<b>Add Journal</b> to the right of Search by Journal
Type	<b>american journal of tropical medicine and hygiene</b> in the <b>Journal Name</b> search box
Select	<u>1 year</u> from the <b>Published in the Last</b> pull-down menu
Click	the <b>Go</b> button

Review	the citation(s)
Click	the <b>Clear</b> button to the right of the search box to prepare for the next search.

**Exercise 4:** Dr. Sungano Mharakurwa is a leading authority on the **genetic structure of malaria parasites**. Find an article written by Dr. Mharakurwa titled, “**PCR detection of Plasmodium falciparum in human urine and saliva samples**”.

Suggested Solution:

Type	<b>PCR detection Plasmodium falciparum urine saliva</b> in the search box
	 Deselect the one year limit
Click	the <b>Limits</b> tab
Click	<b>Add Author</b> button to the right of Search by Author
Type	<b>sungano mharakurwa</b> in the <b>Author Name</b> search box
Click	the <b>Go</b> button
Review	the citation
	 You do not need to deselect Limits after an author search.
Click	the <b>Clear</b> button to the right of the search box to prepare for the next search.

**Exercise 5:** Research articles on the subject of health disparities in the United States. Next, e-mail the abstract of the first record to yourself in text format.

Suggested Solution:

Type	<b>US health disparities</b> in the search box
Click	the <b>Go</b> button
Click	the box to the left of your choice
Select	<u>E-mail</u> from the <b>Send to</b> pull-down menu
Click	the <b>Send to</b> button
Select	<u>Abstract</u> and <u>Text</u> from the Format pull-down menu and <u>Text</u> from the Format as menu
Type	your e-mail address in the e-mail address box
Click	the <b>Mail</b> button
Review	the e-mail confirmation message highlighted in pink above the abstract
Click	the TOXNET link under <b>Related Resources</b> in the blue sidebar to prepare for the next session

**Exercise 6: Set up a My NCBI user account and conduct and save a search for journal articles on the prevalence of asthma in children.**

Suggested Solution:

- Click [My NCBI](#) in the left sidebar under “PubMed Services”
- Click [register for an account](#) under “**Sign into My NCBI**”
  -  Clicking the “Keep me signed in” checkbox will create a permanent cookie so that My NCBI will be indefinitely available on your computer without signing in again.
- Type **asthma prevalence children** in the search box
- Click the **Go** button
- Click **Save Search** at the top of the screen to the right of the search box
- Click the **Save** button
- Complete the Save Search Settings form (optional)
- Click [Save](#)
  -  Your search (asthma prevalence children) will be listed

# Saving and Printing Records in PubMed

The PubMed **Send to Text** function creates a text file of PubMed records, which you can save on your computer. The **Send to** button is available on screens with search results. You can save the entire results of a specific search or selected records. If you don't select specific records before clicking on the **Send to** button, you will create a file on your computer that will contain the entire search results, up to a maximum of 10,000 items.

You can also save records collected from multiple searches by using the **Send to Clipboard** feature. The Clipboard holds a maximum of 500 items. When you save a file, your browser will prompt you to specify where this file should be placed on your computer, and also give you the opportunity to rename the file.

## Saving Entire Search Results

- Use the **Display** pull-down menu to select a format.
- Click **Send to File** and your items will be saved in the **Display** format as plain text.  
 The default for the File feature is to save the entire retrieval—up to 10,000 items—unless you specifically select citations. For example, if you use the Send to File selection on a screen displaying 1-20 items of 2,356, your saved file will contain all 2,356 citations.

## Saving Selected Citations from a Single Search

- Use the **Display** pull-down menu to select a format.
- Click in the check boxes next to each citation you want to save. You can move to other pages within the search results to make additional selections.
- Click **Send to File** and your selected items will be saved in the **Display** format as plain text.  
 Saving a large retrieval may take several minutes. To save citations in html format, use the Save as... function of your browser and change the file extension to html. This will save only the citations displayed on the screen, so you may wish to use the **Show** function and **Send to Text** to adjust your display as needed.

## Clipboard

To place an item in the Clipboard, click on the check box to the left of the citation, select **Clipboard** from the **Send to** pull-down menu, and then click the **Send to** button. Once you have added a citation to the Clipboard, the record number color will change to green.

 If you select **Clipboard** from the **Send to** menu without selecting citations using the check box, PubMed will add all (up to 500 citations) of your search results to the Clipboard. The

Clipboard will be lost after one hour of inactivity on PubMed or any of the other Entrez databases.

-  PubMed uses cookies to add your selections to the clipboard. In order for you to use this feature your Web browser must be set to accept cookies.
-  Citations in the clipboard are represented by the search number #0, which may be used in Boolean search statements. For example, to limit the citations you have collected in the Clipboard to English language citations, use the following search:  
#0 AND english [1a]
-  This does not affect or replace the Clipboard contents.

## E-mail

To e-mail your results, click on specific citations and select **E-mail** from the **Send to** pull-down menu. You may e-mail up to 500 items. You may select the format, the sorting method, and HTML or text. In addition, you may enter a message that will be included with the PubMed search results in the e-mail message. The e-mail page reflects settings from the results page and can be modified.

After clicking the **Mail** button, the system returns you to your results page and displays a message confirming that the e-mail message was sent. Your PubMed results will be sent from the NCBI automatic mail server, Sent by Entrez [nobody@ncbi.nlm.nih.gov] with a "Subject" of PubMed Search Results. Do not reply to this message. This is not a functioning customer service e-mail address.

-  If you choose HTML, your PubMed e-mail message displays as a PubMed results page and includes hyperlinks to Related Articles, LinkOut, and other PubMed features. The recipient's e-mail program must be set for HTML view in order to properly view in HTML format.

## Order

The **Order** function allows you to order the full-text copy of an article from a library in your area using the **Order Documents** feature of PubMed.

-  Prior to using this program, you must establish an agreement with a Loansome Doc participating library. During the registration process, you will have the opportunity to search for a Loansome Doc provider in your area (U.S. and International). Local fees may apply. To register, click Order Documents from the PubMed sidebar menu, then Loansome Doc under **Loansome Doc Options**, then Sign up! from the Loansome Doc screen.
-  Once you have registered with Loansome Doc, you can order citations by clicking the check box to the left of each citation you want to order. When you have finished marking your selections (you may move to other pages within your results), select Order from the **Send to** menu, and click the **Send to** button. You may also use the Clipboard to collect items from multiple searches before ordering.



For some journals the full-text of articles are available via a PubMed link to the publisher's Web site. Publisher links for the full-text of the article are displayed on the Abstract or Citation display. You may also choose LinkOut from the Links pull-down menu to the right of each citation. LinkOut is a PubMed feature that links to outside sources for the full-text of the article, e.g., a publisher's Web site, as well as other resources such as biological databases and sequencing centers. User registration, a subscription fee, or some other type of fee may be required to access the full-text of articles in some journals.

### Importing Citations into a Reference Manager Program

To import search results into a reference manager program, change the **Display** format to MEDLINE, select File from the **Send to** pull-down menu, then click **Send to**. This format includes the field tags needed for these programs.

Consider changing the .fcgi extension to .txt if you wish to open the file in a text editor, word processing, or reference manager program.

### Print

Use the print function of your Web browser to print all the information and citations displayed on your Web page. Before printing, consider using the Show (number of pages) Feature to increase the number of documents per page so that the total number of documents is displayed on one page (maximum: 500 per page). You can print only the citations from the displayed page.



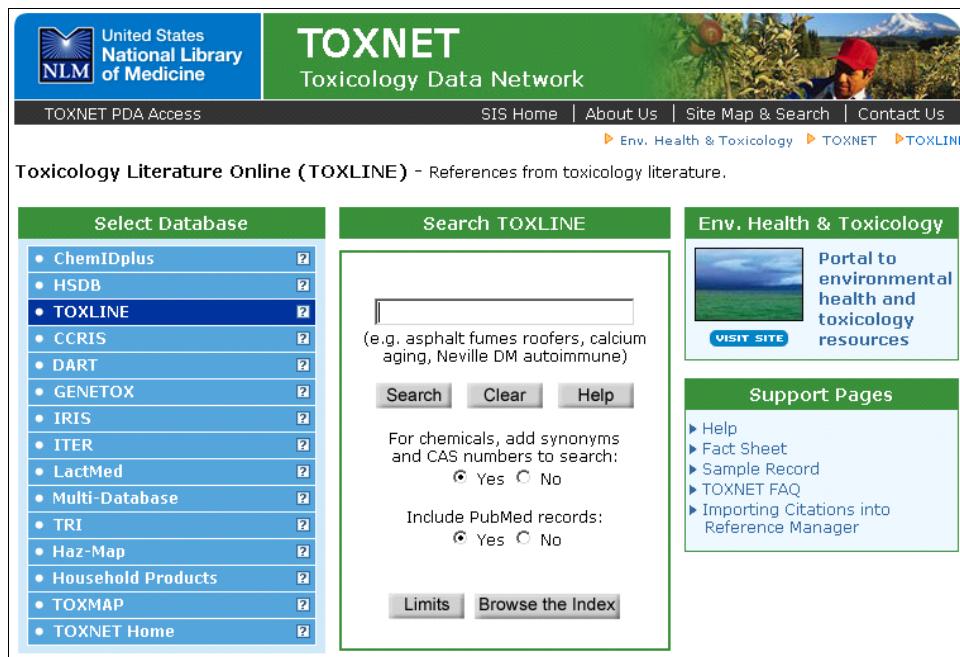
You may also wish to display your citations as "Text" to strip the sidebar menu and toolbars prior to printing your results.



You may want to print selected items from one or more searches on a single page. You can do this by collecting them in PubMed's Clipboard.

# TOXLINE

**TOXLINE** is NLM's bibliographic database for toxicology, providing information covering the biochemical, pharmacological, physiological, and toxicological effects of drugs and other chemicals. It contains over 4 million bibliographic citations from 1965 to the present, most with abstracts and/or indexing terms and Chemical Abstracts Service (CAS) Registry Numbers.



The screenshot shows the TOXNET homepage. At the top left is the NLM logo with the text "United States National Library of Medicine". The top center features the "TOXNET Toxicology Data Network" logo with a background image of a person in a field. The top right has links for "SIS Home", "About Us", "Site Map & Search", and "Contact Us". Below these are links for "Env. Health & Toxicology", "TOXNET", and "TOXLINE". The main content area is divided into several sections: "Select Database" (listing ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITER, LactMed, Multi-Database, TRI, Haz-Map, Household Products, TOXMAP, and TOXNET Home), "Search TOXLINE" (with a search bar, placeholder text "(e.g. asphalt fumes roofers, calcium aging, Neville DM autoimmune)", and buttons for "Search", "Clear", and "Help"), "Env. Health & Toxicology" (with a "VISIT SITE" button and a "Portal to environmental health and toxicology resources" link), and "Support Pages" (listing Help, Fact Sheet, Sample Record, TOXNET FAQ, Importing Citations into Reference Manager, and Limits/Browse the Index).

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

## TOXLINE Components

TOXLINE references come from various sources organized into components. These components are searched together but may be used to limit searches.

- ▶ **Standard biomedical/toxicology journal literature**
  - MEDLINE/PubMed
- ▶ **Special journal and other research literature**
  - Developmental and Reproductive Toxicology (DART)
  - International Labour Office (CIS)
- ▶ **Technical reports and research projects**
  - Federal Research in Progress (FEDRIP)
  - Toxic Substances Control Act of Test Submissions (TSCATS)
  - Toxicology Document and Data Depository (NTIS)

- Toxicology Research Projects (CRISP)
- ▶ **Meeting Abstracts**
- ▶ **Archival Collection (no longer being updated)**
  - Aneuploidy (ANEUPL)
  - Environmental Mutagen Information Center File (EMIC)
  - Environmental Teratology Information Center File (ETIC)
  - Epidemiology Information System (EPIDEM)
  - Hazardous Materials Technical Center (HMTC)
  - Health Aspects of Pesticides Abstract Bulletin (HAPAB)
  - International Pharmaceutical Abstracts (IPA)
  - NIOSHTIC (NIOSH)
  - Pesticides Abstracts (PESTAB)
  - Poisonous Plants Bibliography (PPBIB)
  - Swedish National Chemicals Inspectorate (RISKLIN)
  - Toxicological Aspects of Environmental Health (BIOSIS)

## Searching TOXLINE

Any terms you enter in the query box will automatically be searched against both the keyword and MeSH fields, in addition to other fields such as title, abstract, and author. Chemical names are mapped to names, synonyms, and CAS Registry Numbers derived from ChemIDplus. Words such as "a," "an," "and," "for," "the," and "it" will not be searched.

Limits may be applied to narrow your search to:

- ▶ Titles or authors
- ▶ Exact words or word variants
- ▶ Year of publication
- ▶ Documents added within a specified number of months
- ▶ TOXLINE components (more than one component can be selected)
- ▶ Language

You may also specify the maximum number of records you would like retrieved.

## Search Results

Address: <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>

**TOXNET**  
Toxicology Data Network

TOXLINE  
Search Results

toluidine bladder cancer

For chemicals, add synonyms and CAS numbers to search:  Yes  No  
Include PubMed records:  Yes  No

Items 1 through 20 of 102  
records are sorted in [relevancy ranked](#) order and not by date.  
Click on Sort to change the order of the retrieved records.

Pages: 1 2 3 4 5 6 >

Select Record record

1  Excess number of bladder cancers in workers exposed to ortho-toluidine and aniline.  
Ward E; Carpenter A; Markowitz S; Roberts D; Halperin W  
J Natl Cancer Inst. 1991, Apr 3; 83(7):501-6. [Journal of the National Cancer Institute]  
[PubMed]

2  Monitoring of aromatic amine exposures in workers at a chemical plant with a known bladder cancer excess.  
Ward EM; Sablonni G; DeBord DG; Teas AW; Brown KK; Talaska GG; Roberts DR; Ruder AM; Streicher RP

**Link to PubMed Citation**

Your initial retrieval is displayed as a list—in relevancy ranked order—of bibliographic references with the titles in blue. Each reference is followed by the acronym [in brackets] of the component from which the article was retrieved. References coming from MEDLINE/PubMed will be marked PubMed citation with a green and blue M-encircled icon (M) and linked to the same reference in PubMed. Clicking on this link takes you to PubMed where you can use functions such as LinkOut, Related Links, and document ordering.

## Selected Record Screen

Related Records

Search Results

Download

Basic Search

Browse Index

Modify Search

Details

History

Help

TOXNET Home

**TOXNET**  
Toxicology Data Network

TOXLINE

toluidine bladder cancer

For chemicals, add synonyms and CAS numbers to search:  Yes  No  
Include PubMed records:  Yes  No

Item 1 of 101 >

Excess number of **bladder cancer**s in workers exposed to ortho-**toluidine** and aniline.  
Authors: **Ward E**, **Carpenter A**, **Markowitz S**, **Roberts D**, **Halperin W**

PubMed Citation

Author Address: Industrywide Studies Branch, National Institute for Occupational Safety and Health, Cincinnati, Ohio 45226.

Source: J Natl Cancer Inst. 1991, Apr 3; 83(7):501-6. [Journal of the National Cancer Institute]

Comments:

Comment in: J Natl Cancer Inst. 1991 Nov 20;83(22):1696-7 (medline/1749022)  
Comment in: J Natl Cancer Inst. 1991 Oct 16;83(20):1507-8 (medline/1920498)  
Comment in: J Natl Cancer Inst. 1994 Jan 5;86(1):59-62 (medline/8271886)

Abstract:

A retrospective cohort study of the incidence of **bladder cancer** was conducted in response to a union request for an evaluation of a possible excess number of cases of **bladder cancer** at a chemical plant in western New York State. Workers at the plant were exposed to ten potential

← **Search terms are red**

← **Linked terms are blue**

← **Search terms are red**

The record screen displays the complete record for the item you selected on the results screen. Your search terms are in red. Individual author names, MeSH headings, keywords, and CAS

Registry Numbers are in blue and linked to similar records in the database. Click an author link to find other articles by that author; Click a keyword to find other articles indexed with that keyword.

Other information appearing includes the article language, the month it was entered into the system, the year of publication, and a secondary source ID—a unique identifying number for the record and tagged to its component.

## **Additional Resources**

For further information, we recommend these additional resources:

- ▶ [PubMed](http://pubmed.gov)  
pubmed.gov
- ▶ [TOXLINE Fact Sheet](http://www.nlm.nih.gov/pubs/factsheets/toxliefs.html)  
www.nlm.nih.gov/pubs/factsheets/toxliefs.html
- ▶ [Importing Citations into Reference Manager](http://sis.nlm.nih.gov/enviro/captivate/toxlinespecialimports.htm)  
sis.nlm.nih.gov/enviro/captivate/toxlinespecialimports.htm
- ▶ [Free Full Text Health Science/Medical Journals](http://sis.nlm.nih.gov/pdf/FreeFullTextListApril07.pdf)  
sis.nlm.nih.gov/pdf/FreeFullTextListApril07.pdf



# TOXLINE Search Exercises

**Search Example: Research records about cancer among agricultural workers. Do not include PubMed citations.**

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **TOXLINE** in the **Select Database** column
- ▶ Type **cancer agricultural workers** in the search box
- ▶ Click the **No** button under Include PubMed records
- ▶ Click the **Search** button

- ▶ Review the citations
- ▶ Click the **Basic Search** button at the left of the page to prepare for the next search

**Exercise 1: Locate recent articles focused on the effects of diet on breast cancer. Limit your search to articles published since 2007.**

Suggested Solution:

Type	<b>diet breast cancer</b> in the search box
Click	the <b>Limits</b> button
Select	Titles under “Search fields.”
Type	<b>2007</b> in the first Year of Publication box (replacing “1900”)
Click	the <b>Search</b> button
Review	record(s) of your choice
Click	the <b>Basic Search</b> button at the left of the page to prepare for the next search

**Exercise 2: Search for the chemical of concern in baby bottles, *bisphenol A* (BPA). Explore navigating through your retrieval, examining individual records, and going to linked records.**

Suggested Solution:

Type	<b>bisphenol a AND baby bottles</b> in the search box
Click	the <b>Search</b> button
Review	record(s) of your choice
Click	the <b>Basic Search</b> button at the left of the page to prepare for the next search

**Exercise 3: Locate English citations on workers exposed to *caprolactam***

Suggested Solution:

Type	<b>occupational exposure caprolactam</b> in the search box
Click	the <b>Limits</b> button
Select	<u>English</u> in the Language box
Click	the <b>Search</b> button
Click	the <b>Sort</b> button in the left margin
Select	<u>Ascending</u> after Year of Publication
Click	<b>Sort</b>
Review	the citation(s)
Click	the <b>Basic Search</b> button at the left of the page to prepare for the next search

# DART

**DART** is a bibliographic database that covers teratology and other aspects of developmental and reproductive toxicology. It contains over 200,000 references to literature published since 1965.

[toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)

DART has some of the same features as PubMed, including the following: MeSH searching; applying limits by field, publication type, age, gender, language, human or animal, etc.; MyNCBI to store and update search strategies; Related Records; LinkOut and Links to Books; and Interlibrary Loan (Loansome Doc).

## Searching DART

Any term(s) you enter in the query box will automatically be searched against both the keyword and MeSH fields, in addition to other fields such as title, abstract, and author.

Chemical names are mapped to names, synonyms, and CAS Registry Numbers derived from ChemIDplus. Words such as "a," "an," "and," "for," "the," and "it" will not be searched.

Limits may be applied to narrow your search to:

- ▶ Titles
- ▶ Authors
- ▶ Exact words or word variants
- ▶ Year of publication
- ▶ Documents added within a specified number of months
- ▶ Language

You may also specify the maximum number of records you would like retrieved.

## Search Results

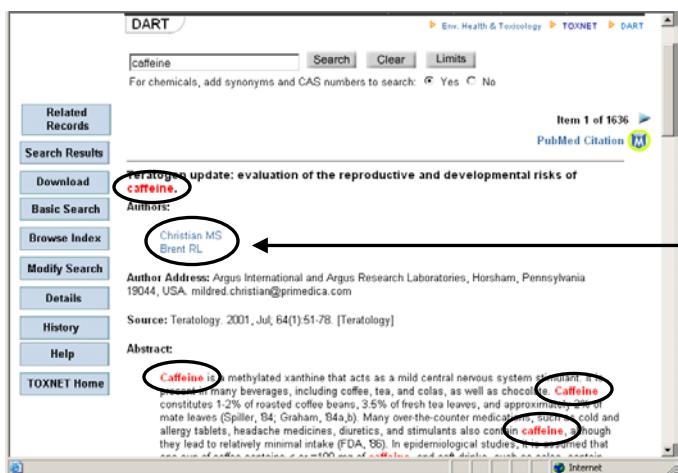


The screenshot shows the DART Search Results page for the query "coffeeine". The results are sorted in relevancy ranked order. The first result is a TOXLINE reference: "Teratogen update: evaluation of the reproductive and developmental risks of coffeeine." by Christian MS, Brent RL, published in Teratology 2001, Jul; 64(1):51-78. The second result is a PubMed citation: "Caffeine intake and fecundability: a follow-up study among 430 Danish couples planning their first pregnancy." by Jensen TK, Henriksen TB, Hjollund NH, Scheike T, Kolstad H, Gwercman A, Ernst E, Bonde JP, Skakkebaek NE, Olsen J, Reprod Toxicol. 1998 May-Jun; 12(3):289-95. Both results have a green and blue M-encircled icon next to the PubMed citation, which is linked to the same citation as it appears in PubMed.

 **Link to PubMed Citation**

Your initial retrieval is displayed as a list—in relevancy ranked order—of bibliographic references with the titles in blue. Each reference is followed by the mnemonic [in brackets] of the subfile from which the article was retrieved. References that come from MEDLINE/PubMed have TOXLINE [PubMed] following the bibliographic citation. They also have PubMed Citation in blue and a green and blue M-encircled icon. This icon is linked to the same citation as it appears in PubMed. Click this icon to go to PubMed where you can use any of the PubMed functions such as LinkOut and document ordering.

## Selected Record Screen



The screenshot shows the DART Selected Record Screen for the first search result. The record is for "Teratogen update: evaluation of the reproductive and developmental risks of coffeeine." by Christian MS, Brent RL. The record includes the abstract, author information, and source. The word "coffeeine" appears in red, indicating it is a search term. Other terms like "Christian MS" and "Brent RL" are in blue, indicating they are hot-linked terms. A green and blue M-encircled icon is present next to the PubMed citation, which is linked to the same citation as it appears in PubMed.

Hot-linked terms in blue

← Search terms in red

This screen displays the complete record for the item you selected on the Results Screen. Your search terms are in red. Individual author names, MeSH headings, keywords, and CAS Registry Numbers are in blue and linked to related records in the database. Click an author link to find other articles by that author; Click a keyword to find other articles indexed with that keyword. Other information on the page includes the article language, the month it was entered into the system, the year of publication, and a secondary source ID—a unique identifying number for the record and

tagged to its subfile. References from PubMed have the PubMed citation designation and the green-and-blue PubMed symbol (PubMed).

## Additional Resources

For further information, we recommend these additional resources:

- ▶ [DART Fact Sheet](http://www.nlm.nih.gov/pubs/factsheets/dartfs.html)  
www.nlm.nih.gov/pubs/factsheets/dartfs.html
- ▶ [PubMed](http://pubmed.gov)  
pubmed.gov
- ▶ [Importing citations into Reference Manager](http://sis.nlm.nih.gov/enviro/captivate/toxlinespecialimports.htm)  
sis.nlm.nih.gov/enviro/captivate/toxlinespecialimports.htm



## DART Search Exercises

### Search Example: Find information on the effects of alcohol on the fetus.

Suggested Solution:

- ▶ Go to [toxnet.nlm.nih.gov](http://toxnet.nlm.nih.gov)
- ▶ Click **DART** in the **Select Database** column
- ▶ Type **alcohol fetus** in the search box
- ▶ Click the **Search** button

- ▶ Click the record of your choice to view the abstract
- ▶ Click the **Basic Search** button at the top of the page to prepare for the next search

**Exercise 1: Find the latest citations pertaining to food allergies and prevention. Sort the citations by author in descending order.**

Suggested Solution:

Type	<b>food allergies prevention</b> in the search box
Click	the <b>Search</b> button
Review	the citation(s)
Click	the <b>Sort</b> button on the left of the page
Select	<b>Author</b> and <b>Descending</b> order
Click	<b>Sort</b>
Review	the citations
Click	the <b>Basic Search</b> button at the top of the page to prepare for the next session

**Exercise 2: Locate articles on psychomotor stimulants.**

Suggested Solution:

Type	<b>psychomotor stimulants</b> in the search box
Click	the <b>Search</b> button
Review	the citation(s)
	 The results will be in relevancy ranked order.
Click	the <b>Basic Search</b> button at the left of the page to prepare for a new search

**Exercise 3: Locate citations on the subject of eating fish while pregnant. Limit your search to English articles published in the years 2008-2010.**

Suggested Solution:

Type	<b>pregnancy fish consumption</b> in the search box
Click	the <b>Limits</b> button
Delete	1900 in the Year of Publication box and type 2008
Select	<u>English</u> in the Language menu
Click	the <b>Search</b> button
Review	the citation(s)
	 The results will be in relevancy ranked order.
Click	The TOXNET Home button at the left of the page to prepare for a new session

# More to Explore



*The National Library of Medicine  
Web Resources for Environmental Health and Biomedical Research*



## Enviro-Health Links

**Enviro-Health Links**, available from the NLM Environmental Health and Toxicology Portal, is a list of links to Internet resources on toxicology and environmental health issues of recent special interest. All resources are evaluated and selected according to specific criteria. You may also search TOXNET from this page. From the Environmental Health and Toxicology Portal, click **Enviro-Health Links** under **More to Explore**.



[sis.nlm.nih.gov/enviro/envirohealthlinks.html](http://sis.nlm.nih.gov/enviro/envirohealthlinks.html)

Links to information of special interest include:

- ▶ Arsenic and Human Health
- ▶ Biological Warfare
- ▶ California Wildfires
- ▶ Chemical Warfare
- ▶ Dietary Supplements
- ▶ Health Effects from the Collapse of the World Trade Center
- ▶ Environmental Justice Internet Guide
- ▶ Hurricanes: Links to Health Information
- ▶ Indoor Air Pollution
- ▶ Keeping the Artist Safe: Hazards of Arts and Crafts Materials
- ▶ Lead and Human Health
- ▶ Mercury and Human Health
- ▶ Outdoor Air Pollution
- ▶ Pesticide Exposure
- ▶ Special Populations: Emergency and Disaster Preparedness
- ▶ Tornadoes
- ▶ Toxicogenomics
- ▶ West Nile Virus: Pesticides Used for Mosquito Control

## ToxSeek

ToxSeek® is a free meta-search engine developed by the [Division of Specialized Information Services](#) at the [National Library of Medicine](#). ToxSeek enables users to search across diverse biomedical and environmental health resources and provides a method for efficiently locating information resources on topics related to toxicology and environmental health. ToxSeek uses natural language processing and artificial intelligence to retrieve, integrate, rank, and present search results as coherent and dynamic sets.

**ToxSeek**  
Meta-Search and Discovery Engine  
for Environmental Health and Toxicology

Help | About ToxSeek | SIS Home | Environmental Health and Toxicology | About Us | Site Map & Search | Contact Us

Search

**NLM**

<input checked="" type="checkbox"/> HSDB	<input checked="" type="checkbox"/> TOXLINE	<input checked="" type="checkbox"/> AltBib	<input checked="" type="checkbox"/> CCRIS
<input checked="" type="checkbox"/> ChemIDplus	<input checked="" type="checkbox"/> DART	<input checked="" type="checkbox"/> GENE-TOX	<input checked="" type="checkbox"/> Haz-Map
<input checked="" type="checkbox"/> Household Products	<input checked="" type="checkbox"/> ITER	<input checked="" type="checkbox"/> TRI	<input checked="" type="checkbox"/> LactMed
<input checked="" type="checkbox"/> MedlinePlus Dictionary	<input checked="" type="checkbox"/> Arctic Health	<input checked="" type="checkbox"/> Bookshelf	<input checked="" type="checkbox"/> ClinicalTrials
<input checked="" type="checkbox"/> MedlinePlus	<input checked="" type="checkbox"/> PubMed	<input checked="" type="checkbox"/> PubMed Central	<input checked="" type="checkbox"/> NLM Catalog

**NIH**

<input checked="" type="checkbox"/> NCI	<input checked="" type="checkbox"/> NIEHS
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**U.S. Government**

<input checked="" type="checkbox"/> AgNIC	<input checked="" type="checkbox"/> ATSDR	<input checked="" type="checkbox"/> CDC	<input checked="" type="checkbox"/> CDC - NIOSH
<input checked="" type="checkbox"/> CDC - eCosh	<input checked="" type="checkbox"/> CDC - NASD	<input checked="" type="checkbox"/> CPSC	<input checked="" type="checkbox"/> CSB
<input checked="" type="checkbox"/> DOE	<input checked="" type="checkbox"/> DOE -	<input checked="" type="checkbox"/> DOF -	<input checked="" type="checkbox"/> DOI -

**toxseek.nlm.nih.gov**

ToxSeek allows users to search in a wide range of authoritative sources in these categories:

- ▶ **NLM TOXNET**—Databases on hazardous chemicals, toxic releases and environmental health from the National Library of Medicine (NLM)
- ▶ **Other NLM**—Additional selected resources from NLM, including PubMed
- ▶ **NIH**—Resources from other institutes of the National Institutes of Health (NIH)
- ▶ **U.S. Government**—Toxicology/environmental health information from other United States government agencies
- ▶ **International**—Other selected international resources, such as the World Health Organization (WHO)
- ▶ **Other Resources**—Other topic-specific information resources



## ToxSeek Search Exercise

**Search Example: Locate information on hydrazine sulfate, an alternative treatment for cancer. Limit the search to TOXNET and other NLM resources. Review the HSDB records.**

Suggested Solution:

- ▶ Go to [toxseek.nlm.nih.gov](http://toxseek.nlm.nih.gov)
- ▶ Type **air pollution** in the search box
- ▶  By default all ToxSeek selected resources: NLM, NIH, U.S. Government, International, and Other Resources are selected
- ▶ Click the **Search** button

- ▶ Click **U.S. Government**

- ▶ Click [ATSDR](#) listed at the top of the page

- Review the records
- Close the pop-up window

The screenshot shows the CDC Home page with the title 'Centers for Disease Control and Prevention' and the tagline 'Your Online Source for Credible Health Information'. A search bar at the top right contains the text 'air pollution' with a 'SEARCH' button to its right. Below the search bar is a link 'Need help? [Search Tips](#)'. A note at the top right of the search results area says: 'Text size: S M L XL' with radio buttons for S, M, L, and XL, and a 'SEARCH' button. To the right of the search results is a sidebar with a 'Text size' dropdown, 'Email page', 'Print page', and 'Bookmark and share' options. A small window titled '4 CDC Info' shows 'Txt: HEALTH' and 'To: 87000' with a 'LEARN MORE' button. The search results are titled 'Search Results' and show 'Results 1 - 10 of about 1590'. The first result is 'ATSDR - Air pollution' with a link to 'www.atsdr.cdc.gov/general/theair.html'. The second result is 'Taking an Exposure History - What Are the Possible Sources ...' with a link to 'www.atsdr.cdc.gov/csem/exphistory/ehindoor\_pollution.html'. The third result is 'Air pollution How does air pollution affect me? The Air Quality ...' with a link to 'www.atsdr.cdc.gov/general/theair.pdf'. The sidebar on the right contains 'Search Tips' with the text: 'To conduct more precise search queries... • Keep searches simple: one to three'.

## ALTBIB

ALTBIB is a searchable bibliographic collection on alternatives to animal testing. It includes citations from published articles, books, book chapters, and technical reports from 1980 to 2000. Citations were selected manually after searching various [National Library of Medicine](#) (NLM) bibliographic databases. The bibliography features citations concerning methods, tests, assays, and procedures that may prove useful in establishing alternatives to the use of intact vertebrates. ALTBIB has not been updated since 2001 because new features were added to [PubMed®/MEDLINE®](#) to assist users in searching and retrieving directly from the file. Search strategies for some animal alternatives have been developed and incorporated in the ALTBIB search interface.

ALTBIB - Resources on Alternatives to the Use of Live Vertebrates in Biomedical Research and Testing.

**Search ALTBIB & PubMed**

Enter search terms. Select ALTBIB or PubMed:

(e.g. Corrositex, "androgen receptor binding assay")

ALTBIB (up to 2000), limit the search to:  
 Any Year up to 2000  
 All Categories

PubMed (with animal alternatives search strategy), limit the search to:  
 2000 to Present  
 Animal Use Alternatives (MeSH)  
 Toxicology Subset

**News and Features**

- ▶ 27 Apr 2009: Countries Unite to Reduce Animal Use in Product Toxicity Testing Worldwide (NIEHS)
- ▶ Since You Asked - Alternatives to Animal Testing — Questions and Answers about ICCVAM (NIEHS)

**Additional Resources**

- ▶ ALTWEB - Alternatives to Animal Testing on the Web
- ▶ Animal Welfare Information Center (USDA)
- ▶ ECVAM - European Centre for the Validation of Alternative Methods
- ▶ FRAME - Fund for the Replacement of Animals in Medical Experiments
- ▶ ICCVAM - Interagency Coordinating Committee for the Validation of Alternative Methods (HHS/NIH/NIEHS)
- ▶ Johns Hopkins Center for Alternatives to Animal Testing
- ▶ University of California Center for Animal Alternatives
- ▶ Society of Toxicology - Awards in Alternative Methods

**Live PubMed Searches on Selected Topics**

**Support Pages**

[toxnet.nlm.nih.gov/altbib.html](http://toxnet.nlm.nih.gov/altbib.html)

## Searching HSDB

Search ALTBIB (1980 to 2000) by term or by one of these 15 categories:

- ▶ General
- ▶ Carcinogenesis
- ▶ Cytotoxicity
- ▶ Dermal Toxicity

- ▶ Ecotoxicity
- ▶ Genotoxicity
- ▶ Hepatic and Renal Toxicity
- ▶ Immunotoxicity and immunology
- ▶ Neurotoxicity
- ▶ Ocular Toxicity
- ▶ Pharmacokinetic and Mechanistic Studies
- ▶ Pulmonary Toxicity
- ▶ Quantitative Structure Activity Relationships
- ▶ Reproductive and Developmental Toxicity
- ▶ Animal Welfare

You can also search MEDLINE/PubMed from the ALTBIB page by selecting “PubMed (with animal alternative search strategy). The search can be limited by date (**2000 to Present**), **Animal Use Alternatives (MeSH)**, and **Toxicology Subset**. Search strategies incorporated in the ALTBIB search interface can be seen by clicking on the **Details** tab on the PubMed search results page.



## ALTBIB Search Exercises

**Search Example: Find bibliographic articles that emphasize alternative uses for cytotoxicity research.**

Suggested Solution:

- ▶ Go to [sis.nlm.nih.gov/enviro.html](http://sis.nlm.nih.gov/enviro.html)
- ▶ Click “ALTBIB” under **Other Professional Resources**
- ▶ Type **cytotoxicity** in the search box
- ▶ Click the **Search** button

**Please login or enter anonymously**  
 User Name:  Password:



**ALTBIB**  
Bibliography on Alternatives to Animal Testing

SIIS Home | About Us | Site Map & Search | Contact Us

Env. Health & Toxicology | ALTBIB

ALTBIB - Bibliography on Alternatives to the Use of Live Vertebrates in Biomedical Research and Testing.



**News and Features**

- ▶ 27 Apr 2009: Countries Unite to Reduce Animal Use in Product Toxicity Testing Worldwide (NIEHS)
- ▶ Since You Asked - Alternatives to Animal Testing — Questions and Answers about ICCVAM (NIEHS)

**Additional Resources**

- ▶ ALTBIB - Alternatives to Animal Testing
- ▶ Animal Welfare Information Center (USDA)
- ▶ ECVAM - European Centre for the Validation of Alternative Methods
- ▶ FRAME - Fund for the Replacement of Animals in Medical Experiments
- ▶ ICCVAM - Interagency Coordinating Committee for the Validation of Alternative Methods (IHS/NID/NIEHS)
- ▶ Johns Hopkins Center for Alternatives to

**Search ALTBIB & PubMed**

Enter search terms. Select ALTBIB or PubMed:

cytotoxicity

(e.g. Corrositex, "androgen receptor binding assay")

ALTBIB (up to 2000), limit the search to:

All Categories

PubMed (with animal alternatives search strategy), limit the search to:  
 2000 to Present  
 Animal Use Alternatives (MeSH)  
 Toxicology Subset

[View/Edit PubMed Search Strategy](#)

- ▶ Review a record of your choice
- ▶ Click the **Basic Search** button at the left of the page to prepare for the next search

**Please login or enter anonymously**  
 User Name:  Password:



**ALTBIB**  
Bibliography on Alternatives to Animal Testing

SIIS Home | About Us | Site Map & Search | Contact Us

TOXNET | ALTBIB

ALTBIB Search Results



**Print this page**

**Search tips**

**Find full text**

cytotoxicity

Include PubMed records:  Yes  No

Items 1 through 20 of 988 Page 1 of 50

records are sorted in [relevancy ranked](#) order and **not by date**.  
 Click on **Sort** to change the order of the retrieved records.

<b>Select</b>	<b>Record</b>	
1 <input type="checkbox"/> Accelerated toxicity testing of casting alloys and reduction of intraloral release of elements. Nelson SK, Wataha JC, Lockwood PE J Prosthet Dent 1999;81(6):715-20.		
2 <input type="checkbox"/> Cytotoxicity of dental casting alloys pretreated with biologic solutions. Nelson SK, Wataha JC, Neme AM, Ciblerka RM, Lockwood PE J Prosthet Dent 1999;81(5):591-6.		
3 <input type="checkbox"/> CYTOTOXICITY ASSAYS WITH THE RAINBOW TROUT R1 CELL LINE Segner H, Lenz D Toxicology In Vitro 1993; 7(4):537-540		
4 <input type="checkbox"/> CYTOTOXICITY ASSAYS WITH THE RAINBOW TROUT R1 CELL LINE Segner H, Lenz D Toxicol In Vitro 1993;7(4):537-40		

**Exercise 1: Using the limit feature, locate an article on genotoxicity and mutagenesis dated 1998-2000.**

Suggested Solution:

Type	<b>genotoxicity AND mutagenesis</b> in the search box
Select	<b>1998-2000</b> from the year pull-down menu under ALTBIB
Click	the <b>Search</b> button
Review	a record of your choice
Click	the <b>TOXNET Home</b> button to the left of the page to prepare for the next session

## Carcinogenic Potency Database

The **Carcinogenic Potency Database (CPDB)**, developed at the University of California, Berkeley, and Lawrence Berkeley Laboratory, provides standardized analyses of the results of 6540 chronic, long-term animal cancer tests (both positive and negative for carcinogenicity) that have been conducted since the 1950's and reported in the general published literature or by the National Cancer Institute and the National Toxicology Program.

The screenshot shows the TOXNET website interface. At the top, there is a banner with the NLM logo and the text "TOXNET Toxicology Data Network". Below the banner, a navigation bar includes links for "TOXNET PDA Access", "SIS Home", "About Us", "Site Map & Search", "Contact Us", "Env. Health & Toxicology", "TOXNET", and "CPDB". The main content area is titled "Carcinogenic Potency Database" and describes the database's purpose. A "List of Chemicals" section features a grid of letters (A-M, N-Z) with "A" highlighted in blue. Below this is a note about color coding. A list of chemical entries follows, each with a blue square icon and a link to its CAS number. To the right, there are two boxes: "Env. Health & Toxicology" (with a "VISIT SITE" button) and "Support Pages" (listing links to Fact Sheet, Sample Record, CPDB Overview, CPDB Methods, and TOXNET FAQ). At the bottom of the page is the URL "toxnet.nlm.nih.gov".

### Searching CPDB

Search by chemical name or fragment, or Chemical Abstracts Service Registry Number. Results include a summary for each sex-species tested, including carcinogenicity, target organs, and carcinogenic potency values. Detailed results from each experiment on that particular chemical are given in a plot format suitable for screen viewing.

### Additional Resource

For further information, we recommend this additional resource:

- ▶ [Carcinogenic Potency Database Fact Sheet](#)  
[www.nlm.nih.gov/pubs/factsheets/cpdbcfs.html](http://www.nlm.nih.gov/pubs/factsheets/cpdbcfs.html)

# Haz-Map

**Haz-Map** is an occupational health database designed for health and safety professionals and for consumers seeking information about the health effects of exposure to chemical and biological agents used in industry, on the job and at home. Haz-Map lists more than 3,200 chemical/biological agents with links to at-risk occupations and approximately 225 associated occupational diseases and their symptoms. The database was compiled from information from occupational medicine textbooks, journal articles, and electronic databases.

**Haz-Map Search** **More Searches** **Haz-Map Help** **Glossary** **References**

**Browse Haz-Map**

- **Hazardous Agents**
  1. [By Types of Agents](#)
  2. [By Adverse Effects](#)
  3. [Alphabetically](#)
- **Occupational Diseases**
  1. [By Types of Diseases](#)
  2. [By Jobs and Symptoms](#)
  3. [Alphabetically](#)
- **High Risk Jobs**
  1. [By Types of Jobs](#)
  2. [Alphabetically](#)

**Agents:** Chemical and biological agents

**Diseases:** Medical conditions and symptoms based on the International Classification of

**Jobs:** High risk jobs and tasks that could result

[hazmap.nlm.nih.gov](http://hazmap.nlm.nih.gov)

## Searching Haz-Map

as

Agent
Disease
Job
Text Search

You can search Haz-Map by keyword, agent, disease, or job from almost any page of the site. Simply enter your query in the search box and click the appropriate button (**Agent**, **Disease**, **Job**, or **Text Search**) to the right of “as.” You can also browse alphabetically in each category or by Types of Agents, Adverse Effects, Types of Diseases, Jobs and Symptoms, or Types of Jobs by clicking the appropriate link (see above).

**Special features for chemical searching:** If there is an exact match of an agent name with the query, the primary record will be returned first in the search results. If the search query is enclosed by double quotes (“”), only the primary record will be displayed. You can also search a chemical by its CAS Registry Number.

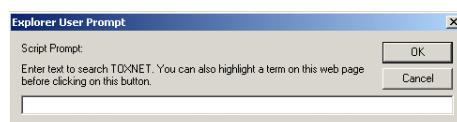
**Other categories:** Click the More Searches tab for additional categories of information, including Activities, Industries, Job Tasks, Processes, and Symptoms. The query words will be searched as text words in the selected category and the results will display in relevancy ranked order.



The screenshot shows the Haz-Map search interface. At the top, there is a navigation bar with tabs: Haz-Map Search, More Searches, Haz-Map Help, Glossary, and References. Below the navigation bar is a search bar with the placeholder text "Search TOXNET". The main content area is titled "Browse Haz-Map" and contains a table with the following data:

Job Task Name	Dye or bleach hair, or use ethanolamines in beauty culture
Comments	Occupational asthma caused by ammonium persulphate, henna, and ethanolamine has been reported. [Malo]
Job Task Category	Beauty Culture
Exposed To	Allergens
Related Information in Haz-Map	
Diseases	Diseases associated with this job task: <ul style="list-style-type: none"> <li>• <a href="#">Asthma, occupational</a></li> </ul>
Jobs	Jobs associated with this job task: <ul style="list-style-type: none"> <li>• <a href="#">Hairdressers, Hair Stylists &amp; Cosmetologists</a></li> </ul>
Industries	Industries associated with this job task: <ul style="list-style-type: none"> <li>• <a href="#">Beauty Salons</a></li> <li>• <a href="#">Cosmetology and Barber Schools</a></li> </ul>

Click the **Search TOXNET** button to search all TOXNET databases. Enter search words in the pop-up prompt box:



## Additional Resources

For further information, we recommend these additional resources:

### [Haz-Map Help](#)

[hazmap.nlm.nih.gov/hazhelp.html](http://hazmap.nlm.nih.gov/hazhelp.html)

### [Haz-Map Brochure](#)

[hazmap.nlm.nih.gov/635906-brochure.pdf](http://hazmap.nlm.nih.gov/635906-brochure.pdf)

### [Sources of Information for Haz-Map](#)

[hazmap.nlm.nih.gov/hazref.html](http://hazmap.nlm.nih.gov/hazref.html)



## Haz-Map Search Exercises

**Search Example: What are some of the occupational diseases associated with working as a biology technician?**

Suggested Solution:

- ▶ Go to [hazmap.nlm.nih.gov](http://hazmap.nlm.nih.gov)
- ▶ Click **By Jobs and Symptoms** under **Occupational Diseases**

- ▶ Select **biology technicians** from the “**Select a job**” pull-down menu
- ▶ Click the **Search** button

- ▶ Review the results
- ▶ Click the **Haz-Map Search** tab to conduct a new search

### Exercise 1: What are some high risk tasks associated with chemical technicians?

Suggested Solution:

Click	<u>Alphabetically under High Risk Jobs</u>
Click	<u>C</u>
Click	<u>Chemical Technicians</u>
Click	the high risk job task of your choice
Review	the information
Click	the <b>Haz-Map Search</b> tab to prepare for the next search

### Exercise 2: What are some of the agents, jobs, and diseases associated with lung cancer? Perform a text search.

Suggested Solution:

Type	<b>lung cancer</b> in the search box
Click	<b>Text Search</b> to the right of the search box
	 Results are sorted in relevancy ranked order.
Scroll	down the page and view the list of records under each category
	 The categories are Agents, Diseases, Jobs, Findings, Activities, Job Tasks and Processes.
Click	the record of your choice under list of <b>Agents</b>
Review	the results
Click	the browser's <b>Back</b> button to return to the Search Results Page
	 Repeats steps above to view lists of diseases and jobs.

### Exercise 3: How can I find information on hazardous agents used in painting?

Suggested Solution:

Click	the <b>More Searches</b> tab
Click	<u>By Types of Processes</u> (under <b>Processes</b> )
Click	<u>Paint</u>
Click	<u>Painting (Solvents)</u>
Review	the record

# Household Products Database

Household Products Database contains links for over 9,000 consumer brands of household products to health effects from Material Safety Data Sheets (MSDS) provided by the manufacturers.

The screenshot shows the homepage of the Household Products Database. At the top, there is a navigation toolbar with links for Home, Products, Manufacturers, Ingredients, and Health Effects. The Health Effects tab is highlighted with a red box and a red arrow pointing to it from the label 'Navigation Toolbar' on the right. Below the toolbar, there is a search bar with a 'Quick Search' field and a 'Go' button. A red box and a red arrow point to the 'Advanced Search' link in the search bar area from the label 'Advanced Search' on the left. To the right of the search bar, there is a section titled 'What's under your kitchen sink, in your garage, in your bathroom, and on the shelves in your laundry room? Learn more about what's in these products, about potential health effects, and about safety and handling.' This section features a grid of nine categories: Auto Products, Inside the Home, Pesticides, Landscape/Yard, Personal Care, Home Maintenance, Arts & Crafts, Pet Care, and Home Office. Each category has a small image and a list of products. At the bottom of the page, there is a footer with links for Home, Products, Manufacturers, Ingredients, and Health Effects, and a 'More Resources' link. A red box and a red arrow point to the 'More Resources' link from the label 'More Resources' on the left. The URL 'hpd.nlm.nih.gov' is displayed at the bottom center of the page.

Household Products Database is designed to help answer the following typical questions:

- What are the chemical ingredients and their percentage in specific brands?
- Which products contain specific chemical ingredients?
- Who manufactures a specific brand? How do I contact this manufacturer?
- What are the acute and chronic effects of chemical ingredients in a specific brand?
- What other information is available about chemicals in the toxicology-related databases of the National Library of Medicine?

## Searching Household Products Database

The Household Products Database is divided into four categories: **Products**, **Manufacturers**, **Ingredients**, and **Health Effects**. Navigate to a category by clicking the appropriate tab at the top of the page.

Search Household Products by using the Quick Search box on the home page or by selecting the Advanced Search link for a more detailed search. Clicking the **Health Effects** tab will bring up the Advanced Search screen with the Health Effects category selected for searching.

Browse Household Products by product category or alphabetically by product names, types of products, manufacturers, or ingredients (see left sidebar).

## Additional Resources

For further information, we recommend these additional resources:

### MSDS Information Resources

- [SIRI MSDS Archive](#)  
hazard.com/msds
- [MSDSprovider: Free Access to Manufacturer-Direct MSDSs](#)  
www.msdsprovider.com

### Government Information Resources

- [OSHA's MSDS Regulation – Hazard Communication 1910.1200](#)  
osha.gov/pls/oshaweb/owadisp.show\_document?p\_table=STANDARDS&p\_id=10099&p\_text\_version=FALSE
- [Read the Label First! Campaign \(EPA\)](#)  
www.epa.gov/oppt labeling/pubs/campaign.htm
- [Household Hazardous Waste \(EPA\)](#)  
www.epa.gov/epawaste/conserve/materials/hhw.htm

### From the National Library of Medicine

- [TOXNET—databases in toxicology and environmental health](#)  
toxnet.nlm.nih.gov
- [Tox Town—an interactive guide to commonly encountered toxic substances](#)  
toxtown.nlm.nih.gov

### Product Recalls

- [Product Safety and Recall Lists](#)  
hpd.nlm.nih.gov/recalls.htm



# Household Products Database Search Exercises

## Search Example: What household products are associated with asthma?

Suggested Solution:

- ▶ Go to [hpd.nlm.nih.gov](http://hpd.nlm.nih.gov)
- ▶ Click the **Health Effects** tab

- ▶ Type **asthma** in the search box
- ▶ Click the **Search** button

- ▶ Click a product of your choice and review the information under **Health Effects**
- ▶ Click the **Home** tab at the top of the page to prepare for the next search

## Exercise 1: How do I do a quick search to find information on herbicides?

Suggested Solution:

Type	<b>herbicide</b> in the search box
Click	the <b>Go</b> button
Review	record(s) of your choice
Click	the <b>Home</b> tab to prepare for the next search

**Exercise 2: What home maintenance products contain *calcium sulfate*?**

Suggested Solution:

- Click the **Ingredients** tab
- Click C
- Click calcium sulfate
- Click the brand name of your choice and review the record
- Click the **Home** tab to prepare for the next search

**Exercise 3: How can I find information about specific brands of antibacterial hand soap, including their manufacturing information, ingredients, and health effects?**

Suggested Solution:

- Click the **Personal Care** category
- Click Soap
- Click Antibacterial in the **Type** column
- Click a **Product Name** of your choice
- Review the information

This page is intentionally blank.

# Additional Resources





## Selected Resources in Environmental Health and Toxicology

### Biostatistics and Epidemiology

Bureau of Labor Statistics (BLS) ..... stats.bls.gov  
CDC Wonder ..... wonder.cdc.gov  
Centers for Disease Control and Prevention (CDC) ..... cdc.gov  
Comprehensive Epidemiologic Data Resource (CEDR) ..... <https://www.orau.gov/cedr>  
*Morbidity and Mortality Weekly Report* (MMWR) ..... cdc.gov/mmwr/mmwr.html  
National Center for Health Statistics (NCHS) ..... cdc.gov/nchs  
World Health Organization (WHO) ..... who.int

### Bioterrorism and Disaster Medicine

Institute for Biosecurity ..... bioterrorism.slu.edu  
Radiation Emergency Medical Management (REMM) ..... remm.nlm.gov

### Consumer Information

American Lung Association (ALA) ..... lungusa.org  
Environmental Health Clearinghouse ..... infoventures.com  
Federal Citizen Information Center (FCIC) ..... pueblo.gsa.gov  
U.S. Consumer Product Safety Commission (CPSC) ..... cpsc.gov

### Environmental Health

American Lung Association (ALA) ..... lungusa.org  
American Public Health Association (APHA) ..... apha.org  
American Public Works Association (APWA) ..... apwa.net  
Comprehensive Epidemiologic Data Resource (CEDR) ..... <https://www.orau.gov/cedr>  
Duke Occupational & Environmental Medicine ..... dukeoccmed.mc.duke.edu  
Enviro-Net (Southeast U.S.) ..... enviro-net.com  
Environmental Fate Databases & more (from Syracuse Research Corporation) ..... [syrres.com/Esc/efdb.htm](http://syrres.com/Esc/efdb.htm)  
Environmental Health Clearinghouse ..... infoventures.com  
Environmental Protection Agency (EPA) ..... epa.gov  
Environmental Protection Magazine Online ..... eponline.com

**Free Full Text Health Science/Medical Journals**

from the National Library of Medicine) .....	sis.nlm.nih.gov/pdf/FreeFullTextListApril07.pdf
International Agency for Research on Cancer (IARC) .....	iarc.fr
National Center for Environmental Health (NCEH).....	cdc.gov/nceh
National Environmental Data Index (NEDI) .....	nedi.gov
National Institute of Environmental Health Sciences (NIEHS) .....	niehs.nih.gov
NIH RePORTER (Research Portfolio online Reporting Tools) ..	projectreporter.nih.gov/reporter.cfm
Office of Environmental Management (EM).....	em.doe.gov
Organisation for Economic Co-operation and Development's (OECD's) Work on Environment, Health and Safety.....	oecd.org/ehs
Specialized Information Services (SIS), National Library of Medicine (NLM).....	sis.nlm.nih.gov
United Nations Environment Programme (UNEP) .....	unep.org
Water Resources of the United States .....	water.usgs.gov
World Health Organization (WHO) .....	who.int

**General Information**

FedWorld (Federal government information locator from the National Technical Information Service [NTIS]) .....	fedworld.gov
The National Academies .....	nas.edu
National Agricultural Library (NAL).....	nalusda.gov
National Institutes of Health (NIH).....	nih.gov
National Library of Medicine (NLM) .....	nlm.nih.gov
U.S. Department of Energy (DOE) .....	energy.gov
U.S. Department of Health & Human Services (DHHS).....	dhhs.gov
U.S. Department of Labor (DOL).....	dol.gov
U.S. Department of Transportation (DOT).....	dot.gov
World Health Organization (WHO) .....	who.int

**Genetic Information**

Genetics Home Reference .....	ghr.nlm.nih.gov
Human Genome Resources.....	ncbi.nlm.nih.gov/projects/genome/guide/human/
National Human Genome Research Institute .....	genome.gov/11510197
Office of Rare Diseases (NIH).....	rarediseases.info.nih.gov

## Occupational Health and Safety

American Industrial Hygiene Association (AIHA) ..... aiha.org

Bureau of Labor Statistics (BLS) ..... stats.bls.gov

Canadian Centre for Occupational Health and Safety (CCOHS) ..... ccohs.ca

Duke Occupational & Environmental Medicine ..... dukeoccmed.mc.duke.edu

Finnish Institute of Occupational Health (FIOH) ..... ttl.fi/en

Health and Safety Executive (HSE) ..... hse.gov.uk

Injury Control Resource Information Network (ICRIN) ..... injurycontrol.com/icrin

International Occupational Safety  
and Health Information Centre (CIS) ..... ilo.org/public/english/protection/safework/cis/

International Programme for Chemical Safety (IPCS) INCHEM ..... inchem.org

Laboratory Chemical Safety Summaries (LCSS) ..... hhmi.org

Mine Safety and Health Administration (MSHA) ..... msha.gov

National Agricultural Library (NAL) ..... nalusda.gov

National Institute for Occupational Safety and Health (NIOSH) ..... cdc.gov/niosh

Occupational Safety and Health Administration (OSHA) ..... osha.gov

OshWeb (Occupational Safety & Health) ..... oshweb.com

Vermont Safety Information Resources, Inc. (SIRI) ..... hazard.com

Where to find Material Safety Data Sheets on the Internet ..... ilpi.com/msds

## Research

International Agency for Research on Cancer (IARC) ..... iarc.fr

Laboratory Chemical Safety Summaries (LCSS) ..... hhmi.org

National Center for Toxicological  
Research (NCTR) ..... fda.gov/AboutFDA/CentersOffices/nctr/default.htm

National Institute of Environmental Health Sciences (NIEHS) ..... niehs.nih.gov

National Institutes of Health (NIH) ..... nih.gov

National Toxicology Program (NTP) ..... ntp-server.niehs.nih.gov

NIH RePORTER (Research Portfolio online Reporting Tools) ... projectreporter.nih.gov/reporter.cfm

Office of Human Radiation Experiments ..... hss.energy.gov/healthsafety/ohre/

Human Subjects Protection Program (Department of Energy) ..... humansubjects.energy.gov/

## Standards

International Organization for Standardization (ISO) ..... iso.ch  
National Standards System Network (NSSN) ..... nssn.org

## Toxicology

Agency for Toxic Substances and Disease Registry (ATSDR) ..... atsdr.cdc.gov  
Canadian Poisonous Plants Information System ..... cbif.gc.ca/pls/pp/poison  
Carcinogenic Potency Project (CPDB) ..... potency.berkeley.edu/cpdb.html  
Center for Food Safety and Applied Nutrition (CFSAN) ..... cfsan.fda.gov  
Chemfinder ..... chembiofinder.cambridgesoft.com  
Comprehensive Epidemiologic Data Resource (CEDR) ..... https://www.orau.gov/cedr  
Food and Drug Administration (FDA) ..... fda.gov  
Human Subjects Protection Program (Department of Energy) ..... humansubjects.energy.gov/  
Injury Control Resource Information Network (ICRIN) ..... injurycontrol.com/icrin  
International Agency for Research on Cancer (IARC) ..... iarc.fr  
Laboratory Chemical Safety Summaries (LCSS) ..... hhmi.org  
National Center for Toxicological Research (NCTR) ..... fda.gov/AboutFDA/CentersOffices/nctr/default.htm  
National Toxicology Program (NTP) ..... ntp-server.niehs.nih.gov  
NIH RePORTER (Research Portfolio online Reporting Tools) .. projectreporter.nih.gov/reporter.cfm  
Office of Human Radiation Experiments ..... hss.energy.gov/healthsafety/ohre/  
Organisation for Economic Co-operation and Development's (OECD's)  
Work on Environment, Health and Safety ..... oecd.org/ehs  
Pesticide Action Network Pesticide Database (PAN) ..... pesticideinfo.org  
Specialized Information Services (SIS), National Library of Medicine (NLM) ..... sis.nlm.nih.gov  
United Nations Environment Programme (UNEP) ..... unep.org  
U.S. Department of Transportation (DOT) ..... dot.gov  
Vermont Safety Information Resources, Inc. (SIRI) ..... hazard.com

## Selected Commercial Web Sites and Databases on Environmental Health and Toxicology-Related Information

### **Ariel WebInsight**—[3ecompany.com/products-services/decision-support-tools/ariel-webinsight/](http://3ecompany.com/products-services/decision-support-tools/ariel-webinsight/)

A subscription-based online chemical regulatory compliance reference tool with an easy-to-use interface with robust search, query, reporting and analysis features. Ariel WebInsight provides access to current, accurate, comprehensive global regulatory data. Available on the 3E Online® platform. Ariel Research Corporation is now a part of the 3E Company. (<http://www.3ecompany.com>)

### **BIOSIS Previews**—[scientific.thomson.com/products/bp](http://scientific.thomson.com/products/bp)

Provided by Thomson Scientific, BIOSIS Previews is a comprehensive reference tool for finding life sciences references worldwide. Includes abstracts and indexes on information from more than 5,500 sources around the world.

### **Chemical Abstracts Service (CAS)**—[cas.org](http://cas.org) or <http://stnweb.cas.org>

The CAS, a division of the American Chemical Society, provides scientists online and Web access to chemistry-related research data. The **CAS Registry** is the largest and most current database of chemical substance information in the world. The Registry covers substances identified from the scientific literature from 1957 to the present, with additional substances going back to the early 1900s, and it now contains records for organic and inorganic substances and sequences.

### **CCINFOweb**—[ccinfoweb.ccohs.ca](http://ccinfoweb.ccohs.ca)

The Canadian Centre for Occupational Health and Safety's Web Information Service provides one-step searching across all of their database collections. The service requires an annual subscription. However, additional resources on the site are free including IPCS INCHEM (publications on chemicals from United Nations agencies) and CHEMINDEX (access to various chemical names for a particular substance).

### **CIS Bibliographic Database (COSDOC/CISILO)**— [ilo.org/public/english/protection/safework/cis/products/cisdoc.htm](http://ilo.org/public/english/protection/safework/cis/products/cisdoc.htm)

From the International Labour Office, the CIS bibliographic database contains citations of documents that deal with occupational accidents and diseases as well as ways of preventing them. The types of documents are: laws and regulations, chemical safety data sheets, training material, articles from periodical publications, books and standards. Every record contains a detailed bibliographic description, a full abstract and indexing descriptors drawn from the CIS Thesaurus. The CISDOC database is updated on a continuous basis. Also searchable as a subfile in TOXLINE (<http://toxnet.nlm.nih.gov>).

**EMBASE.com—[embase.com](http://www.embase.com)**

Provides users with content including the latest scientific developments in biomedical and pharmacological information. From Elsevier.

**Dialog®—[dialog.com](http://www.dialog.com)**

Content areas include government regulations, social sciences, food and agriculture, energy and environment, chemicals, pharmaceuticals, and medicine. See the Dialog Bluesheets for guides on every database in the Dialog service. Enviroline® specifically covers environmental information. (<http://library.dialog.com/bluesheets/html/bl0040.html>)

**MICROMEDEX—[micromedex.com](http://www.micromedex.com)**

MICROMEDEX databases provide access to health care information; information on health, safety and environment in the corporate world; USP DI® updates; and P&T QUIK® reports.

**ScienceDirect®—[sciencedirect.com](http://www.sciencedirect.com)**

ScienceDirect contains over 25% of the world's science, technology and medicine full text and bibliographic information with a journal collection of over 2,500 titles.

**Cambridge Scientific Abstracts (CSA)—[csa.com](http://www.csa.com)**

CSA is a worldwide information company specializing in publishing and distributing—in print and electronically—bibliographic and full-text journals in the areas of natural sciences, social sciences, arts & humanities, and technology. The databases are searchable via CSA Illumina. Also offers Ulrich's Serials Analysis System.

**Thomson Scientific—[isinet.com](http://www.isinet.com)**

Formerly known as Thomson ISI. Their Web of Science® product provides access to current and retrospective multidisciplinary information from approximately 8,700 prestigious, high impact research journals from across the world and offers cited reference searching.

**Environment Abstracts – CIS—[lexisnexis.com](http://www.lexisnexis.com)**

LexisNexis® is a leading provider of information and services solutions, including its flagship Web-based Lexis® and Nexis® research services, to a wide range of professionals in the legal, risk management, corporate, government, law enforcement, accounting and academic market.

## Selected World Wide Web Resources Search Exercises

### 1. Environmental Protection Agency (EPA)

epa.gov

Explore the EPA's Web Site, particularly the **Databases and Software** section on the **Science and Technology** page (see link on top of page). Locate the following:

- IRIS
- ECOTOX
- Toxics Release Inventory
- Safe Drinking Water Information System

Use the [Advanced Search](#) function to find documents with titles containing *radon*.

### 2. Food and Drug Administration (FDA)

fda.gov

Find recall information on products manufactured by Robert's American Gourmet.

### 3. National Toxicology Program (NTP)

ntp-server.niehs.nih.gov/

Is *Thorium Dioxide* on the list **Known to be Human Carcinogens** in the NTP's **Report of Carcinogens**?

### 4. Agency for Toxic Substances and Disease Registry (ATSDR)

atsdr.cdc.gov

Find the ATSDR's **TOXFAQ** profile on *iodine*.

### 5. National Council for Science and the Environment (NCSE)

ncseonline.org

Find recent Congressional Research Service reports on pesticides. Look in the **Earth Portal** section.

### 6. Society of Toxicology (SOT)

toxicology.org

Does Oregon State University offer a doctorate program in toxicology? Look in the SOT's *Resource Guide to Careers in Toxicology*.

**7. ChemFinder**

[chemfinder.com](http://chemfinder.com)

Explore the variety of data sources containing information on nitrous oxide.

**8. Society of Environmental Toxicology and Chemistry (SETAC)**

[setac.org](http://setac.org)

Where and on what dates will the SETAC Europe 21<sup>st</sup> Annual Meeting be held?

**9. Scorecard (from Environmental Defense)**

[scorecard.org](http://scorecard.org)

Which countries have the greatest number of high risk of lead toxics/lead hazards? Housing Units in the U.S.?

**10. BIOLOG (from Syracuse Research Corporation's Environmental Fate Databases)**

[syrres.com/esc/efdb.htm](http://syrres.com/esc/efdb.htm)

Use the BIOLOG file (one of Syracuse Research Corporation's Environmental Fate Data Bases –EFDB) to find references on *petroleum* in soil.

# Environmental Health & Toxicology Portal Decision Tree



The National Library of Medicine **Environmental Health and Toxicology Portal** provides access to many resources. The following chart is a guide to selecting the appropriate resource or database depending on user information needs. Database and resource links can be accessed at: [sis.nlm.nih.gov/enviro.html](http://sis.nlm.nih.gov/enviro.html).

**Use this Decision Tree to choose the correct database or resource:**

FOR THE FOLLOWING TYPE OF INFORMATION:	GO TO:
Journal references to toxicology literature including developmental/reproductive and teratology (birth defects) information	TOXLINE or DART
Summary of peer-reviewed human health effects and emergency medical treatment for chemicals	HSDB
Animal Toxicity Studies	HSDB
Environmental Fate, Exposure, Standards and Regulations	HSDB
Chemical/Physical properties and safety/handling/disposal of chemicals	HSDB
Manufacturing, formulation and use of chemicals	HSDB
Chemical names and synonyms	ChemIDplus or HSDB
Chemical structures and structure searching/drawing capability	ChemIDplus
InChI and/or SMILES structure notations	ChemIDplus
List of links to NLM/NIH and other government agency information for a single chemical	ChemIDplus
Carcinogenicity, mutagenicity, tumor promotion and tumor inhibition data from the National Cancer Institute (NCI)	CCRIS
Peer-reviewed mutagenicity test data from the U.S. Environmental Protection Agency (EPA) including species, type of assay, test result and more	GENE-TOX
Hazard identification and dose-response risk assessment information from the U.S. EPA	IRIS
Cancer and noncancer oral and inhalation risk values and types from government and independent risk information groups worldwide	ITER

FOR THE FOLLOWING TYPE OF INFORMATION:	GO TO:
Results and analyses of chronic and long-term animal cancer test from NCI, the National Toxicology Program (NTP) and the general published literature	CPDB
Drug information related specifically to breastfeeding mothers and their nursing infants including maternal/infant drug levels, possible effects and more	LactMed
Environmental releases of chemicals and waste management activities reported by facilities to the U.S. EPA	TRI
Electronic maps of chemical releases, Superfund sites, health, census, income data and more	TOXMAP
Chemicals, occupations, job tasks, and associated diseases/conditions	Haz-Map
Safety and health information for products used in and around the home	Household Products Database
Material Safety Data Sheets (MSDS) and consumer product recalls	Household Products Database
Interactive website on toxic chemicals and environmental health concerns in the community	ToxTown
Bibliography on alternatives to animal testing in biomedical research	ALTBIB
Selected links to internet resources on environmental issues of special interest	Enviro-Health Links
Online tutorials on basic toxicology principles and concepts	Toxicology Tutorials
Interactive children's learning site about household chemical hazards	ToxMystery

## Contacting the National Library of Medicine for Database Assistance

Toll-free: 888-FIND-NLM (346-3656)

E-mail: [custserv@nlm.nih.gov](mailto:custserv@nlm.nih.gov)

TOXNET E-mail: [tehip@teh.nlm.nih.gov](mailto:tehip@teh.nlm.nih.gov)

### Online Resources

Online Training Manuals	<a href="http://www.nlm.nih.gov/pubs/web_based.htm">www.nlm.nih.gov/pubs/web_based.htm</a> (ClinicalTrials.gov, NLM Gateway, PubMed, TOXNET)
Tutorials	<a href="http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/">www.nlm.nih.gov/bsd/disted/pubmedtutorial/</a> (PubMed)
Fact Sheets	<a href="http://www.nlm.nih.gov/pubs/factsheets/factsheets.html">www.nlm.nih.gov/pubs/factsheets/factsheets.html</a>
Frequently Asked Questions	<a href="http://www.nlm.nih.gov/services/faq.html">www.nlm.nih.gov/services/faq.html</a>

See also Help and FAQ links on each database home page.

## The National Network of Libraries of Medicine

Toll-free number for all Regional Medical Libraries: 800-338-7657

Monday-Friday 8:30 a.m. – 5:00 p.m. in all time zones

Web site: [nnlm.gov](http://nnlm.gov)

