



Published in final edited form as:

Med Ref Serv Q. 2007 ; 26(3): 21–45. doi:10.1300/J115v26n03_02.

Environmental Health and Toxicology Resources of the United States National Library of Medicine

Colette Hochstein, Stacey Arnesen, and Jeanne Goshorn

Division of Specialized Information Services (SIS), National Library of Medicine, 6707 Democracy Boulevard, Bethesda, MD 20892

Abstract

For over 40 years, the National Library of Medicine's (NLM) Toxicology and Environmental Health Information Program (TEHIP) has worked to organize and to provide access to an extensive array of environmental health and toxicology resources. During these years, the TEHIP program has evolved from a handful of databases developed primarily for researchers to a broad range of products and services that also serve industry, students, and the general public. TEHIP's resources include TOXNET® <<http://toxnet.nlm.nih.gov>>, a collection of databases, including online handbooks, bibliographic references, information on the release of chemicals in the environment, and a chemical dictionary. TEHIP also produces several resources aimed towards the general public, such as the Household Products Database <<http://hpd.nlm.nih.gov>>, which helps users explore chemicals often found in common household products, and Tox Town® <<http://toxtown.nlm.nih.gov>>, an interactive guide to commonly encountered toxic substances, health, and the environment. This paper introduces some of NLM's environmental health and toxicology resources.

Keywords

Toxicology; environment; environmental health; chemicals; databanks; databases; hazardous substances; health; public health; information services; Internet; National Library of Medicine (U.S.); Specialized Information Services; TOXNET; TEHIP

INTRODUCTION

It is now widely accepted that a complex relationship exists between the health of the environment and the health of those living in it. In the early 1960s, news about the adverse effects of drugs, pesticides, and other chemicals caused a growing concern about the harmful effects of substances in our food, water, and in the environment. U.S. citizens called on their government to provide information about environmental issues, including potential human health effects. During that time, the National Institutes of Health completed a study about the effects of environmental chemical contaminants. This in turn prompted the President's Science Advisory Committee (PSAC) to formally identify "an urgent need for a much more coordinated and more complete computer-based file of toxicology information than any currently available," and to make "access to this file ... more generally available to all those legitimately needing such information."¹

Colette Hochstein, DMD, MLS (colette@nlm.nih.gov) is Technical Information Specialist; Stacey Arnesen, MS (stacey_arnesen@nlm.nih.gov) is Advisor for Special Projects; and Jeanne Goshorn (goshorj@mail.nlm.nih.gov) is Branch Chief, Department of Biomedical Information Services

Responsibility for this effort went to the National Library of Medicine (NLM), the world's largest medical library, and a leader in the selection, acquisition, organization, and provision of medically related literature and data. NLM is part of the National Institutes of Health (NIH), within the Department of Health & Human Services (HHS). Its Toxicology and Environmental Health Information Program (TEHIP), mandated by the legislative response to the PSAC report, became part of NLM's Division of Specialized Information Services (SIS). (For a list of federal government acronyms used in this document with their expansions, see Table 1.)

"Pre-dating as it did by 3 years the formation of the Environmental Protection Agency (EPA) and the slew of other agencies to follow in EPA's wake, and the whirlwind of environmental legislation and regulations that were to ensue and continue to be drafted to this day, TEHIP took an early lead in gathering and organizing environmental health data, particularly as they relate to chemicals..."² Over the last 40 years, the TEHIP program has evolved from a handful of databases developed primarily for researchers and health professionals to a broad range of products and services that also serve industry, students, and the general public. Today, "a wealth of information is available to searchers of the medical literature through the programs of ... TEHIP."³

BACKGROUND

The TEHIP Web site (see Figure 1) is a portal for environmental health and toxicology information <<http://tox.nlm.nih.gov>>. It can be accessed via the "Environmental Health & Toxicology" link on the left side of the National Library of Medicine's <<http://www.nlm.nih.gov>> home page. The site provides access to an extensive collection of databases and other Web-based resources that cover a wide range of environmental health and toxicology topics, including information on the health effects of almost 400,000 chemicals and drugs. These resources include bibliographic databases, online toxicology handbooks, chemical and drug dictionaries, directories, "weblographies" (lists of Web sites about a subject), and toxicology tutorials. A "quick tour" introduction to its resources is also provided <<http://sis.nlm.nih.gov/enviro/captivate/tehipoverview.htm>>.

To help guide users who are not familiar with the subject area and/or the resources, the TEHIP page is organized by "Audience" and by "Topic." For example, selecting the "Especially for the Public" link provides suggestions and descriptions of NLM's TEHIP resources that are directed to health care consumers, such as Tox Town <<http://toxtown.nlm.nih.gov>>, the Household Products Database <<http://hpd.nlm.nih.gov>>, and the "Poisoning, Toxicology, Environmental Health" topic in MedlinePlus <<http://www.nlm.nih.gov/medlineplus/poisoningtoxicologyenvironmentalhealth.html>>. Those interested in the scientific literature can click on either "Especially for Health Professionals" or on "Especially for Researchers" on TEHIP and again find descriptions of suggested resources for these audiences such as the Hazardous Substances Data Bank and TOXLINE®.

For those interested in investigating specific topics, TEHIP provides suggestions for NLM resources related to some of the most common subjects: Chemicals and Drugs, Diseases and the Environment, Environmental Health, Occupational Safety and Health, Poisoning, Risk Assessment and Regulations, Toxicology, Pesticide Exposure. For example, users interested in Risk Assessment and Regulations are presented with several possible starting points, including the International Toxicity Estimates for Risk Assessment (ITER), with risk information for over 600 chemicals from authoritative groups worldwide <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?iter.htm>>; the Integrated Risk Information System (IRIS), for hazard identification and dose-response assessments for over 500 chemicals <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?IRIS>>; and the Hazardous Substances Data

Bank (HSDB®), with comprehensive, peer-reviewed toxicological data for over 5,000 substances <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>>. Most of these resources can also be explored via the TOXNET search box on the right side of the TEHIP home page, as well as on individual Topic and Audience pages.

The TEHIP page also provides links to “Reference Tools,” which includes an A to Z list of NLM Resources in Environmental Health and Toxicology <<http://sis.nlm.nih.gov/enviro/enviroatoz.html>>, the TOXNET Database Manual <<http://sis.nlm.nih.gov/enviro/manuals.html>>, and Frequently Asked Questions (FAQ) on finding environmental health and toxicology information <<http://sis.nlm.nih.gov/faqlist.html>>.

TOXNET

One of TEHIP’s major resources is the Toxicology Data Network, or TOXNET <<http://toxnet.nlm.nih.gov>>, an extensive collection of bibliographic, research, and consumer health information in the areas of toxicology and environmental health (see Figure 2). TOXNET provides access to references, excerpts from the scientific literature, and risk assessment information in a number of online handbooks and databases related to the adverse effects of chemicals and other agents.

Seven of the databases within TOXNET are made up of chemical records, with one record per chemical (see Table 2 for a guide to resources mentioned in this article).

For information about a specific chemical or drug, TOXNET’s Chem-IDplus® <<http://chem.sis.nlm.nih.gov/chemidplus>> can be used to locate data about a chemical or drug with or without its official chemical name. Although the Chemical Abstracts Service (CAS) <<http://www.cas.org>> assigns unique Registry Numbers (RN) to them, chemical substances are often still known by more than one name. ChemIDplus allows users to search by any name to identify chemical substances cited in TOXNET and other NLM databases. The database contains almost 400,000 chemical records of which almost 300,000 include chemical structures. ChemID is searchable by CAS Registry Number, synonym, molecular formula, classification code, locator code, and structure.

ChemIDplus “Lite” can be used for simple name, synonym, and RN searching. A spell checker provides users with suggestions when an unrecognized chemical name is entered. ChemID’s “Locator Codes” feature allows users to obtain more information about each chemical with links to NLM and several other databases and resources via a pre-formulated search for the chemical.

ChemIDplus “Advanced” allows chemical structure and biological/chemical property searches; it requires a drawing and display plugin/applet for viewing chemical structures (users can either draw their own structure or pull in a structure that has already been retrieved). ChemID provides three types of structure searches: substructure, similarity, and exact structure. A substructure search looks for the drawn (or transferred) structure embedded in the structures of other compounds. This is useful for finding a set of compounds that share a common “substructure” which may cause similar biological activity. A similarity search looks for other compounds with structural features that are similar to those of the drawn or transferred structure. This is useful for finding a set of compounds that share a common substructure which may cause similar biological activity. To assist with structure searching, ChemIDplus provides two options that eliminate the need to draw the structure. “Use Structure for Query” pastes the retrieved structure from a previous query into the structure input box. “Use Structure for Similarity” starts an immediate search for similar structures.

TOXLINE

TOXLINE <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?TOXLINE>> is NLM's bibliographic database for the toxicology literature. TOXLINE includes references on the biochemical, pharmacological, physiological, and toxicological effects of drugs and other chemicals (see Figure 3). It contains over three million citations, most with abstracts and/or indexing terms and CAS Registry Numbers. TOXLINE references come from a variety of sources that are organized into component files that are typically searched together but which may also be searched separately. One of the major subsets of TOXLINE comes from the "toxicology subset" of journal literature in NLM's MEDLINE®/PubMed®.

TOXLINE covers much of the standard journal literature in toxicology, as well as an assortment of specialized journals and other sources, including meeting abstracts, technical reports, and research in progress. It also offers features such as relevancy ranking, and flexible sorting and downloading options (see Figure 4).

Hazardous Substances Data Bank or HSDB

The Hazardous Substances Data Bank (HSDB) contains comprehensive toxicological data on over 5,000 chemicals. Like ChemIDplus, HSDB <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm>> consists of chemical records, with one record per chemical. The data are organized into categories and data fields/data elements that include human health effects, emergency medical treatment, animal toxicity studies, environmental fate and exposure, standards and regulations, chemical safety and handling, chemical and physical properties, and manufacturing and use information. The information is excerpted from the scientific literature, including handbooks, textbooks, technical reports, and journal articles.

It is particularly important to evaluate the validity and reliability of the summarized data in HSDB, because scientific opinions on the toxicities of certain chemicals often vary widely. For this reason, HSDB data undergoes a rigorous peer review process by the Scientific Review Panel (SRP), a group of 16 scientists and physicians which meets three times a year to examine new or revised HSDB records for accuracy and completeness. Each data statement passing this process is labeled as peer-reviewed. A 'QC Reviewed' tag is used for data which has received a quality control review, but has not yet been reviewed by the Scientific Review Panel. Some data in HSDB statements are labeled with an 'unreviewed' tag. This information includes data that do not lend themselves to review, such as industry data.⁴

HSDB can be considered to be "among the most comprehensive sources of information addressing the toxic effects of substances and their impact on health and the environment."⁵

WISER®

A companion piece to HSDB is called WISER (Wireless Information System for Emergency Responders) (see Figure 5). WISER is designed to assist emergency responders during hazardous material incidents. It is available as a standalone application for Pocket PCs, Palm OS PDAs, and Microsoft Windows PCs. A Web-based WISER (WebWISER) is also offered for when an Internet connection is available.

When handling hazardous material incidents, emergency responders in general, and Hazmat (hazardous materials) units in particular, must make many decisions quickly. They need accurate information about the hazardous substance/s, the emergency resources available, and the surrounding environmental conditions. WISER provides rapid access to the most important information about 400 hazardous substances; comprehensive decision support (including

assistance in identification of an unknown substance and, once the substance is identified, guidance on immediate actions necessary to save lives and protect the environment). It features intuitive, simple, and logical user interfaces developed by working with experienced emergency responders.

CONSUMER RESOURCES

NLM has an interest in exploring new ways to foster better understanding of its resources and databases, and in recent years has followed a government-wide effort to make its information more understandable to the general public. Several of its newer products help to address the toxicology and environmental health information needs of the public. One such resource is the Household Products Database (HPD) <<http://hpd.nlm.nih.gov>> (see Figure 6).

Household Products Database (HPD)

The Household Products Database is a consumer's guide that provides information on the potential safety and health effects of chemicals contained in more than 6,000 common household products used inside and around the home. It helps users investigate ingredients in brand-name products, in what percentage the ingredients are found, which products contain specific chemical ingredients, who manufactures a specific brand, how the manufacturer can be contacted, what the potential adverse health effects (acute and chronic) of the ingredients in a specific brand are, and what other information is available about such chemicals in the toxicology-related databases of NLM.

HPD can be browsed by product categories or by an alphabetical listing of brand names. Products can also be searched by type, manufacturer, ingredient/chemical name, and by health effects. The record for each product shows the ingredients as reported on the product label and/or the manufacturer's Material Safety Data Sheet (MSDS) <<http://hpd.nlm.nih.gov/faq.htm#7>> and includes other information such as handling, disposal, and health effects. For more technical information from other NLM resources, users can launch a search for a product or ingredient in TOXNET from the "Product" page in the database. To learn more about the effects of the chemicals on humans in the published biomedical literature, automated searches of NLM's PubMed are provided from HPD's "Chemical Information Page" (see Figure 7).

Although NLM does not verify whether the information stated is accurate, current, or complete, the Household Products Database is a good free resource that saves users much time and effort from doing the retrieval themselves.⁶

Tox Town

Tox Town <<http://toxtown.nlm.nih.gov>> is an interactive guide to commonly encountered toxic substances and their relationship to human health and the environment. Tox Town helps users explore a town, city, farm, or U.S.-Mexico border community to identify potential environmental hazards; it is recommended for high school and college students, educators, and the concerned public. "Tox Town can also be used to introduce youth and community members to environmental health concepts and raise awareness of, and demand for, quality community planning and building design that can enhance health."⁷

Each Tox Town neighborhood is toured by selecting "Location" or "Chemical" links. For example, a user can click on the hospital in the City scene for a list of chemicals that might be found in a hospital and a list of resources about environmental concerns for hospital patients and staff. Or a user can select a chemical, such as mercury, to see where it might be found in a neighborhood and to learn more about it. Cutaway views give an inside look at the school, a home, and other buildings for more detail (see Figure 8).

Tox Town uses color, graphics, sounds, and animation to convey connections between chemicals, the environment, and the public's health. It is designed to provide facts on everyday locations where toxic chemicals might be found; information about how the environment can affect human health; nontechnical descriptions of chemicals; links to authoritative chemical information on the Internet; and Internet resources on environmental health topics. Tox Town also offers some resources in Spanish <<http://toxtown.nlm.nih.gov/espanol>>.

Tox Town's chemical and environmental information comes from NLM's TOXNET, MedlinePlus® <<http://medlineplus.gov>>, and other authoritative sources such as the U.S. Environmental Protection Agency/EPA <<http://www.epa.gov>> and the U.S. Agency for Toxic Substances and Disease Registry <<http://www.atsdr.cdc.gov>>. Chemical descriptions are based on TOXNET and other resources and are reviewed by NLM toxicology staff.

ToxMystery

ToxMystery <<http://toxmystery.nlm.nih.gov>> is NLM's interactive learning site designed to help children aged 7–10 find clues about toxic substances that may be found in the home (see Figure 9). With lively animations, surprising sound effects, and lots of positive reinforcement, ToxMystery provides a fun, game-like experience, while teaching important lessons about potential environmental health hazards.

Children visiting ToxMystery have an able guide in “Toxie” the cat, who helps find the hazards hidden in each room and offers hints when needed. The objective is to find all the hazards—in the living room, bathroom, garage, and other areas. Players are treated to fun animations when they identify all the hazards in a room. When all the potential hazards in the house have been discovered, Toxie delivers a special celebration, and players can print a personalized certificate of completion.

ToxMystery's “Parent Resources” page provides more detailed information about everyday environmental hazards that can be harmful to one's health. A “For Teachers” page contains more than 10 downloadable activity pages that can be used in elementary school classrooms.

ADDITIONAL NLM RESOURCES

Several of NLM's newer toxicology and environmental health resources can be useful to both scientific and health professionals as well as to the “concerned citizen.” TOXMAP® is one of these resources.

TOXMAP

TOXMAP <<http://toxmap.nlm.nih.gov>> is a Geographic Information System (GIS) that uses maps of the United States, and helps users visually explore data from the EPA's Toxics Release Inventory (TRI) <<http://www.epa.gov/tri/>> and Superfund Programs <<http://www.epa.gov/superfund/index.htm>> (see Figure 10). “TOXMAP provides users with a new way to explore and understand a number of toxicology and environmental health resources. Its distinct approach has been especially useful for developing a resource that engages a technology (GIS) and a subject (hazardous chemicals) that may not be familiar to many users.”⁸

Federal law requires facilities in certain industries that manufacture, process, or use significant amounts of toxic chemicals, to report annually on their releases of these chemicals to the EPA TRI Program. Superfund sites are waste sites in the United States and its territories that contain substances designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or other laws.

TOXMAP helps users create nationwide or local area maps showing where TRI chemicals are released on-site into the air, water, and ground. It also identifies the releasing facilities, color-codes release amounts for each year, and provides multi-year chemical release trends, beginning with 1987, when the TRI Program began. Maps also show locations of Superfund sites on the National Priority List (NPL) <<http://www.epa.gov/superfund/sites/npl>>, listing all chemical contaminants present at these sites. Users can search the system by chemical name, chemical name fragment, and/or location (such as city, state, or ZIP code). TOXMAP also overlays other data onto the maps such as U.S. Census population information, income figures from the Bureau of Economic Analysis, and health data from the National Cancer Institute <<http://www.cancer.gov>> and the National Center for Health Statistics <<http://www.cdc.gov/nchs>>.

Haz-Map®

Haz-Map <<http://hazmap.nlm.nih.gov>> is an occupational health database designed for health and safety professionals and for consumers seeking information about the health effects of exposure to chemicals and biological agents at work. Haz-Map links jobs and hazardous tasks with exposure to chemical and biological agents and occupational diseases and their symptoms (see Figure 11).

Information from textbooks, journal articles, and electronic databases such as NLM's Hazardous Substances Data Bank is classified and summarized to create this resource. The resource's data are compiled by Dr. Jay A. Brown, MD, MPH, who has over 10 years of experience working in occupational medicine.

Some of Haz-Map's features include a search capability; browsing by jobs, diseases, symptoms, or agents; and automated searches of TOXNET. Definitions of technical terms are available by selecting hyperlinks to the glossary. Haz-Map also offers a references section. "The references are divided into broad categories: online books and databases, books and compact discs, journals and monographs, and other Web sites This feature ... expands the universe of available related information."⁹

LactMed

NLM's LactMed <<http://lactmed.nlm.nih.gov>> is a database of drugs and other chemicals to which breastfeeding mothers may be exposed. It includes information on the levels of such substances in breast milk and infant blood, and the possible adverse effects on breastfeeding and in the nursing infant. Statements of the American Academy of Pediatrics concerning a drug's compatibility with breastfeeding are provided, as are suggested therapeutic alternatives to those drugs where appropriate (see Figure 12). The information provided includes a "plain language" summary regarding use of the specified drug during lactation, potential alternative medications, and references that are linked to relevant PubMed records. LactMed data are derived from the scientific literature and are fully referenced and peer-reviewed. Supplemental links to breastfeeding resources from credible organizations are also provided.

Enviro-Health Links

The NLM's Enviro-Health Links Web guides <<http://sis.nlm.nih.gov/enviro/envirohealthlinks.html>> cover toxicology and environmental health topics of recent special interest. The guides include links to information for both the consumer and the professional. Many contain a section on links to laws and policy affecting a topic, for example, regulations having to do with dietary supplement labeling. When possible, the guides have links to relevant books and journal articles that are available for free (see Figure 13).

CONCLUSION

People are increasingly aware of ways in which the environment can affect human health and development. Access to reliable and timely information is vital for understanding potential environmental hazards and to safeguard our health. The National Library of Medicine's Toxicology and Environmental Health Information Program/TEHIP <<http://sis.nlm.nih.gov/enviro.html>> has developed a broad range of environmental health products and services that serve researchers, industry, students, and the general public, and will continue to respond to the need for new information products. In the words of one experienced medical librarian, "The resources of... TEHIP deserve a second look by searchers."¹⁰

FOR MORE INFORMATION

More information about the environmental health and toxicology resources of the National Library of Medicine can be found at: <<http://www.nlm.nih.gov/pubs/factsheets/tehipfs.html>>. The NLM-Tox-Enviro-Health-L e-mail announcement list <<http://sis.nlm.nih.gov/enviro/envirolistserv.html>> broadcasts updates on NLM's toxicology and environmental health resources and services, and outreach in toxicology and environmental health.

The TEHIP RSS (Really Simple Syndication) feed <<http://sis.nlm.nih.gov/rss/sisnewsfeed.rss>> provides information about new resources, updates to NLM toxicology and environmental health databases, and alerts to scientific meetings at which NLM will have exhibits, presentations, or classes.

Questions about these resources can be sent to Dr. Colette Hochstein (colette@nlm.nih.gov) and Ms. Stacey Arnesen (stacey_arnesen@nlm.nih.gov) or to tehip@tehl.nlm.nih.gov.

References

1. United States. Handling of Toxicological Information. White House; Washington, D.C: 1966. President's Science Advisory Committee; p. 10
2. Wexler, Philip. The U.S. National Library of Medicine's Toxicology and Environmental Health Information Program. *Toxicology May;2004* 198(1-3):161-8. [PubMed: 15138039]
3. Fitzpatrick, Roberta Bronson. Resources from the Toxicology and Environmental Health Information Program (TEHIP). *Medical Reference Services Quarterly Summer;2000* 19(2):65-73. [PubMed: 11299649]
4. The National Library of Medicine's Toxicology and Environmental Health -Information Program. Toxicology and Environmental Health Information Resources: The Role of the National Library of Medicine. In: Liverman, Catharyn T.; Ingalls, Carrie E.; Fulco, Carolyn E.; Kipen, Howard M., editors. Committee on Toxicology and Environmental Health Information Resources for Health Professionals [and] Division of Health Promotion and Disease Prevention, Institute of Medicine. Washington, DC: National Academy Press; 1997. p. 38
5. Prasek, Margaret. One-Stop Shopping: The Hazardous Substances Data Bank. *Medical Reference Services Quarterly Winter;1996* 15(4):41-57. [PubMed: 10164468]
6. Fitzpatrick, Roberta Bronson. Are We Safe? NLM's Household Products Database. *Medical Reference Services Quarterly Winter;2004* 23(4):49-59. [PubMed: 15148019]
7. Love, Cynthia B.; Szczur, Martha; Higgins, Mary W.; Aspinwall, Erinn E. Tox Town: An Internet Introduction to Environmental Health and Toxic Chemicals. *Children, Youth and Environments* 2005;15(1):307-17.
8. Hochstein, Colette; Szczur, Martha. TOXMAP: A GIS-Based Gateway to Environmental Health Resources. *Medical Reference Services Quarterly Fall;2006* 25(3):13-31. [PubMed: 16893844]

9. Fitzpatrick, Roberta Bronson. HazMap: Information on Hazardous Chemicals and Occupational Diseases. *Medical Reference Services Quarterly Summer*;2004 23(2):49–56. [PubMed: 15148019]
10. Fitzpatrick, Roberta Bronson. Resources from the Toxicology and Environmental Health Information Program (TEHIP). *Medical Reference Services Quarterly Summer*;2000 19(2):65–73. [PubMed: 11299649]

The screenshot shows the homepage for the Environmental Health and Toxicology Specialized Information Services (SIS). At the top, there is a header for the United States National Library of Medicine, National Institutes of Health, with a search bar and navigation links. Below this is a banner for 'Environmental Health and Toxicology SIS Specialized Information Services' with a family photo and navigation links. The main content area is divided into several sections:

- Topics:** A list of subject areas including Chemicals and Drugs, Diseases and the Environment, Environmental Health, Occupational Safety and Health, Poisoning, Risk Assessment and Regulations, Toxicology, and Pesticide Exposure.
- Especially for:** Targeted resources for The Public, Researchers/Scientists, Health Professionals, Students/Educators, and Emergency Responders.
- Reference Tools:** Includes A to Z List of Resources, Database Manual, News, Calendar of Events, and FAQ List.
- Listserve:** Lists NLM-TOX-ENVIRO-HEALTH-L, WISER (Wireless Information System for Emergency Responders), and MedlinePlus Environmental Health e-mail Announcement List.
- More to Explore:** Features ToxMystery, ToxSeek, Tox Town, Enviro-Health Links, WISER, ALTBIB, Toxicology Tutorials, Toxicology Web Links, Education and Career Links, Fact Sheets, Database Descriptions, MedlinePlus: Consumer Environmental Health Information, DIRLINE@, Public Health Information, Health Services Research & Public Health Information Programs, and TOXNET@.
- TOXNET@:** Describes a collection of databases on hazardous chemicals, toxic releases, and environmental health, with a search bar and a list of databases including ChemIDplus, IRIS, CCRIS, ITER, CART, LactMed, GENE-TOX, TOXLINE, Haz-Map, TOXMAP, Household Products, TRI, and HSDB.
- TOXNET FAQs:** Includes a quick tour of NLM's environmental health and toxicology resources (4 minutes) and a note that the movie uses the Macromedia Flash Player.
- Featured Site:** Promotes ToxMystery, an interactive learning site for kids 7-10 years old, marked as 'NEW!'.
- Footer:** Contains the logo and text for the National Institute of Environmental Health Sciences, identifying it as the primary NIH organization for environmental health research.

FIGURE 1.
TEHIP Home Page

United States National Library of Medicine
TOXNET
Toxicology Data Network

TOXNET PDA Access | SIS Home | About Us | Site Map & Search
Env. Health & Toxicology | TOXNET

TOXNET - Databases on toxicology, hazardous chemicals, environmental health, and toxic releases.

Select Database	Search All Databases	Env. Health & Toxicology
<ul style="list-style-type: none">• ChemIDplus• HSDB• TOXLINE• CCRIS• DART• GENETOX• IRIS• ITER• LactMed• Multi-Database• TRI• Haz-Map• Household Products• TOXMAP	<p>Enter term(s) to search all databases.</p> <input type="text"/> <p>Search Clear Help</p> <p>TOXNET Search Options</p> <ul style="list-style-type: none">• Search all databases: Enter term(s) in box above• Search a specific database: Click database at left• Database description: Click on the [i]	<p>Portal to environmental health and toxicology resources</p> <p>Support Pages</p> <ul style="list-style-type: none">▶ Help▶ TOXNET FAQ▶ TOXNET Update Status▶ Fact Sheet▶ Database Description▶ Training Manuals▶ News

Copyright, Privacy, Accessibility
U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894
National Institutes of Health, Health & Human Services

FIGURE 2.
TOXNET Home Page

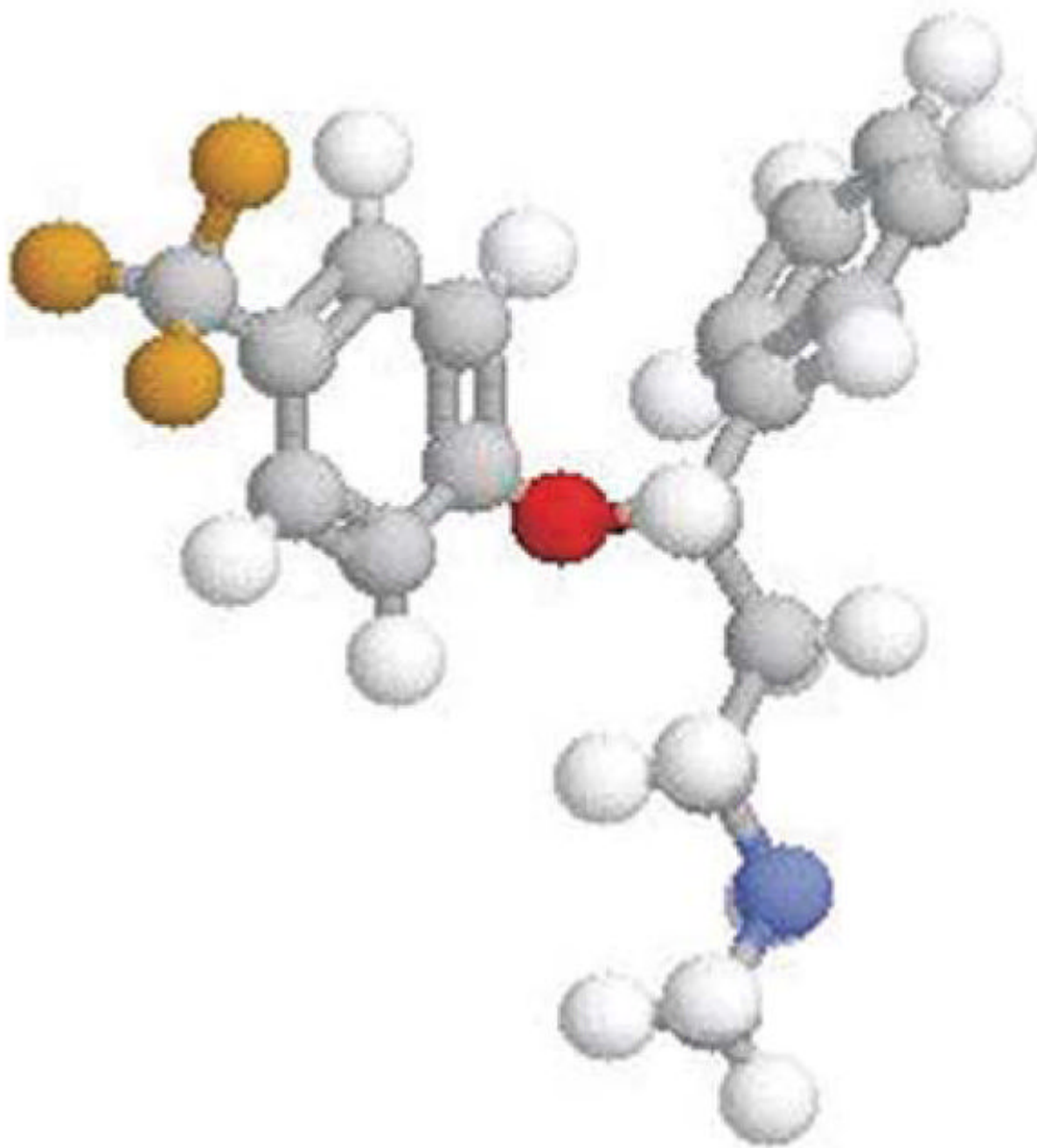


FIGURE 3.
ChemIDplus Prozac Structure

The screenshot displays the TOXNET Toxicology Data Network interface. On the left is a vertical navigation menu with buttons for: Related Records, Search Results, Download, Basic Search, Browse Index, Modify Search, Details, History, Help, and TOXNET Home. The main content area features a search bar with 'arsenic lumber' entered, and buttons for Search, Clear, and Limits. Below the search bar, there are options for adding synonyms and CAS numbers, and a result count of 'Item 12 of 82'. The selected record is titled 'Alternatives to Chromated Copper Arsenate (CCA) for Residential Construction.' and includes the following information:

Author: Letbow S

Author Address: Forest Products Lab., Madison, WI

Source: Govt Reports Announcements & Index (GRI&I), Issue 16, 2004

Abstract:
The treated wood industry is undergoing a major transition as chromated copper arsenate (CCA) is replaced in most residential applications. CCA alternatives have been developed and are becoming more widely available. The alternatives rely heavily on copper as the primary biocide, with a range of co-biocides to help protect against copper-tolerant organisms. Studies indicate that the CCA alternatives do release measurable quantities of copper and co-biocide into the environment. However, these components have lower mammalian toxicity than does arsenic, and they are less likely to raise concerns about environmental impacts. As the treated wood industry evolves, it is likely that a wider range of types and retentions of wood preservatives will become available, with the treatment more closely tailored to a specific type of construction application.

Keywords:
Alternatives
Leaching
Construction materials
Environmental impacts
Lumber
Meetings
Chromated copper arsenate(CCA)
Treated lumber

Order Number: 18p
Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

Price: NTIS Prices: PC A03/MF A01

Entry Month: September, 2004

Year of Publication: 2004

Secondary Source ID: NTIS/PB2004-105407

Document Number: NTIS/01520230

FIGURE 4.
TOXLINE Record

United States National Library of Medicine

Wireless Information System for Emergency Responders

SIS Home About Us Site Map & Search Contact Us

Home
About
WebWISER
Download
- WISER for Windows
- WISER for Pocket PC
- WISER for Palm OS
Join the E-Mail List
Tutorial
Feedback
Technical Support
News

Welcome to WISER

the Wireless Information System for Emergency Responders

WISER is a system designed to assist first responders in hazardous material incidents. WISER provides a wide range of information on hazardous substances, including substance identification support, physical characteristics, human health information, and containment and suppression advice.

Download

Version 2.2 of WISER is available for download.

WISER is available as a standalone application on Pocket PC PDAs, Palm OS PDAs, and Microsoft Windows PCs. **Download for free!**

WebWISER

When an Internet connection is available, use your web browser to access the same functionality of the standalone applications. WebWISER includes support for PDA browsers, including **BlackBerry**, Pocket PC, Palm, and some phones.

Join the E-mail List

Want to get notices of WISER updates and news? Join the WISER List Service (listserv), an automated e-mail list that sends important announcements about WISER.

Please note that the National Library of Medicine does not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed.

Other Hazmat-Related Resources at NLM

MedlinePlus offers trusted links to general health topics:

- Fire Safety
- Disasters & Emergency Preparedness
- Poisoning
- and more...

TOXNET

Household Products Database

Tox Town

Other Environmental Health Topics

Other Hazmat-Related Resources

DOT ERG (Dept. of Transportation Emergency Response Guidebook)

EPA Chemical Fact Sheets

ATSDR ToxFAQs

New Jersey Hazardous Substance Fact Sheets

CHEMTREC

FIGURE 5.
WISER Home Page

Household Products Database

National Institutes of Health
National Library of Medicine
Specialized Information Services



[Home](#) | [Products](#) | [Ingredients](#) | [MSDS](#)
[Browse by Categories](#) | [Browse Alphabetically](#) | [Search](#)

Choose a Product Category



Auto Products

Brake Fluid, De-icer, Lubricant, Sealant, and more...



Inside the Home

Air Freshener, Bleach, Toilet Bowl Cleaner, and more...

Pesticides
Animal Repellant, Fungicide, Herbicide, Insecticide, and more...



Landscape / Yard
Fertilizer, Lawn Care, Swimming Pool Products, and more...



Personal Care / Use

Antiperspirant, Hair Spray, Makeup, Shampoo, Soap, and more...



Home Maintenance

Caulk, Grout, Insulation, Paint, Putty, Stain, and more...

Arts & Crafts
Adhesive, Glaze, Glue, Primer, Varnish, and more...



Pet Care
Flea & Tick Control, Litter, Stain/Odor Remover, and more...



[About](#) | [FAQ](#) | [Product Recalls](#) | [Help](#) | [Glossary](#) | [Contact Us](#) | [Other Resources](#) | [Home](#)

FIGURE 6.
Household Products Database Products

Household Products Database

National Institutes of Health
National Library of Medicine
Specialized Information Services



[Home](#) [Products](#) [Ingredients](#) [MSDS](#)

[Browse Alphabetically](#) Search

Search as Ingredient in

Chemical Information

Chemical Name: Chlorpyrifos

CAS Registry Number: 002921-88-2

Synonyms: Chlorpyrifos-ethyl; O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate; Dursban; Chlorpyrifos [ANSI:BSI:ISO]; O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate; Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) ester; Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridyl) ester

Information from other National Library of Medicine databases

Health Studies: [Human Health Effects from Hazardous Substances Data Bank \(HSDB\)](#)

Toxicity Information: [Search TOXNET](#)

Chemical Information: [Search ChemIDplus](#)

Biomedical References: [Search PubMed](#)

Products that contain this ingredient

Brand	Category	Form	Percent
Bonide Termite & Carpenter Ant Dust	Pesticides	powder	12.6
Raid Ant Bait	Pesticides	solid	0.03
Hot Shot Maxattrax Roach Bait	Pesticides	solid	0.5
Ortho Dursban Lawn & Garden Insect Control	Pesticides	granules	1

FIGURE 7.
Household Products Database Chemical Information Page

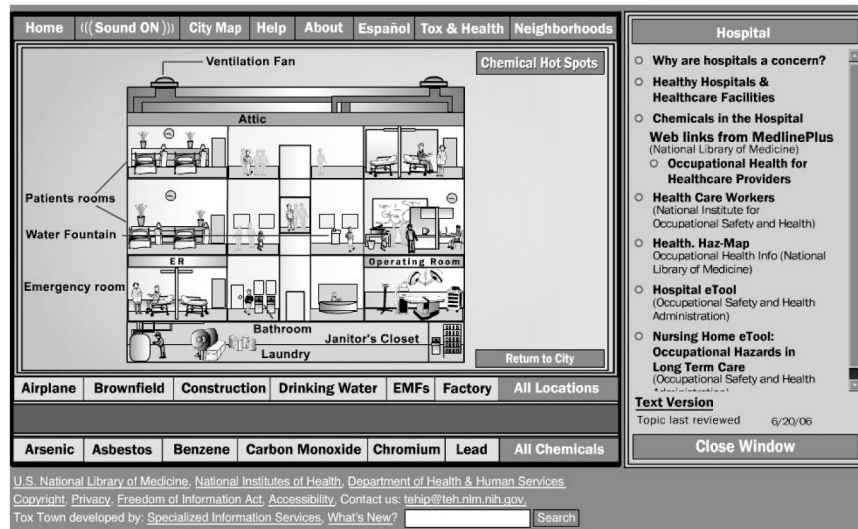


FIGURE 8.
Tox Town Hospital Cutaway View



FIGURE 9.
ToxMystery

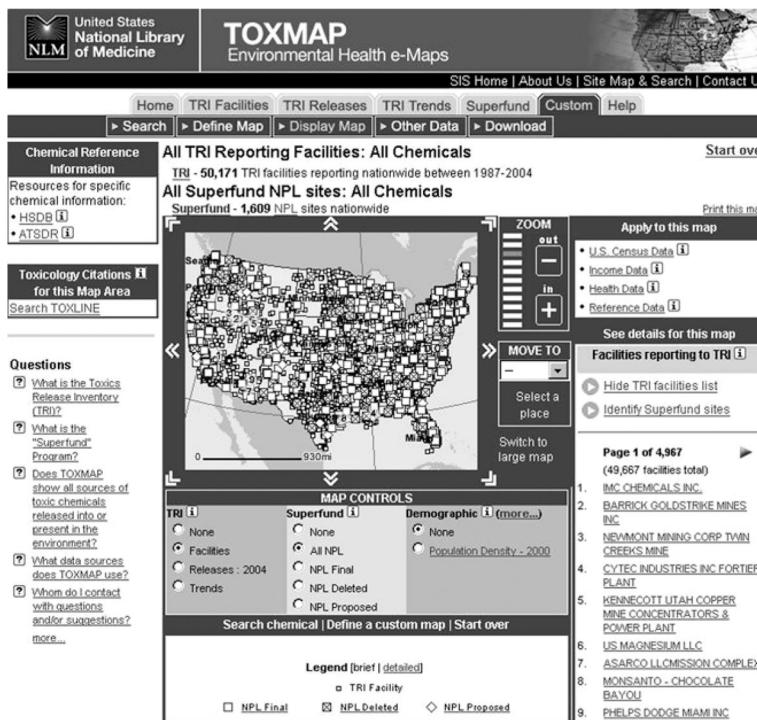


FIGURE 10.
TOXMAP TRI Facilities and Superfund Map



Search as  Agent  Disease  Job  Text Search

[Haz-Map Search](#) [More Searches](#) [Haz-Map Help](#) [Glossary](#) [References](#)

Browse Haz-Map

Search TOXNET



Job Name	Carpenters
Description	Construct, erect, install, or repair structures and fixtures made of wood, such as concrete forms; building frameworks, including partitions, joists, studding, and rafters; wood stairways, window and door frames, and hardwood floors. May also install cabinets, siding, drywall and batt or roll insulation. Include brattice builders who build doors or brattices (ventilation walls or partitions) in underground passageways to control the proper circulation of air through the passageways and to the working places. [SOC] "The nontropical woods (e.g., white pine) used by carpenters rarely cause allergic contact dermatitis." [Marks, p. 314]
Category	Construction
SOC Code	47-2031
Related Information in Haz-Map	
Job Tasks	<p>High risk job tasks associated with this job:</p> <ul style="list-style-type: none"> • Apply arsenic preservatives to wood • Contaminate skin or inhale spray while using pentachlorophenol • Handle agents that cause allergic contact dermatitis or contact urticaria • Installed insulation before 1975 • Machine allergenic wood and inhale dust • Remove insulation installed before 1975 • Saw or sand arsenic-treated wood • Saw or sand creosote-treated wood • Use epoxy, isocyanate, or formaldehyde-resin adhesives, finishes, or sealants • Use n-hexane as a solvent in glues, inks, coatings, or degreasers • Work with glue solvents

FIGURE 11.
Haz-Map Job Record

Drug and Lactation Database

LactMed

Next Item
Search Results
Basic Search
Details
Other Files
Modify Search

Item 1 of 58

Download
Limits
Browse Index
Help

Contents

FULL RECORD
 Drug Levels and Effects
 Summary of Use during Lactation
 Drug Levels
 Effects in Breastfed Infants
 Possible Effects on Lactation
 AAP Category
 Alternate Names to Consider
 References
 Substance Identification
 Substance Name
 CAS Registry Number
 Drug Class
 Administrative Information
 LactMed Record Number
 Last Revision Date

U.S. National Library of Medicine
 8600 Rockville Pike, Bethesda, MD 20894
 National Institutes of Health
 Department of Health & Human Services
 Copyright and Privacy Policy
 Freedom of Information Act, Accessibility
 Customer Service: 1-800-338-8956

Ibuprofen
 CASRN: 15687-27-1
For other data, click on the Table of Contents

Drug Levels and Effects:
Summary of Use during Lactation:
 Because of its extremely low levels in breastmilk, short half-life and use in infants in doses much higher than those excreted in breastmilk, **Ibuprofen** is a preferred choice as an analgesic or antiinflammatory agent in nursing mothers.

Drug Levels:
Maternal Levels. Two early studies attempted measurement of **Ibuprofen** in milk. In one, the patient's dose was 400 mg twice daily, while in the second study of 12 patients, the dose was 400 mg every 6 hours [1][2]. In neither study could **Ibuprofen** be detected in milk. Assay sensitivities were 0.5 and 1 mcg/L, respectively.

A later study using a more sensitive assay method found **Ibuprofen** in the breastmilk of one woman who took 6 doses of 400 mg orally over a 42.5 hours. A milk **Ibuprofen** level of 13 mcg/L was detected 30 minutes after the first dose. The highest level measured was 180 mcg/L about 4 hours after the third dose, 20.5 hours after the first dose. The authors estimated that the infant would receive about 17 mcg/kg daily (100 mcg daily) with the maternal dose of approximately 1.2 g daily. This dose represents 0.0008% of the maternal weight-adjusted dosage[3] and 0.006% of the commonly accepted infant dose of 30 mg/kg daily (10 mg/kg every 8 hours).

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants:
 At least 23 cases are reported in the literature in which infants (age not stated) were breastfed during maternal **Ibuprofen** use with no adverse effects reported [1][3][4].

Possible Effects on Lactation:
 Relevant published information was not found as of the revision date.

AAP Category:
 Usually compatible with breastfeeding [5]

FIGURE 12.
LactMed Ibuprofen Record

The screenshot shows the 'Environmental Health and Toxicology' website. At the top, there is a header with the title and a navigation bar containing 'SIS Home', 'About Us', 'Site Map & Search', and 'Contact Us'. Below the header, the page title is 'Enviro-Health Links'. A sub-header reads: 'Selected links to Internet resources on toxicology and environmental health issues of recent special interest. To learn about the criteria used to evaluate links outside the National Library of Medicine please review the selection criteria'. The main content area is a list of links, each with a right-pointing arrow and a brief description:

- American Indian Health**: An information portal to issues affecting the health and well-being of American Indians in the United States
- Arctic Health**: An information portal to issues affecting the health and well-being of our planet's northern-most inhabitants
- Arsenic and Human Health**: A chemical toxic to humans and found in some everyday places and things
- Asian American Health Web Site**: An information portal to issues affecting the health and well-being of Asian Americans in the United States
- Biological Warfare**: Biological pathogens can be intentionally deployed to cause disease or death
- Chemical Warfare**: Chemical agents can be intentionally employed to cause toxic effects on humans, animals and plants
- Children's Environmental Health Information Resources**: Children exposed to environmental hazards often have greater exposure and health problems than adults
- Dietary Supplements**: Provides links to information on dietary supplements plus vitamins and minerals, as well as herbs, botanicals and other substances. It covers research, use, databases, and law and policy

On the right side of the page, there is a search section titled 'Search TOXNET for:' with a text input field and a 'Search' button. Below the search field are radio button options: 'All TOXNET Databases', 'TOXLINE', 'HSDB', 'Haz-Map', 'ChemIDplus', and 'Household Products Database'. At the bottom of this section is a link for 'TOXNET FAQs'.

FIGURE 13.
Several Enviro-Health Links

TABLE 1

Guide to Federal Government Acronyms

ATSDR	United States Centers for Disease Control and Prevention's Agency for Toxic Substances and Disease Registry
CDC	United States Centers for Disease Control and Prevention
EPA	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
HHS	United States Department of Health and Human Services
NIH	United States National Institutes of Health
NLM	United States National Institutes of Health's National Library of Medicine
NPL	National Priorities List
SIS	United States National Library of Medicine's Division of Specialized Information Services
TEHIP	National Library of Medicine's Toxicology and Environmental Health Information Program
TOXNET	National Library of Medicine's Toxicology Data Network
TRI	United States Environmental Protection Agency's Toxics Release Inventory
USGS	United States Geological Survey

TABLE 2

Guide to NLM Environmental Health Resources

Database Name	Database Description	URL
ChemIDplus®	<p>Contains chemical nomenclature and synonyms for all chemicals and drugs listed in NLM's databases (nearly 400,000); also contains structures for over 200,000 of the chemicals and links to NLM databases and other Internet resources with information about each chemical.</p> <p>ChemIDplus Lite provides simplified Name and RN searching without the need for plugins or applets.</p> <p>ChemIDplus Advanced allows various search capabilities beyond the Lite version, including chemical structure and biological and chemical property searching.</p>	<p><http://chem.sis.nlm.nih.gov/chemidplus/chemidheavy.jsp> <http://chem.sis.nlm.nih.gov/chemidplus/chemidheavy.jsp></p>
Enviro-Health Links	<p>Web guides covering toxicology and environmental health topics of recent special interest; include links to information for both the consumer and the professional. Many contain a section on links to laws and policy affecting a topic, for example, regulations having to do with dietary supplement labeling. When possible, the guides have links to relevant books and journal articles that are available for free.</p>	< http://sis.nlm.nih.gov/enviro/envirohealthlinks.html >
Hazardous Substances Data Bank (HSDB)®	<p>Contains peer-reviewed, comprehensive toxicological data on approximately 5,000 chemicals; the information is organized into multiple categories, including human health effects, emergency medical treatment, animal toxicity studies, environmental fate and exposure, standards and regulations, chemical safety and handling, chemical and physical properties, and manufacturing and use information; excerpts from the literature are compiled from numerous sources including handbooks, textbooks, technical reports, and journal articles and are reviewed by a panel of experts.</p>	< http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB >
HazMap®	<p>Occupational health database designed for health and safety professionals and for consumers seeking information about the health effects of exposure to chemicals and biological agents at work.</p>	< http://hazmap.nlm.nih.gov/ >
IRIS	<p>Integrated Risk Information System (IRIS) contains data in support of human health risk assessment. It is compiled by the U.S. Environmental Protection Agency (EPA); contains over 500 chemical records; focuses on hazard identification and dose-response assessment; reviewed by workgroups of EPA scientists and represents EPA consensus; key data provided are EPA carcinogen classifications, unit risks, slope</p>	< http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?IRIS >

Database Name	Database Description	URL
ITER	factors, oral reference doses, and inhalation reference concentrations. Contains data in support of human health risk assessments. It is compiled by Toxicology Excellence for Risk Assessment (TERA) and contains over 600 chemical records; provides a comparison of international risk assessment information in a side-by-side format and explains differences in risk values derived by different organizations; focuses on hazard identification and dose-response assessment.	< http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?iter >
Household Products Database	Consumer guide that provides information on the potential safety and health effects of chemicals contained in more than 6,000 common household products used inside and around the home.	< http://hpd.nlm.nih.gov/ >
LactMed	Database of drugs and other chemicals to which breastfeeding mothers may be exposed. It includes information on the levels of such substances in breast milk and infant blood, and the possible adverse effects on breastfeeding and in the nursing infant.	< http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT >
MEDLINE®/PubMed®	U.S. National Library of Medicine's® (NLM) premier bibliographic database; contains approximately 17 million references to journal articles in life sciences with a concentration on biomedicine; the primary component of PubMed®, part of the Entrez series of databases provided by NLM's National Center for Biotechnology Information (NCBI).	< http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed >
TEHIP	Portal for environmental health and toxicology information; provides access to an extensive collection of databases and other Web-based resources that cover a wide range of environmental health and toxicology topics, including information on the health effects of almost 400,000 chemicals and drugs, including bibliographic databases, online toxicology handbooks, chemical and drug dictionaries, directories, "webliographies," and toxicology tutorials.	< http://tox.nlm.nih.gov >
Tox Town®	Interactive guide to commonly encountered toxic substances and their relationship to human health and the environment. Tox Town helps users explore a town, city, farm, US-Mexico border community, or port to identify potential environmental hazards; it is recommended for high school and college students, educators, and the concerned public.	< http://toxtown.nlm.nih.gov >
Toxics Release Inventory (TRI)	Data from the Environmental Protection Agency (EPA); contains the annual reports on the environmental release of over 650	< http://www.epa.gov/tri/ >

Database Name	Database Description	URL
	chemicals by industrial facilities in the United States.	
TOXLINE®	Bibliographic database containing over 3,000,000 references to the toxicological literature from MEDLINE/PubMed and many other sources, including meeting abstracts, technical reports, and research in progress.	< http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?TOXLINE >
TOXMAP®	Geographic Information System (GIS) that uses maps of the United States; helps users visually explore data from the EPA's Toxics Release Inventory (TRI) and Superfund Programs.	< http://toxmap.nlm.nih.gov >
ToxMystery®	Interactive learning site designed to help children aged 7 to 10 find clues about toxic substances that may be found in the home; contains lively animations, surprising sound effects, and lots of positive reinforcement to provide a fun, game-like experience, while teaching important lessons about potential environmental health hazards.	< http://toxmystery.nlm.nih.gov/ >
TOXNET®	Collection of databases covering toxicology, hazardous chemicals, environmental health and related areas; includes online handbooks, bibliographic references, information on the release of chemicals in the environment, and a chemical dictionary.	< http://toxnet.nlm.nih.gov/ >
WISER®	Companion piece to HSDB; designed to assist emergency responders during hazardous material incidents.	< http://wiser.nlm.nih.gov >