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Roberta Bronson Fitzpatrick and Patricia Tomasulo,
Column Editors

ITER–
International Toxicity Estimates for Risk, New TOXNET® Database

Patricia Tomasulo

ABSTRACT. ITER, the International Toxicity Estimates for Risk database, joined the TOXNET® system in the winter of 2004. ITER features international comparisons of environmental health risk assessment information and contains over 620 chemical records. ITER includes data from the EPA, Health Canada, the National Institute of Public Health and the Environment of the Netherlands, and other organizations that provide risk values that have been peer-reviewed. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2005 by The Haworth Press, Inc. All rights reserved.]*

Patricia Tomasulo (tomasulo@library.med.nyu.edu) is Coordinator of Graduate Medical Education, Ehrman Medical Library, New York University School of Medicine, 550 First Avenue, New York, NY 10016.

Comments and suggestions should be sent to the Column Editors: Roberta Bronson Fitzpatrick (fitzparb@umdnj.edu) and Patricia Tomasulo (tomasulo@library.med.nyu.edu).

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INTRODUCTION

ITER, International Toxicity Estimates for Risk <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?iter.htm>, is a toxicology database that was made available on the National Library of Medicine's Division of Specialized Information Services (SIS) TOXNET® system, the Toxicology Data Network, in January 2004. TOXNET is the amazing suite of toxicology and environmental health databases that is in turn maintained by TEHIP, the Toxicology and Environmental Health Program of SIS. TOXNET includes the well-known TOXLINE database, along with many other useful databases such as the previously reviewed ChemID*plus*®.

ITER is a free database devoted to human health risk values. This database is produced by TERA, Toxicology Excellence for Risk Assessment, a Cincinnati-based non-profit corporation organized "to protect public health by developing and communicating risk assessment values, sponsoring peer reviews and consultations, improving risk methods through research, and educating the public on risk assessment issues," as stated in the mission statement on the TERA Web site at <http://www.tera.org>. As part of TERA's outreach activities in support of public health, this group compiles and makes available peer reviewed risk value data to the international community via their ITER database. This data comes from international groups, including the U.S. Environmental Protection Agency (EPA), the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), Health Canada, the Dutch National Institute of Public Health and the Environment, the International Agency for Research on Cancer, NSF International, as well as independent parties whose risk values have undergone peer review. TERA offers the ITER database via their own Web site, but ITER will be reviewed here using the NLM TOXNET system.

SEARCHING ITER via TOXNET

As of July 1, 2004, ITER provides over 620 chemical records of substances of environmental concern. ITER may be searched by using free text such as subject terms, chemical names or name fragments, or by the CAS Chemical Abstracts Service Registry Number.

Basic Search Mode

To search for records in this database on chemicals that are hepatotoxic, for example, the term hepatotoxic can be truncated by using the asterisk symbol, and so "hepatotoxic*" is typed into the search box on the main ITER page under "Search ITER" (see Appendix, Figure 1). In this "Basic Search" mode, a list of the eight chemical records in the database is displayed that contain the truncated form of the term hepatotoxic (see Appendix, Figure 2).

Browse Search Mode

An added bonus in searching ITER is the ability to scan what is available in the database for any search term by first clicking on the "Browse the Index" button. This will take you into the "Browse" mode, and you will see the rubric "Browse ITER" in the center of the search screen. An alphabetical list of the search terms used, along with the number of records available in the database for each term, will display. "Up" and "Down" buttons show other terms that are alphabetically above or below the original search term when either button is clicked on (see Appendix, Figure 3). To return to the basic search mode, click on "Return to Basic Search."

Synonym Searching

When searching for chemicals, the TOXNET system default is to expand the search by adding synonyms and also the CAS Registry Numbers. This feature may be switched off, if so desired, by checking the radio button "NO" found in the central search box directly under the description, "For chemicals, add synonyms and CAS numbers to search." So that means, for example, a search for the simple chemical name "toluene" results in four different records. The first record is for toluene along with its CAS RN, plus three other records that contain one or more of the requested chemical names in a list that appears like this:

1. **TOLUENE** 108-88-3
2. **TOLUENE DIISOCYANATE** 26471-62-5
3. **DIMETHYLFORMAMIDE, N,N-** 68-12-2
4. **XYLENES** 1330-20-7

Limits Features

ITER allows for Boolean searching using the operators AND, OR, NOT. ITER, as do most TOXNET databases, includes a LIMITS button on the main

search screen. The choice of adding synonyms and CAS numbers is also available here, along with the ability to specify the fields to be searched, and to specify the precision of the search, for example, by exact words, word variants, etc. (see Appendix, Figure 4).

The unique limit in ITER is to specify the particular type of risk data to focus the search on: Noncancer Oral, Cancer Oral, Noncancer Inhalation, and/or Cancer Inhalation. The default is to include all fields if no box is checked off.

Multi-File Searching

A single search query may be run against these four other TOXNET databases, at the same time as searching ITER:

1. Hazardous Substances Data Bank (HSDB)
2. Integrated Risk Information System (IRIS)
3. Chemical Carcinogenesis Research Information (CCRIS)
4. Genetic Toxicology (GENE-TOX)

Click on the button "Multi-Databases" under the Databases list on the left-hand side column of the ITER main search page to initiate a simultaneous database search of all five databases. Another option is to check off only those databases out of these five that you want to search (see Appendix, Figure 5).

Of course, the option is also always available to simultaneously search all of the TOXNET databases by clicking on the TOXNET button under that left-hand Databases column. However, *the Multi-Databases search function available in ITER* allows for the grouping of more similar types of hazardous substance factual data, risk data, and test results, and does not include bibliographic citations as does TOXLINE.

The search results first display what is called the "primary record" when the query is for a chemical. This is the main chemical record with substance identification information and risk data in ITER. The records, which come after this primary record, contain the search term somewhere in the record and are ranked according to relevancy (see Appendix, Figure 6). This relevancy ranking is based on the number of times the search term is found in the record, the rarity of the term in the database, and the adjacency of the search terms.

ITER CONTENT

ITER is composed of more than 620 chemical records with information on toxic risk levels and risk values, carcinogen classifications, and dose-related information. The ITER database presents a comparison of the international

risk assessment data via summary tables with the information from each parent organization listed next to each other. The data is broken down into four groups of risk type:

1. Noncancer Oral
2. Cancer Oral
3. Noncancer Inhalation
4. Cancer Inhalation

There are separate tables for each of these risk factors, and the full ITER record opens with a summary table of the data that is available for a given chemical (see Appendix, Figure 7).

There is a green check when data is available from one of the listed organizations, and links are provided to each organization's Web home page. A well-written synopsis summarizing the results for each of the four types of risk data appears after each table. There are links to additional data, for example, such as the details on a chemical's assessment from the EPA, with a direct link to that information in TOXNET's IRIS database.

CONCLUSION

The National Library of Medicine has again made scientific information of major importance freely available to the public on the Internet. This time, NLM has added a previously available database, ITER, which is produced by the private TERA organization, to the comprehensive TOXNET system of toxicology and environmental health databases. NLM has fully integrated ITER into TOXNET, included ITER in TOXNET's multi-file database searching, and greatly enhanced ITER's original search capabilities.

CONTACT INFORMATION

ITER Representative
Specialized Information Services
National Library of Medicine
Two Democracy Plaza, Suite 510
6707 Democracy Boulevard, MSC 5467
Bethesda, MD 20892-5467
FAX: (301) 480-3537
Telephone: (301) 496-1131
e-mail: tehip@teh.nlm.nih.gov

APPENDIX

FIGURE 1. Search for Records Concerning Hepatotoxicity by Using the Truncation Symbol and Entering "Hepatotoxic*"
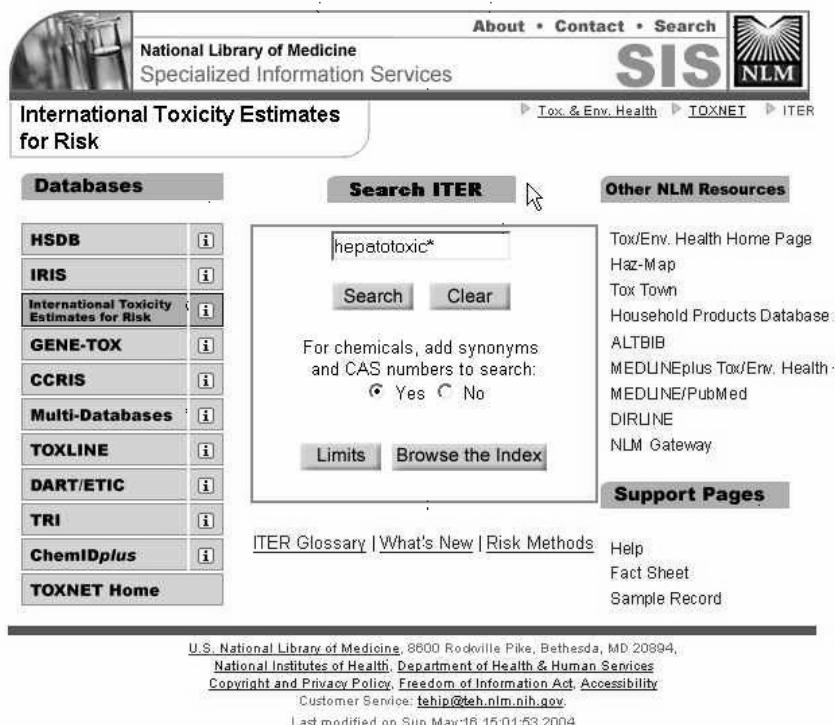
FIGURE 2. ITER Search Results for "Hepatotoxic*"

APPENDIX (continued)

FIGURE 3. Browse ITER for Textword "Hepatoxic"

FIGURE 4. Options in ITER Limits Feature

APPENDIX (continued)

FIGURE 5. Search for Multi-Databases for "Malathion" with Option to Check Off Up to Five TOXNET® Databases

FIGURE 6. Search Results in Multi-Databases Option for "Malathion"

APPENDIX (continued)

FIGURE 7. Summary Table for Risk Data on Chemical "Malathion"