

FIFTH EDITION



# Information Resources in Toxicology

Edited by

PHILIP WEXLER

Steven G. Gilbert | Asish Mohapatra

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VOLUME TWO:  
THE GLOBAL ARENA



# INFORMATION RESOURCES IN TOXICOLOGY

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FIFTH EDITION

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# INFORMATION RESOURCES IN TOXICOLOGY

Volume 2: The Global Arena

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FIFTH EDITION

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# DEDICATIONS, WITH LOVE

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## **Philip Wexler**

To my wife, Nancy; mom, Yetty; dad, Will (in memory of); son, Jake; and spaniel mix, Gigi

## **Steven G. Gilbert**

To knowledge, may it lead to truth.

## **Asish Mohapatra**

To my wife Sarah, daughter Maya, my Mom (Kanak), and Dad (Mahendra)

## **Sol Bobst**

I dedicate this edition to Jessica Culley, for her love and support of my projects and business, and for being gracious with me and my idiosyncrasies.

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To my husband and fellow scientist Martin, my son Tauer, and my daughter Gigi

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As Well As

To the many casualties of the 2020 global COVID-19 pandemic and the brave, caring, and generous people helping us get through it and return to normalcy.

and

With appreciation to the scientists and other good people working to reverse the ravages of pollution and global climate change and take us to a habitable, clean, healthy, and sustainable environment.

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## Turkey

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### History of toxicology in Turkey

The history of Turkish medicine in Anatolia (also known as Asia Minor) dates back to the beginning of 11th century. Two well-known Turkish states in history, Seljuk and the Ottoman Empires, were founded in Anatolia, in 1071 and 1299, respectively. The Anatolian Seljuk ruler Alaeddin Keykubad invited physicians from Turkistan, Khwarazm, Khorasan, and Azerbaijan (areas densely populated by Turkish people) to his domain. Also, there was an inevitable exchange of medical cultures between people who settled in Anatolia before the arrival of the Turks, both before and after their conversion to Islam. During the Ottoman Empire, the first examples of medical education were described in 1470 when a Dar al Şifa (historical name for hospital) was built in the Fatih Complex (Külliyesi) in Istanbul. This hospital formed the origins of the first school of medicine. The second institution was the Süleymaniye Dar al Şifa and Medicine Madrasa (historical name for school), which came into service in 1557 named as Süleymaniye Complex. Until the 17th century, Ottoman medicine was based upon an Islamic foundation. Although Ottoman medical science began to turn its face to modern Western medicine in the 17th century, it should still be regarded mainly as the continuation of Islamic medicine until the 19th century ([Istanbul University Faculty of Pharmacy, 2018](#)).

In 1806 the Tabiphane Military Medical School based in Spitalia Hospital was founded for training modern physicians and surgeons. The Western influence on Turkish medical education, via the French medical establishment was apparent in “Mekteb-i Tibbiye-yi Şahane.” After the establishment of “Mülki

Tibbiye”—a civilian School of Medicine, native Turkish started to be used as the language of instruction. In 1909 the military and civilian schools of medicine were united as the Haydarpaşa School of Medicine. After the collapse of the Ottoman Empire, Mustafa Kemal Atatürk founded the modern Republic of Turkey in 1923. According to Atatürk’s vision and directives, the first modern school of medicine, “The Istanbul School of Medicine,” was established in 1933. A limited number of other medical schools were founded at the same time. While the number of medical faculties was 7 in 1970, this number reached to 60 in 2007 ([Kurdak et al., 2008](#)). Currently, there are more than 90 medical schools in Turkey, which provide undergraduate medical education.

Pharmacy education in Turkey began when the “Pharmacist Class” opened under Mekteb-i Tibbiye-i Adliye-i Şahane (Military Medical School) founded by Sultan Mahmud-II on May 14, 1839. The curriculum was taught in French until 1870. On March 1, 1867, Mekteb-i Tibbiye-i Mülkiye-i Şahane (Civil Medical School) was established in a section of the Military Medicine building. There was also a Pharmacist Class in this school. This school was then moved to Menemenli Mustafa Pasha Mansion in Kadirga. After the founding of İstanbul Darülfünun in 1908, the Pharmacist Class was converted into “Eczacı Mekteb-i Alisi” (school of pharmacy) and unified with “Dişçi Mekteb-i Alisi” (school of dentistry) at the same year and named “Darülfünun-i Osmani Eczacı ve Dişçi Mekteb-i Alisi.” In 1933 the University Reform was realized. On the grounds that the curriculum of the Pharmacy School is closer to the life sciences than medicine, the school was separated from the School of Medicine and connected to the School of Science.

In 1944 the school was reattached to the School of Medicine. In order to make pharmacy teaching better and to be successful in the profession, the Pharmacy School students and academic staff, who believed that the teaching of the pharmacy should be made independent of the School of Medicine, attempted to establish an independent school of pharmacy. These initiatives were finally realized in 1961. It was unanimously agreed at a meeting of the Professors' Board of the School of Medicine on February 4, 1961 that pharmacy education should be taught at an independent school of pharmacy. The decision was accepted at the Istanbul University Senate on November 16, 1961 and was officially recognized in January 15, 1962 with the approval of the Minister of Education (Sari, 2001).

In today's Turkey, independent toxicology departments are mainly located under the schools of pharmacy. Some schools of medicine and schools of veterinary medicine also have toxicology units within their pharmacology departments. All toxicology departments in schools of pharmacy have undergraduate toxicology courses with laboratory practices. The first undergraduate toxicology course labeled "analytical toxicology" was offered by the Istanbul University, School of Pharmacy in 1914. A graduate toxicology program in toxicology has been offered since the 1950s and today more than 20 universities have MSc and PhD programs in toxicology.

The Turkish Society of Toxicology (TST) is the primary professional organization for all toxicology related science in Turkey. TST was established as a nonprofit organization on October 1, 1987 by 14 founding members with the aim of disseminating toxicological knowledge for improving health and safety by raising standards of living. The vision of the TST is maintaining the contemporary level of toxicological research and applications in the country, while enhancing the Society's efficiency at the international level. The TST is the pioneer association to institutionalize toxicology in the country by contributing to the protection of public health and environmental quality. The main objectives of TST are to increase the effectiveness of toxicology knowledge in Turkey, improve communication between toxicologists by encouraging exchange of information among researchers, make contact with international organizations in the field of toxicology, support education in toxicology by motivating general and/or individual toxicological studies, and organize congresses, symposia, and other meetings for sharing ideas on various topics in the field of toxicology. TST became a member of the Federation of European Toxicologists and European Societies of Toxicology (EUROTOX) in 1989 and the International Union of Toxicology (IUTOX) in 1998. TST is also the national registry authority for the European Registered

Toxicologist (<http://www.eurotox.com/ert/>) among 21 other European toxicology societies. There are currently 36 Turkish toxicologists accredited by TST since 2005. The symbol of the society was created by using the initial letters of the TST with a rising arrow, which represents the developing national toxicology field in accordance with the mission of the society. Twelve ordinary general meetings have been arranged and boards have been elected since the establishment of TST (Turkish Society of Toxicology, 2018).

Along with organizing several symposia, panels and national congresses, TST has also organized international congresses such as: 4th Congress of Toxicology of Developing Countries (4th CTOX-DC) November 6–10, 1999/Antalya; 39th Congress of the European Societies of Toxicology (EUROTOX 2001) September 12–15, 2001/Istanbul; 5th International Congress of the Turkish Society of Toxicology (5th IC-TST) October 30–November 2, 2003/Antalya; 6th International Congress of the Turkish Society of Toxicology (6th IC-TST) November 2–5, 2006/Antalya; 7th National Congress of the Turkish Society of Toxicology with international participation (7th IC-TST) May 30–June 1, 2009/Ankara; 8th National Congress of the Turkish Society of Toxicology with international participation (8th IC-TST) November 14–18, 2012/Antalya; 9th Congress of the Turkish Society of Toxicology with the Participation of the Hellenic Society of Toxicology (TURKHELTOX 2015) October 21–24, 2015/Ceşme & Chios (Greece); 7th International Nanotoxicology Congress (NanoTox 2014) April 23–26, 2015/Antalya; and recently, 52th Congress of the European Societies of Toxicology (EUROTOX 2016) September 4–7, 2016, relocated from Istanbul to Seville (Spain) 6 months ahead of the congress due to the actual conditions.

Among the members of TST from universities to industry, some of the distinguished members who have served and still serve in key positions in executive committees of IUTOX and EUROTOX include president of IUTOX (Prof.Dr. Ali Esat Karakaya), president of EUROTOX (Prof.Dr. Mumtaz Iscan), vice-president of IUTOX (Prof.Dr. Nursen Basaran) and Executive Committee member of EUROTOX (Prof.Dr. Nursen Basaran, Prof.Dr. Hilmi Orhan).

## References

- Istanbul University Faculty of Pharmacy, <<http://eczacilik.istanbul.edu.tr/tr/content/fakultemiz/tarihce>> (accessed 11.11.2018).
- Kurdak, H., Altintas, D., Doran, F., 2008. Medical education in Turkey: past to future. *Med. Teach.* 30, 768–773.
- Sari, N., 2001. Turkey and its international relations in the history of medicine. *Vesalius VII* (2), 86–93.
- Turkish Society of Toxicology, <[www.turkttox.org.tr/](http://www.turkttox.org.tr/)> (accessed 11.11.2018).

## Resources

### Books in Turkish

Some books in Turkish are listed below:

Agop Çıtak, Levent Yılmaz (2011)

*Pediatric Poisoning (Turkish)*

Publisher: Istanbul Medikal

ISBN: 9789944211987

İsmet Dökmeci (1994)

*Toxicology: Diagnosis and Treatment in Poisoning (Turkish)*

Publisher: Nobel Tıp

ISBN: 9754200742

Ali Esat Karakaya (2018)

*From Chemical to Food: Dose and Risk (Turkish)*

Publisher: Artek

ISBN: 6052450833

Sezai Kaya, İbrahim Pirinççi, Ali Bilgili (1998)

*Toxicology in Veterinary Medicine (Turkish)*

Publisher: Medisan Publishing House

ISBN: 9757774634

Oguz Kayaalp (2013)

*Principles of Clinical Pharmacology and Basic Regulations (Turkish), 5th Edition*

Publisher: Pelikan Publishing House

ISBN: 9786055270360

Oguz Kayaalp (2018)

*Medical Pharmacology for Rational Therapy (Turkish), 13th Edition*

Publisher: Pelikan Publishing House

ISBN: 9786055270100

Salim Satar (2009)

*Clinical Toxicology in ER (Turkish)*

Publisher: Akademisyen

ISBN: 9786053970279

Nevin Vural (1984)

*Toxicology (Turkish)*

Publisher: Ankara University Publications

ISBN: 9754822891

### International publications by Turkish editors

Some international publications by Turkish editors are listed below:

Diana Anderson, Ali Esat Karakaya, Radim J. Srám (2000)

*Human Monitoring after Environmental and Occupational Exposure to Chemical and Physical Agents (NATO Asi Series: Series A: Life Sciences) (English)*

Publisher: Ios Pr Inc.

ISBN: 9051994958/9789051994957

Miral Dizdaroglu, Ali Esat Karakaya (1999)

*Advances in DNA Damage and Repair: Oxygen Radical Effects, Cellular Protection, and Biological Consequences (Nato Science Series A) (English)*

Publisher: Springer

ISBN: 1461372070/9781461372073

P. Erkekoglu, B.K. Gumusel (2017)

*Bisphenol A Exposure and Health Risks (English)*

Publisher: InTechOpen

ISBN: 9535132172/9789535132172

Atila Engin, Ayse Basak Engin (2015)

*Tryptophan Metabolism: Implications for Biological Processes, Health and Disease (Molecular and Integrative Toxicology) (English)*

Publisher: Humana Press

ISBN: 3319156292/9783319156293

P. Erkekoglu, T. Baydar (2013)

*Nitrite Chemistry and Toxicity (English)*

Publisher: LAP LAMBERT Academic Publishing

ISBN: 3659357537/9783659357534

### Translation books

Some books translated to Turkish are listed below:

Nurşen Başaran, Terken Baydar, Ülkü Ündeğer

Bucurgat, Belma Koçer Giray, Aylin Gürbay, Hilal Özgüneş, Gönül Şahin (2013)

*Pharmaceutical Toxicology (Editor: Gerard J. Mulder, Lennart Dencker)*

Publisher: Nobel Tıp Kitabevleri

ISBN: 9789754209679

Salim Satar (2008)

*Goldfrank's Manual of Toxicologic Emergencies*

Publisher: Nobel Kitabevi

ISBN: 978076053970095

Vahide Savci (2012)

*Poisoning and Drug Overdose (Editor: Kent R. Olson)*

Publisher: Nobel Tıp Kitabevleri

ISBN: 9789754209075

Sinan Süzen, Pinar Erkekoğlu, Ahmet Oğuz Ada, Onur Erdem, Gonca Çakmak Demircigil, Bulut Demirel (2017)

*Casarett and Doull's: Essentials of Toxicology*

ISBN: 9786059215183

Turan Turhan, Aslı Pınar, Tuncay Küme (2018)

*Resolving Erroneous Reports in Toxicology and Therapeutic Drug Monitoring: A Comprehensive Guide*

ISBN: 9786053559627

## Journals

There are no journals devoted solely to toxicology in Turkey. Nevertheless, toxicology related articles can be found in the journals listed below:

*The Anatolian Journal of Cardiology*  
ISSN: 2149-2263

The Anatolian Journal of Cardiology aims to publish qualified and original clinical, experimental, and basic research on cardiology at the international level. The journal's scope also covers editorial comments, reviews of innovations in medical education and practice, case reports, original images, scientific letters, educational articles, letters to the editor, articles on publication ethics, diagnostic puzzles, and issues in social cardiology.

Web: <http://www.anakarder.com/> (English)

*The Balkan Medical Journal*  
ISSN: 2146-3123

The Balkan Medical Journal (Balkan Med J) is a peer-reviewed open-access international journal that publishes clinical and experimental research conducted in all fields of medicine, case reports and clinical images, invited reviews, editorials, letters, comments, and letters to the editor including reports on publication and research ethics.

Web: <http://balkanmedicaljournal.org/static.php?id=9> (English)

*Clinical and Experimental Health Sciences (Formerly published as Journal of Marmara University Institute of Health Sciences)*  
ISSN: 2459-1459

The aim of the journal is to contribute to the literature by publishing clinical and experimental research articles, case reports, letters to the editor, and editorial comments prepared in accordance with the ethical guidelines in all disciplines of health sciences. The target audience includes specialists and medical professionals working in all disciplines of the health sciences.

Web: <http://www.clinexphhealthsci.com/eng/Anasayfa> (English)

Web: <http://www.clinexphhealthsci.com/tr/Anasayfa> (Turkish)

*Food and Health*  
ISSN: 2602-2834

"Food and Health" publishes peer-reviewed (double blind) articles covering all aspects of food science and health effects of food, in the form of original research articles (full papers and short communications), and review articles. Their team of experts provides editorial excellence, fast publication processes,

and high visibility for papers. Food/seafood/food technology/food chemistry/food microbiology/food quality/food safety/food contaminant/food allergen/food packaging/modified food/functional food/dietary supplements/nutrition, and their health effects are the general topics of the journal.

Web: <http://jfhs.scientificwebjournals.com/> (English)

*Journal of Research in Pharmacy (Formerly Published as Marmara Pharmaceutical Journal)*  
ISSN: 2630-6344

This journal is the continuation of the former "Journal of Pharmacy of University of Marmara" which was published between 1985 and 1997. It is an open access, peer-reviewed journal devoted to the publication of papers in pharmacy and pharmaceutical sciences. The articles may be either in English or in Turkish. The journal welcomes articles in this multidisciplinary field, with a focus on topics relevant for drug action, drug discovery and development, conventional and emerging fields related to pharmaceutical sciences

Web: <http://www.jrespharm.com/> (English)

*Northern Clinics of Istanbul/Istanbul Kuzey Klinikleri*  
ISSN: 2148-4902

Northern Clinics of Istanbul was designed so as to accept scientific papers in all fields of medicine which comply with its concept. Essentially, the aim is to publish original experimental, and clinical articles written in Turkish, and English, however it also publishes review articles, case reports, and letters to the editor.

Web: <http://kuzeyklinikleri.com/?p=About-Journal> (English)

Web: <http://kuzeyklinikleri.com/tr/jvi.aspx> (Turkish)

*Turkish Journal of Biochemistry*  
ISSN (Online) 1303-829X,

Original manuscripts (research articles, reviews, technical reports, case presentations, commentaries) not published elsewhere, on biochemistry, chemical pathology, molecular biology, molecular genetics, biotechnology, bioinformatics, bioengineering, and disciplinary education are to be published in the journal.

Web: <http://www.turkjbiochem.com/eng/> (English)

Web: <http://www.turkjbiochem.com/tur/index.html> (Turkish)

*Turkish Journal of Biology*  
ISSN:1300-0152

The Turkish Journal of Biology is published electronically six times a year by the Scientific and Technological Research Council of Turkey (TÜBİTAK) and accepts English-language manuscripts concerning biological processes including biochemistry and

biosynthesis, physiology and metabolism, molecular genetics, molecular biology, genomics, proteomics, molecular farming, biotechnology/genetic transformation, nanobiotechnology, bioinformatics and systems biology, cell and developmental biology, stem cell biology, and reproductive biology.

Web: <http://journals.tubitak.gov.tr/biology/index.htm?jsessionid=5F62E160E1EE39977F2ACBBB874BDDD9> (English)

*The Turkish Journal of Hematology*  
ISSN: 1300-7777

The aim of The Turkish Journal of Hematology is to publish original hematological research of the highest scientific quality and clinical relevance. Additionally, educational material, reviews on basic developments, editorial short notes, images in hematology, and letters from hematology specialists and clinicians covering their experience, and comments on hematology and related medical fields as well as social subjects are published.

Web: <http://www.tjh.com.tr/> (English)

*Turkish Journal of Medical Sciences*  
ISSN: 1300-0144

The Turkish Journal of Medical Sciences is published electronically six times a year by the Scientific and Technological Research Council of Turkey (TÜBİTAK) and accepts English-language manuscripts in all fields of medicine and related health sciences. Contribution is open to researchers of all nationalities. The following types of papers are welcome: original articles (for the presentation of clinical and laboratory studies), review articles (by invitation only), and letters to the editor.

Web: <http://journals.tubitak.gov.tr/medical/index.htm> (English)

*The Turkish Journal of Pediatrics*  
ISSN: 0041-4301

The Turkish Journal of Pediatrics is a multidisciplinary, peer-reviewed, open access journal that seeks to publish research to advance the field of Pediatrics. The Journal publishes original articles, case reports, review of the literature, short communications, clinicopathological exercises, and letters to the editor in the field of pediatrics.

Web: <http://www.turkishjournalpediatrics.org/> (English)

*Turkish Journal of Pharmaceutical Sciences*  
ISSN:1304-530X

The aim of the Turkish Journal of Pharmaceutical Sciences is to publish original research papers of the

highest scientific and clinical value at an international level. The target audience includes specialists and physicians in all fields of pharmaceutical sciences.

Web: <http://www.turkjps.org/> (English)

## Organizations

*Republic of Turkey, Ministry of Health*  
Address: T.C. Sağlık Bakanlığı, Üniversiteler Mah. Dumlupınar Bulv. 6001. Cad. No:9, 06800 Bilkent—Çankaya/ANKARA—TÜRKİYE  
Email: [disabgm@saglik.gov.tr](mailto:disabgm@saglik.gov.tr)  
Phone: +90 (312) 585 10 00  
Web: [https://www.saglik.gov.tr/?\\_Dil=2](https://www.saglik.gov.tr/?_Dil=2) (English)  
Web: [https://www.saglik.gov.tr/?\\_Dil=1](https://www.saglik.gov.tr/?_Dil=1) (Turkish)

*Republic of Turkey Ministry of Food, Agriculture, and Livestock*  
Address: Üniversiteler Mah. Dumlupınar Bulvarı, No: 161, 06800, Çankaya/ANKARA—TÜRKİYE  
Email: [gthb.genelevrak@gthb.hs01.kep.tr](mailto:gthb.genelevrak@gthb.hs01.kep.tr)  
Phone: +90 312 287 3360 (PBX)  
Web: <https://www.tarim.gov.tr/Sayfalar/EN/AnaSayfa.aspx> (English)  
Web: <https://www.tarim.gov.tr/Sayfalar/AnaSayfa.aspx> (Turkish)

*Presidency of Institute Of Research and Development of Occupational Health and Safety*  
Address: Batı Sitesi Mah. Fatih Sultan Mehmet Bulvarı No: 464 (İstanbul Yolu 14. Km) 06370 Yenimahalle/ANKARA—TÜRKİYE  
Phone: +90 (312) 257 16 37 - 0 312 257 16 38  
Fax: +90 (312) 257 16 11  
Web: <https://www.csgb.gov.tr/isgum-en> (English)  
Web: <https://www.csgb.gov.tr/isgum> (Turkish)

*The Scientific and Technological Research Council of Turkey (TUBITAK)*  
Address: TÜBİTAK Başkanlık Tunus Caddesi No:80, 06100 Kavaklıdere/ANKARA—TÜRKİYE  
Phone: +90 (312) 468 53 00  
Web: <https://www.tubitak.gov.tr/en> (English)  
Web: <https://www.tubitak.gov.tr/> (Turkish)

*Council of Higher Education*  
Address: Yükseköğretim Kurulu Başkanlığı, Üniversiteler Mah. 1600. Cad. No:10 06800 Bilkent/ANKARA, TÜRKİYE  
Email: [cohe@yok.gov.tr](mailto:cohe@yok.gov.tr)  
Phone: + 90 (312) 298 70 00  
Web: <http://www.yok.gov.tr/en/web/cohe/homepage> (English)  
Web: <http://www.yok.gov.tr/tr/> (Turkish)

## Universities

Undergraduate toxicology education in Turkey takes place at schools of pharmacy with a 48 hour course and laboratory work for one semester. In schools of medicine and veterinary medicine, a toxicology course is given as a chapter of pharmacology, and in faculties such as biology, chemistry, food engineering, and environmental engineering elective toxicology courses are offered. In schools of pharmacy, graduate programs in toxicology have been offered by departments of toxicology/pharmaceutical toxicology. In schools of veterinary medicine, graduate programs on veterinary toxicology have been offered by departments of veterinary pharmacology and toxicology. In some of the schools of medicine, the department of pharmacology has been offering MS and PhD programs on toxicology.

Some of the universities that offer graduate degrees on toxicology are listed below.

*Hacettepe University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Hacettepe University, Faculty of Pharmacy, 90-06100 Sıhhiye, ANKARA, TÜRKİYE

Email: [eczdekan@hacettepe.edu.tr](mailto:eczdekan@hacettepe.edu.tr)

Phone: +90 (312) 305 10 88

Fax: +90 (312) 311 47 77

Web: <http://www.eczacilik.hacettepe.edu.tr/en> (English)

Web: [http://www.eczacilik.hacettepe.edu.tr/tr/farmasotik\\_toksikoloji\\_anabilim\\_dali-13](http://www.eczacilik.hacettepe.edu.tr/tr/farmasotik_toksikoloji_anabilim_dali-13) (Turkish)

*Ankara University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Ankara Üniversitesi Eczacılık Fakültesi  
Emniyet Mah. Degol Cd. No:4 Posta Kod:06560  
Yenimahalle, ANKARA, TÜRKİYE

Phone: +90 312 203 30 00

Fax: +90 312 213 10 81

Email: [eczacilik@ankara.edu.tr](mailto:eczacilik@ankara.edu.tr)

Web: <http://toksikol.pharmacy.ankara.edu.tr/en/> (English)

Web: <http://toksikol.pharmacy.ankara.edu.tr/> (Turkish)

*Gazi University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Gazi Üniversitesi, Eczacılık Fakültesi, 06330,  
Hipodrom, Etiler ANKARA, TÜRKİYE

Email: [iorhan@gazi.edu.tr](mailto:iorhan@gazi.edu.tr)

Phone: +90 (312) 212 68 40 - 202 20 00

Fax: +90 (312) 221 32 02

Web: [http://pharmacy.gazi.edu.tr/?language=en\\_US](http://pharmacy.gazi.edu.tr/?language=en_US) (English)

Web: <http://pharmacy.gazi.edu.tr/posts/view/title/Farmas%C3%B6tik-Toksikoloji-77362> (Turkish)

*Istanbul University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: İstanbul Üniversitesi, Eczacılık Fakültesi,  
34116, Beyazıt İSTANBUL, TÜRKİYE

Email: [ecza\\_dekan@istanbul.edu.tr](mailto:ecza_dekan@istanbul.edu.tr)

Phone: + 90 (212) 440 00 00

Fax: + 90 (212) 440 02 52

Web: <http://eczacilik.istanbul.edu.tr/en/> (English)

Web: <http://eczacilik.istanbul.edu.tr/tr/akademikkadro> (Turkish)

*Marmara University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Marmara Üniversitesi Eczacılık Fakültesi,  
Tıbbiye Cad. No: 49 Haydarpaşa 34668 İSTANBUL,  
TÜRKİYE

Email: [pharmacy@marmara.edu.tr](mailto:pharmacy@marmara.edu.tr)

Phone: +90 (216) 414 29 62-63-65

Fax: +90 (216) 345 29 52

Web: <https://eczacilik.marmara.edu.tr/en/departments/professional-pharmaceutical-sci/department-of-pharmaceutical-toxicology/> (English)

Web: <https://eczacilik.marmara.edu.tr/bolumler/eczacilik-meslek-bilimleri/farmasotik-toksikoloji-anabilim-dali/> (Turkish)

*Ege University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Erzene Mahallesi, Eczacılık Fakültesi Binası,  
35040 Bornova/İZMİR, TÜRKİYE

Email: [ecz.dekanlik@mail.ege.edu.tr](mailto:ecz.dekanlik@mail.ege.edu.tr)

Phone: +90 (232) 388 22 41

Fax: +90 (232) 388 52 58

Web: <http://pharm.ege.edu.tr/index.php/department-of-pharmaceutical-toxicology/> (English)

Web: <http://eczacilik.ege.edu.tr/index.php/akademik-birimler/eczacilik-meslek-bilimleri/farmasotik-toksikoloji-anabilim-dali/> (Turkish)

*Anadolu University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: Anadolu Üniversitesi, Eczacılık Fakültesi,  
Yunus Emre Kampüsü, Tepebaşı/ESKİŞEHİR,  
TÜRKİYE

Email: [eczfak@anadolu.edu.tr](mailto:eczfak@anadolu.edu.tr)

Phone: +90 (222) 335 07 50

Web: <https://www.anadolu.edu.tr/en/academics/faculties/135/faculty-of-pharmacy/general-info> (English)

Web: <http://eczacilik.anadolu.edu.tr/2017/#abdbolum> (Turkish)

*Yeditepe University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology*

Address: İnönü Mahallesi, Kayışdağı Caddesi, 26  
Ağustos Yerleşimi, Atasehir, 34755, İSTANBUL,  
TÜRKİYE

Email: [info@yeditepe.edu.tr](mailto:info@yeditepe.edu.tr)

Phone: +90 (216) 578 00 00

Fax: +90 (216) 578 02 99

Web: <http://eczacilik.yeditepe.edu.tr/en/dersler/pharmaceutical-toxicology-lab> (English)

Web: <http://eczacilik.yeditepe.edu.tr/tr/dersler/farmasotik-toksikoloji> (Turkish)

*Dokuz Eylül University, Faculty of Medicine, Department of Medical Pharmacology, Clinical Toxicology Unit*  
Address: Dokuz Eylül Üniversitesi Sağlık Yerleşkesi / İnciraltı 35340 İZMİR—TÜRKİYE

Email: [tip@deu.edu.tr](mailto:tip@deu.edu.tr)

Phone: +90 (232) 4122222

Fax: -

Web: <http://tip.deu.edu.tr/en/#> (English)

Web: <http://tip.deu.edu.tr/tr/tibbi-farmakoloji-anabilim-dali/> (Turkish)

*Trakya University, Faculty of Medicine, Department of Pharmacology*

Address: Trakya Üniversitesi Tıp Fakültesi Dekanlığı  
Balkan Yerleşkesi 22030 EDİRNE—TÜRKİYE

Email: [dekanlik@trakya.edu.tr](mailto:dekanlik@trakya.edu.tr)

Phone: +90 (284) 235 76 53

Fax: +90 (284) 235 76 52

Web: <https://tipfak-en.trakya.edu.tr/akademik-yapi/kadro/a/> (English)

Web: <https://tip.trakya.edu.tr/akademik-yapi/tibbi-farmakoloji-anabilim-dali/ogretim-elemanlari/> (Turkish)

*Ankara University, Faculty of Veterinary Medicine, Department of Pharmacology and Toxicology*

Address: Ankara Üniversitesi Veteriner Fakültesi,  
06110 Dışkapı, ANKARA—TÜRKİYE

Email: [vetmed@veterinary.ankara.edu.tr](mailto:vetmed@veterinary.ankara.edu.tr)

Phone: +90 (312) 317 03 15

Fax: +90 (312) 316 44 72

Web: <http://www.veterinary.ankara.edu.tr/en/department-of-pharmacology-and-toxicology/> (English)

Web: <http://www.veterinary.ankara.edu.tr/farmakoloji-ve-toksikoloji-anabilim-dali/> (Turkish)

*Istanbul University, Faculty of Veterinary Medicine, Department of Pharmacology and Toxicology*

Address: İstanbul Üniversitesi-Cerrahpaşa Veteriner Fakültesi Avcılar Yerleşkesi 34320 Avcılar, İSTANBUL, TÜRKİYE

Email: [ivfdek@istanbul.edu.tr](mailto:ivfdek@istanbul.edu.tr)

Phone: +90 (212) 473 70 70

Fax: +90 (212) 473 72 41

Web: <http://veteriner.istanbul.edu.tr/en/content/division-of-preclinical-sciences/department-of-pharmacology-&-toxicology> (English)

Web: <http://veteriner.istanbul.edu.tr/tr/content/klinik-oncesi-bilimler-bolumu/farmakoloji-ve-toksikoloji-anabilim-dali> (Turkish)

*Ankara University, Faculty of Veterinary Medicine, Department of Pharmacology and Toxicology*

Address: Bursa Uludağ Üniversitesi Veteriner Fakültesi 16059 Görükle Kampüsü, BURSA—TÜRKİYE

Email: [vetdek@uludag.edu.tr](mailto:vetdek@uludag.edu.tr)

Phone: +90 (224) 294 12 07

Fax: +90 (224) 294 12 02

Web: <http://www.uludag.edu.tr/veteriner/default/konu/2932> (Turkish)

## Professional societies

*Turkish Society of Toxicology*

Address: Anadolu Üniversitesi Eczacılık Fakültesi  
Farmasötik Toksikoloji Anabilim Dalı, 26470  
Eskişehir, TÜRKİYE

Email: [nbasaran@hacettepe.edu.tr](mailto:nbasaran@hacettepe.edu.tr)

Phone: +90 (222) 335 05 80

Fax: +90 (222) 335 07 50

Web: <http://www.turktox.org.tr/> (English)

Web: <http://www.turktox.org.tr/> (Turkish)

*Turkish Society of Clinical Toxicology*

Address: Klinik Toksikoloji Derneği, Eski Kaplıca Sokak, Kaplıca Apartmanı 2/17 Bursa, TÜRKİYE

Email: [kliniktoksikolojidernegi@gmail.com](mailto:kliniktoksikolojidernegi@gmail.com)

Web: <http://kliniktoksikolojidernegi.org/> (Turkish)

*Veterinary Pharmacology and Toxicology Association*

Address: Atmaca Sokak No.8/3 Dışkapı, Ankara, TÜRKİYE

Email: [vetfarmatoks@gmail.com](mailto:vetfarmatoks@gmail.com), [vftd@vetfarmatoks.org.tr](mailto:vftd@vetfarmatoks.org.tr)

Web: <http://www.vetfarmatoks.org.tr/index.php>

(Turkish)

*Society of Forensic & Clinical Toxicology (SOFOCT)*

Address: Çukurova Üniversitesi Tıp Fakültesi Adli Tıp Anabilim Dalı 01330 Balcalı, Adana—TÜRKİYE

Email: [info@aktod.org](mailto:info@aktod.org)

Phone: +90 (322) 338 60 60 / Dahili: 3428-3429

Fax: +90 (322) 338 60 60

Web: <http://www.aktod.org/english/> (English)

Web: <http://www.aktod.org/> (Turkish)

*Turkish Society of Pharmacology*

Address: Karadeniz Teknik Üniversitesi Tıp Fakültesi,  
Tıbbi Farmakoloji Ab.D. 61187 Trabzon, TÜRKİYE

Email: [ersinyaris@gmail.com](mailto:ersinyaris@gmail.com)

Phone: +90 (462) 377 78 37

Fax: +90 (462) 377 78 37

Web: <http://www.tfd.org.tr/> (Turkish)

*Turkish Chemical Manufacturers Association*

Address: Değirmen Sokak Şaşmaz Sitesi No:19 Duran Bey Apt. Kat:3 D:9 34742 Kozyatağı Kadıköy, İstanbul, TÜRKİYE

Email: [tksd@tnn.net](mailto:tksd@tnn.net)

Phone: +90 216 416 76 44 / +90 216 416 94 39

Fax: +90 216 416 92 18

Web: [http://www.tksd.org.tr/index\\_en.html](http://www.tksd.org.tr/index_en.html)  
(English)

Web: <http://www.tksd.org.tr/index.html> (Turkish)

*The Turkish Society of Pathology*

Address: Cerrahpaşa Mah. Koca MustafaPaşa Cad.  
Tekke Sok. Merih İş Merkezi No:45/37 Fatih,  
İstanbul, TÜRKİYE

Email: [posta@tpd.org.tr](mailto:posta@tpd.org.tr)

Phone: +90 532 362 86 82

Fax: +90 (212) 414 30 00 - 21850

Web: <http://www.tpd.org.tr/> (Turkish)

*Molecular Biology Association of Turkey*

Address: Çıksalın Mahallesi Kudüm Sokak No: 25 D: 3  
Halicioğlu, Beyoğlu, İstanbul—TÜRKİYE

Email: [dernek@molbioturk.org](mailto:dernek@molbioturk.org)

Phone: +90 (212) 359 7558

Web: <http://molbioturk.org/en/> (English)

Web: <http://molbioturk.org/> (Turkish)

*Pharmaceutical Manufacturers Association of Turkey*

Address: Nef 09 B Blok Kat: 10 Sanayi Mah. Hümeysra  
Sokak No: 7 34415 Kağıthane, İstanbul—TÜRKİYE

Email: [info@ieis.org.tr](mailto:info@ieis.org.tr)

Phone: +90 212 353 11 20

Fax: +90 212 353 11 41

Web: <http://www.ieis.org.tr/ieis/en/> (English)

Web: <http://www.ieis.org.tr/ieis/tr/> (Turkish)

*Association of Research-Based Pharmaceutical Companies  
(AIFD)*

Address: Barbaros Bulvarı No: 149, TEV Orhan Birman  
İş Merkezi Balmumcu, İstanbul, TÜRKİYE

Email: [info@aifd.org.tr](mailto:info@aifd.org.tr)

Phone: +90 212 267 16 00

Fax: +90 212 273 11 79

Web: <https://www.aifd.org.tr/en/home-page/>  
(English)

Web: <http://www.aifd.org.tr/> (Turkish)

### Poison control centers

*Refik Saydam Hygiene Center—National Poison  
Information Center (UZEM)*

Address: Cemal Gürsel Caddesi No/18 Sıhhiye,  
Çankaya, ANKARA, TÜRKİYE

Email: [bilgi@rshm.gov.tr](mailto:bilgi@rshm.gov.tr)

Phone: 114 (Call Center)

Web: <http://www.rshm.gov.tr/> (Turkish)

*Dokuz Eylül University Faculty of Medicine Drug and  
Poison Information Center*

Address: Dokuz Eylül Üniversitesi Tıp Fakültesi, Tıbbi  
Farmakoloji Anabilim Dalı 35340, Balçova, İZMİR,  
TÜRKİYE

Email: [zdm@deu.edu.tr](mailto:zdm@deu.edu.tr)

Phone: +90 232 412 39 39

Fax: +90 232 259 97 23

Web: <http://web.deu.edu.tr/zdm/eng/> (English)

Web: [http://web.deu.edu.tr/zdm/tr/index\\_dosyalar/  
page0001.html](http://web.deu.edu.tr/zdm/tr/index_dosyalar/page0001.html) (Turkish)

### Legislation and regulation

Handling of chemical compounds, and issues related to the environment and health are regulated by national legislations. It is possible to access all legislation and regulations from the Regulatory Information System ([www.mevzuat.gov.tr](http://www.mevzuat.gov.tr)). Some of the most important laws and regulations related to toxicological sciences are listed below:

*Law 4857/2003. Labour Code*

*Collection of Laws*

*Law 2872/1983: Environment Law*

*Law 4922/1946: Protection of Life and Property at Sea*

*Law 12/1964: Water Pollution by Oil and Other  
Contaminants*

*Law 19461/1987: Health Services Basic Law*

*Regulation on Prevention of Human Health from Harms of  
Inhalant/Solvents, Date: 05.08.2010 No: 27663*

*Regulation on radiation dose limits and working  
principles of personnel working with ionizing radiation  
resources in healthcare services, Date: 05.07.2012,  
No: 28344*

*Regulation on procurement and privacy of personal health  
data, Date: 20.10.2016, No: 29863*

*Regulation on water for human consumption, Date:  
17.02.2005 No: 25730*

*Cosmetic regulation, Date: 23.05.2005, No: 25823*

*Regulation on the safety of medicinal product, Date:  
15.04.2014, No: 28973*

*Regulation on the registration of medicinal products for  
human use, Date: 19.01.2005, No: 25705*

*Regulation on health and safety precautions for works with  
chemical substances, Date: 12.08.2013 No: 28733*

*Duty regulation on chemical, biological, radiological and  
nuclear hazards, Date: 03.05.2012 No: 28281*

*Regulation on the recording, evaluation, permission and limitation of chemicals, Date: 23.06.2017 No: 30105*

*Regulation on chemical substances that are subject to control, Date: 16.06.2004 No: 25494*

*Regulation on the testing methods to be applied in determining physical-chemical, toxicological and ecotoxicological properties of materials and compounds, Date: 11.12.2013, No: 28848*

*Regulation On Restrictions On The Manufacture, Placing On The Market And Use Of Certain Dangerous Substances, Preparations And Articles, Republic of Turkey Ministry of Environment and Urbanization, Date: 23.06.2017 No: 30105*

*Regulation on the Classification, Labeling and Packaging of Materials and Mixtures, Republic of Turkey Ministry of Environment and Urbanization, Date: 11.12.2013, No: 28848*

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