



Issues in Toxicology

# Chemical Warfare Toxicology

Volume 1: Fundamental Aspects

Edited by Franz Worek, John Jenner  
and Horst Thiermann



**Chemical Warfare Toxicology**  
**Volume 1: Fundamental Aspects**

## Issues in Toxicology

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# *Chemical Warfare Toxicology*

## *Volume 1: Fundamental Aspects*

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# *Preface*

The international community has undertaken great efforts to abandon chemical weapons. This endeavour resulted in an agreement, the Chemical Weapons Convention, which entered into force on 29th April 1997 and has been ratified and implemented by, at present, 192 state parties. This convention bans the production, stockpiling and use of chemical weapons, and up to now more than 90% of the declared stockpiles have been destroyed.

Despite this great success, recent events have demonstrated the continuing threat of chemical warfare agents. The repeated homicidal use of the chemical warfare nerve agent sarin in Syria in 2013, the suspected perpetual use of chlorine in Syria and most recently supposed attacks with sulphur mustard in Syria and Iraq illustrate the capacity and intent to deploy chemical warfare agents against military units and civilians.

The decreasing likelihood of state use of chemical weapons and increasing interest of terrorist groups in using toxic chemicals as weapons will have a great impact on the spectrum of future threat agents, modes of dissemination and, consequently, preparation of countermeasures for military forces and the general population.

The intention of this book, *Chemical Warfare Toxicology* is to provide an overview of the toxicological properties of relevant chemical warfare agents including nerve, blistering and lung agents, and opioids. The main focus of this multi-author book is to give an update on recent findings for a broad range of topics related to chemical warfare agents. This includes chapters on new insight into the toxicology and pathophysiology of nerve, blistering and lung agents, established and experimental means for diagnosis and verification of exposure to chemical warfare agents, novel approaches for the treatment of nerve agent poisoning, and an update on the use of, and human exposure to, chemical warfare agents.



The chapters of this book are authored by experts covering the broad range of topics related to chemical warfare agents. The authors are regarded as authorities in the fields of toxicology and military medicine, presenting state of the art information for academic, clinical and governmental audiences.

The first volume, *Fundamental Aspects*, covers the fundamentals of the toxicology of nerve agents and vesicants whilst the second volume, *Management of Poisoning*, describes aspects of the treatment after exposure to these and other chemical warfare agents.

# *References to Material in The National Archives*

Over the years, many of the reports produced as accounts of Government research have found their way into the public records of the originating nation. In the USA the military reports relating to Chemical Warfare Agents that are available for public review are indexed by the Defense Technical Information Center (DTIC) and can be accessed *via* the website <http://www.dtic.mil>. In the UK, similar reports are held in The National Archives and can be accessed through the website <http://www.nationalarchives.gov.uk>. In this book, the references to reports in The National Archives (UK) are referenced using the system used by the archive, so that each report can be searched for and located using its unique reference number. The number consists of a two letter code identifying the contributing department and a series number. The series number may consist of two numbers separated by a forward slash. A piece may be a single item or a collection of documents. If the reference is part of a collection, an additional item number may be added to identify the document within the piece. For example, WO 1234/56/7 would indicate item 7 of piece 1234/56 entered into the archive by the War Office.



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