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Chemical Warfare Agents. Classes and Targets

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Highlights

- Chemical warfare agents are acutely toxic substances. There exist two different types of acute toxic action: nonspecific cytotoxic mechanisms with multiple chemo-biological interactions versus specific mechanisms that tend to have just a single or a few target biomolecules. TRPV1- and TRPA-receptors are today believed to play an important role for tissue irritation, inflammation and damage.

Abstract

Synthetic toxic chemicals (toxicants) and biological poisons (toxins) have been developed as chemical warfare agents in the last century. At the time of their initial consideration as chemical weapon, only restricted knowledge existed about their mechanisms of action. There exist two different types of acute toxic action: nonspecific cytotoxic mechanisms with multiple chemo-biological interactions versus specific mechanisms that tend to have just a single or a few target biomolecules. TRPV1- and TRPA-receptors are often involved as chemosensors that induce neurogenic inflammation. The present work briefly surveys classes and toxicologically relevant features of chemical warfare agents and describes mechanisms of toxic action.

Keywords: Chemical weapon; chemical warfare agent; TRP; toxic; neurogenic inflammation.

1. Introduction

Potential chemical warfare agents have been selected in the past on the basis of their high acute toxicities and optimized as weapons with regard to their physicochemical properties and technical features. Ample information is available on the history [1], relevant agents [2-6], physicochemical aspects [7], analytics [8], preparedness [9], medical treatment [10] and international regulation [11].