

## Pesticide toxicity: a mechanistic approach

[Article - PDF](#)[Article - HTML](#)[Article - XML](#)**Published** Nov 8, 2018**DOI** <https://doi.org/10.17179/excli2018-1710>**Volodymyr I. Lushchak**

Department of Biochemistry and Biotechnology, Vasyl Stefanyk Precarpathian National University, 57 Shevchenko Str., Ivano-Frankivsk, 76018, Ukraine

<http://orcid.org/0000-0001-5602-3330>

**Tetiana M. Matviishyn**

Department of Biochemistry and Biotechnology, Vasyl Stefanyk Precarpathian National University, 57 Shevchenko Str., Ivano-Frankivsk, 76018, Ukraine

**Viktor V. Husak**

Department of Biochemistry and Biotechnology, Vasyl Stefanyk Precarpathian National University, 57 Shevchenko Str., Ivano-Frankivsk, 76018, Ukraine

**Janet M. Storey**

Institute of Biochemistry, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, Canada

**Kenneth B. Storey**

Institute of Biochemistry, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, Canada

## Abstract

Pesticides are known for their high persistence and pervasiveness in the environment, and along with products of their biotransformation, they may remain in and interact with the environment and living organisms in multiple ways, according to their nature and chemical structure, dose and targets. In this review, the classifications of pesticides based on their nature, use, physical state, pathophysiological effects, and sources are discussed. The effects of these xenobiotics on the environment, their biotransformation in terms of bioaccumulation are highlighted with special focus on the molecular mechanisms deciphered to date. Basing on targeted organisms, most pesticides are classified as herbicides, fungicides, and insecticides. Herbicides are known as growth regulators, seedling growth inhibitors, photosynthesis inhibitors, inhibitors of amino acid and lipid biosynthesis, cell membrane disrupters, and pigment biosynthesis inhibitors, whereas fungicides include inhibitors of ergosterol biosynthesis, protein biosynthesis, and mitochondrial respiration. Insecticides mainly affect nerves and muscle, growth and development, and energy production. Studying the impact of pesticides and other related chemicals is of great interest to animal and human health risk assessment processes since potentially everyone can be exposed to these compounds which may cause many diseases, including metabolic syndrome, malnutrition, atherosclerosis, inflammation, pathogen invasion, nerve injury, and susceptibility to infectious diseases. Future studies should be directed to investigate influence of long term effects of low pesticide doses and to minimize or eliminate influence of pesticides on non-target living organisms, produce more specific pesticides and using modern technologies to decrease contamination of food and other goods by pesticides.

### How to Cite

Lushchak, V. I., Matviishyn, T. M., Husak, V. V., Storey, J. M., & Storey, K. B. (2018). Pesticide toxicity: a mechanistic approach . *EXCLI Journal*, 17, 1101-1136. <https://doi.org/10.17179/excli2018-1710>

[More Citation Formats](#)

Issue

Vol 17 (2018)

Section

Review articles



This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

Authors who publish in this journal agree to the following terms:

- The authors keep the copyright and grant the journal the right of first publication under the terms of the Creative Commons Attribution license, [CC BY 4.0](#). This licence permits unrestricted use, distribution and reproduction in any medium, provided that the original work is properly cited.
- The use of general descriptive names, trade names, trademarks, and so forth in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.
- Because the advice and information in this journal are believed to be true and accurate at the time of publication, neither the authors, the editors, nor the publisher accept any legal responsibility for any errors or omissions presented in the publication. The publisher makes no guarantee, express or implied, with respect to the material contained herein.
- The authors can enter into additional contracts for the non-exclusive distribution of the journal's published version by citing the initial publication in this journal (e.g. publishing in an institutional repository or in a book).

Powered by



[Make a Submission](#)

USER

Username

Password

☐ Remember me

[Login](#)

JOURNAL CONTENT

Search

Search Scope

All

[Search](#)

## BROWSE

[By Issue](#)

[By Author](#)

## EXCLI Journal has been added to

[Directory of Open Access Journals \(DOAJ\)](#)

[Electronic Journals Library \(EZB\)](#)

[Web of Science](#)

[SCOPUS](#)

[Pubmed Central](#)

[Pubmed](#)

[EBSCO Academic Search](#)

[SCImago](#)

[LIVIVO](#)

[BASE](#)

## Impact Factor

**2013: 0.728**

**2014: 0.857**

**2015: 1.292**

**2016: 1.462**

**2017: 2.424**

EXCLI Journal is a platinum open access journal. There are neither fees for authors submitting their papers nor fees for readers accessing PDFs of the published papers.

Articles published in EXCLI Journal are licensed under a [Creative Commons Attribution 4.0 International License](#).

