



## Molecular Mechanism of Action of Neonicotinoid Insecticides

Guest Editor:

**Prof. Dr. Steeve Hervé Thany**

Laboratoire de Biologie des  
Ligneux et des Grandes Cultures  
(LBLGC), Université d'Orléans,  
UPRES EA 1207-USC INRA, Rue  
de Chartres, BP 6759, 45067  
Orléans, France

Deadline for manuscript  
submissions:

**closed (31 May 2022)**

### Message from the Guest Editor

Neonicotinoid insecticides are used worldwide and have been demonstrated as toxic to beneficial insects such as honeybees. Their effectiveness is predominantly attributed to their high affinity for insect neuronal nicotinic acetylcholine receptors (nAChRs). Mammalian neuronal nAChRs are of major importance because cholinergic synaptic transmission plays a key role in rapid neurotransmission, learning and memory processes, and neurodegenerative diseases. Several lines of evidence have demonstrated that neonicotinoid insecticides can modulate cholinergic functions through neuronal nAChRs. It has been found that the neonicotinoids thiamethoxam and clothianidin can activate the release of dopamine in rat striatum. In some contexts, such as neurodegenerative diseases, they can disturb the neuronal distribution or induce oxidative stress, leading to neurotoxicity.

In this special issue, we aim to explore the molecular mechanism of action of neonicotinoid insecticides from chemical analyses, toxicology, to molecular and cellular levels.





an Open Access Journal by MDPI

## Editor-in-Chief

### Prof. Dr. Maurizio Battino

Department of  
Odontostomatologic and  
Specialized Clinical Sciences,  
Sez-Biochimica, Faculty of  
Medicine, Università Politecnica  
delle Marche, Via Ranieri 65,  
60100 Ancona, Italy

## Message from the Editor-in-Chief

The International Journal of Molecular Sciences (*IJMS*, ISSN 1422-0067) is an open access journal, which was established in 2000. The journal aims to provide a forum for scholarly research on a range of topics, including biochemistry, molecular and cell biology, molecular biophysics, molecular medicine, and all aspects of molecular research in chemistry. *IJMS* publishes both original research and review articles, and regularly publishes special issues to highlight advances at the cutting edge of research. We invite you to read recent articles published in *IJMS* and consider publishing your next paper with us.

## Author Benefits

**Open Access:** free for readers, with article processing charges (APC) paid by authors or their institutions.

**High Visibility:** indexed within Scopus, SCIE (Web of Science), PubMed, PMC, MEDLINE, Embase, CAPlus / SciFinder, and other databases.

**Journal Rank:** JCR - Q1 (*Biochemistry & Molecular Biology*) / CiteScore - Q1 (*Inorganic Chemistry*)

## Contact Us

*International Journal of Molecular  
Sciences* Editorial Office  
MDPI, St. Alban-Anlage 66  
4052 Basel, Switzerland

Tel: +41 61 683 77 34  
www.mdpi.com

mdpi.com/journal/ijms  
ijms@mdpi.com  
X@IJMS\_MDPI