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## Recent Advances in the Use of Biomarkers as an Ecotoxicology Set of Tools

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Deadline for manuscript  
submissions:  
**closed (31 March 2023)**

### Message from the Guest Editors

Dear Colleagues,

The development and application of biomarkers as tools to study early warning organisms' response to environmental pollution has become crucial to understand some response patterns as well as to define modes of action of certain chemical compounds. Some biomarkers of great ecological relevance are related to the immune response, oxidative stress, genotoxicity, energy metabolism, endocrine disruption, genotoxicity, and immunotoxicity. More recently, the use of a battery of defense and damage biomarkers has allowed us not only to evaluate the single effects of chemical compounds on organisms but also effects induced by chemical mixtures, including those of microplastics acting as vectors for organic and inorganic contaminants. Recent research has been using the information generated by the analysis of biomarkers in areas such as animal physiology, aquaculture, nutrition, and biotechnology. We are inviting research studies presenting novel aspects of biomarker application in ecotoxicology, studies of comparative physiology, and proposals of novel methodologies and approaches to link individually biomarkers with higher levels of biological organization.



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**Special** Issue



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## Message from the Editor-in-Chief

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