

## Special Issue

# Toxicology Research: Understanding and Predicting Compound-Induced Toxicity

### Message from the Guest Editor

Mechanistic toxicology has evolved into a more integrative vision, moving beyond isolated molecular or cellular events to a broader understanding of toxicity across biological levels in accordance with a systems perspective. The framework involving adverse-outcome pathways plays a central role in this shift, offering a sequentially organized level of biological associations, with a molecular initiating event triggering a series of key events and an observable adverse outcome at the individual or population level. This framework supports the advancement of next-generation risk assessment and new approach methodologies, which include *in silico*, *in vitro*, and non-mammalian *in vivo* tools. Together, these approaches aim to improve toxicity testing, enabling the identification of early and key effect biomarkers for the better protection of human health. In this Special Issue, we aim to highlight recent progress in the application of adverse-outcome pathway to predictive toxicology, emphasizing mechanistic insight and innovation across emerging and traditional toxicological platforms.

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### Guest Editor

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