Developing a Defined Approach for Eye Irritation Testing

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Regulatory acceptance and implementation of new approach methodologies depend on public-private partnerships, which enable communication and cooperation among federal agencies and the private sector. To that end, the PETA Science Consortium International, the Interagency Coordinating Committee on the Validation of Alternative Methods, the National Toxicology Program Interagency Center for the Evaluation of Alternative Toxicological Methods, and CropLife America companies are collaborating to assess the applicability of in vitro and ex vivo test methods to assess eye irritation potential for agriculture pesticide formulations. The goal is to identify methods most appropriate for human-relevant defined approaches to hazard evaluation that do not use animal data. To date, sixteen formulations have been tested in the bovine corneal opacity and permeability, neutral red release, isolated chicken eye, EpiOcular, and porcine cornea reversibility test methods. Results were compared to the hazard classification assigned based on the in vivo rabbit test. For each test method, at least one formulation was discordant with the in vivo rabbit classification, but none of the methods yielded discordant results for all tested formulations. Initial results indicate that certain test method combinations may be used to predict in vivo outcomes. Additional analyses will focus on physicochemical properties and composition of tested formulations to determine if there are any common features that impact in vitro test method performance. These data will be considered in the context of a recent review of ocular anatomy and mechanisms of chemically induced ocular irritation in humans and other species, which supported reduced reliance on comparisons to rabbit data to show the validity of other methods, and instead a focus on human-relevance and assay reliability.
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