Poster presentation abstract

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The State-of-the-Science of Alternative Methods for Evaluating the Toxicity and Efficacy of Ectoparasiticides

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The development of veterinary ectoparasiticides involves the use of large numbers of animals to evaluate toxicity and efficacy. Regulatory guidelines state that a variety of health effects tests must be conducted for new flea and tick control products intended to be applied to companion animals, including acute, subchronic, and chronic toxicity; mutagenicity; carcinogenicity; reproductive toxicity; and margin of safety determinations. Regulatory requirements further include that active ingredients and product formulations must be assessed for efficacy using dogs and cats. Label claims, such as duration of parasite control and efficacy when combined with other products, must be supported with data, which are usually obtained from tests on animals.

Alternative methods for toxicity testing, including an additive equation for predicting the acute systemic toxicity of formulated products based on the toxicity of its ingredients and in vitro methods for eye irritation, skin irritation, and skin sensitization, are currently under evaluation or have already been approved for use to satisfy many endpoints. For efficacy testing, artificial membrane systems have been developed to evaluate both oral and topical ectoparasiticides that are added to the blood in the in vitro system or applied to the membranes. Studies demonstrate the scientific advantages of membrane systems, such as greater control and standardization and the direct observation of the attachment, feeding, reproductive output, and mortality of parasites. However, there remain many challenges to implementation of artificial membrane systems.

This poster provides a review of the state-of-the-science of alternative methods, examples of the use of non-animal methods in scientific publications and regulatory applications, and recommendations for steps that can be taken to transition to non-animal methods.

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