

CEC04: Inflammation as a mediator of toxic responses

Chairs:

Emanuela Corsini, Italy | Ron Tjalkens, US

Presentations:

Inflammation as a mediator of toxic responses

Marie Cumberbatch, Immune Insight, Alderley Park, UK

The multiple facets of skin inflammation: from direct toxic insult to specific immune responses

Marc Pallardy, Université Paris-Sud, Châtenay-Malabry, France

Innate immune inflammatory signaling in glial cells modulates chemical neurotoxicity

Ron Tjalkens, Colorado State University, Fort Collins, US

Evaluating cytokines in immunotoxicity testing

Emanuela Corsini, University of Milan, Milan, Italy

Abstract:

Inflammation is an important biological process involved in many target organ toxicities. The acute inflammatory response is host protective and involves edema, leukocyte recruitment and the elimination of microbes and cellular debris. However, chronic inflammation can cause collateral tissue damage with fibrosis and eventual loss of function of the tissue and organ. This symposium will address the role of inflammatory mediators in the response to toxicants, illustrated by several case studies. The first speaker will set the scene by summarizing the current science of inflammation and its mediators such as cytokines, prostaglandins, nitric oxide and oxidative species. The second speaker will describe different mechanisms of inflammation in the skin which can result from exposure to chemicals. This inflammation can be acute or chronic and both the innate and the adaptive immune systems can play a role via collaboration with adjacent cells such as keratinocytes, fibroblast and endothelial cells. The third speaker will describe how many neurotoxic effects of drugs and environmental chemicals are significantly modulated by inflammatory responses of glial cells in the brain. Normally, astrocytes and microglia maintain neuronal homeostasis but under conditions of toxicological and other types of stress, glial cells can adopt a reactive neurotoxic inflammatory phenotype that promotes neuronal injury. Finally, since cytokines are intermediate mediators involved in all immune responses, the fourth speaker will describe how cytokine production can be used to assess both immunosuppression and inappropriate immunostimulation. Importantly, new approaches to measuring inflammatory mediators offers the opportunity to transform immunotoxicity assessments from a system based on animal testing to one founded primarily on in vitro methods that evaluate changes in immunologic processes. Overall, this symposium will present an integrated assessment of the issue, the basic science and its application to understanding mechanisms of inflammation and to identifying immunomodulatory compounds. The symposium will be of interest to academia, regulators and industry at all levels of knowledge and experience.