



SS11

Alternative animal testing strategies

Scott Belanger¹, Stefan Scholz²

¹The Procter & Gamble Company, CINCINNATI, OH, United States of America

²UFZ, Leipzig, Germany

Animal alternative methods & strategies based on 3R principles (reduce, replace, refine) have received increasing attention for use in environmental risk assessment (ERA), hazard screening and effluent toxicity assessment. Target organisms have included fish, amphibians, and birds for endpoints such as bioaccumulation, acute and chronic toxicity, and endocrine disruption. In this session, sponsored by the SETAC Animal Alternatives in ERA Advisory Group, we continue to explore the state of the science in method and strategy development. Use of Adverse Outcome Pathway and genomic analysis, advances for in vitro approaches, statistical modeling, and improvements in use of existing data among others are within the scope of this session.

General context of the topic

Pressure on animal testing has traditionally been the purview of mammalian toxicological science. In the past few years, needs have emerged in the realm of environmental safety as well. The issue has been primarily driven by European legislation, including the EU Animal Protection Act, the 7th Amendment to the EU Cosmetics Directive, country-level legislation in Germany and the UK, and the adopted European chemical legislation (REACH). Additional toxicity data are sought in many of these legislative efforts, while also promoting non-animal testing / alternative strategies. Pressures outside of toxicology, notably sport-fishing, whaling, and fish welfare in commercial rearing environments have also influenced social and ethical discussions in environmental animal alternatives. Anticipated testing needs for chemical management programs (categorized members of the Canadian Domestic Substance List, REACH, and on-going OECD/USEPA/Japan HPV Challenge programs) have highlighted the need for substantial increases in fish toxicity data generation in particular. There is a clear need to develop alternatives that are equally predictive, quicker and use fewer animals than existing standard toxicity tests for chemicals and effluents. As with higher vertebrate animal alternatives, the balance sought is to reduce animal use without impairing or increasing uncertainty in risk assessment. While these needs are particularly focused on fish based on sheer numbers of animals used for research, safety testing, and effluent assessments, the expectation is that pressure will continue to increase on use of amphibians and birds as well.

In addition to these regulatory and social contexts, there has been a rapidly expanding interest in the scientific underpinnings of mode of action, toxicity pathways, and system biology expressed in the Toxicity Testing in the 21st Century program (aka, Tox21) developed in the US by the National Academy of Sciences. Now a more global effort, these general concepts have evolved to encompass Adverse Outcome Pathways and other concepts with roots in environmental science. The role of animal alternative methods and strategies is equally clear here as tools are developed and exploited to reduce animal testing while improving mechanistic understanding of toxicity to environmental organisms.

Relation to SETAC in general and the topic of the World Congress

SETAC has a strong role to play in bringing together the leading edge sciences whose goal is to develop and implement animal alternative methods and strategies. SETAC formed a Global Science Advisory Group on Animal Alternatives in Environmental Science

in 2008. Every SETAC Europe and SETAC North America regional meeting has hosted a session on this topic as did the most recent World Congress in 2008. Interest by the SETAC membership is very high and has made these sessions amongst the most popular at each meeting (the recent SETAC Europe regional meeting in 2011, for example, had approximately 50 proposed platform and poster contributions). The AA Advisory Group hosted a short course at the Milan meeting and approximately 20 scientists attended. The Advisory Group formally meets at SETAC Europe and NA meetings and informally through other organizations (HESI, SOT, etc.).

As to the relationship of this topic area to the World Congress, with an emphasis on sustainability and the integration of science, policy and people, there probably is no topic as well suited to meet the theme. Animal testing and ethics is squarely in the minds of policy makers, the public, and scientists are developing the science to support future directions. This is clearly a global phenomenon and one in which developments in one part of the world are quickly translated to developments and pressures elsewhere.