Matt Dent: Using Next Generation Risk Assessment to make Safety Decisions for Consumer Products

The publication of the 2007 US National Research Council report "Toxicity Testing in the 21st Century: A Vision and a Strategy" was a challenge to modernize the approaches used in safety decision making. The advent of new *in vitro* and computational techniques provides the opportunity for this vision to become a realty, and to render traditional toxicological animal studies obsolete. This transformation has been exemplified in the cosmetics sector, where driven by consumer preference and legislative action, the application of non-animal approaches in safety assessment has increased significantly in recent years. Progress in this industry has been possible due to use of exposure-led, risk-based approaches, which focus on the context of the safety decision that needs to be made. Depending on this context and the *in vitro* data obtained, we can use non-animal approaches to assure the safety of cosmetics today. In addition to using established non-animal techniques, the usefulness of novel approaches combining exposure tools such as physiologically based kinetic modelling with measures of *in vitro* bioactivity such as high throughput transcriptomics show real promise as a viable alternative to animal tests. As the science continues to develop, confidence in the robustness of these assessments will increase to support more diverse decisions and exposure scenarios. An overview of the progress that has been made in the cosmetics industry to address systemic toxicity will be given, and the tools and approaches that are proving invaluable to decision making will be discussed, along with areas for future research.