THE REACH CONCEPT AND ITS IMPACT ON TOXICOLOGICAL SCIENCES

Abstract

Currently, comprehensive toxicological data are available only for a small percentage of the 30,000 substances produced in volumes of 1–100 tons per year in the EU. Substances with inadequate safety data sets may pose a risk to employees, consumers and the environment. To improve this unsatisfactory situation the European Commission put forward a draft concept that will probablybecome law in 2006. The acronym of this concept is REACH standing for Registration, Evaluation and Authorization of Chemicals.The aim of REACH is to systematically evaluate the risk of approximately 30,000 chemical substances produced, used or imported in quantities of 1–100 tons per year. From a practical point of view the testing requirements for these chemicals are one of the mostimportant parts of the REACH proposal. The latter progressively increase with the volume of chemical substances, including, e.g.acute, subchronic and chronic toxicity tests. Without doubt REACH will provide an important contribution to health protection for workers and consumers. But perhaps even more importantly,REACHoffers an opportunity to optimize and innovate testing strategiesfor chemicals. Such novel techniques are in particular RNA expression profiling, proteome analysis and metabonomics to describealterations in gene or protein expressions patterns or in metabolite concentrations in response to toxic stimuli. Promising data have been published indicating that these techniques might identify hepato- or nephrotoxic compounds or even carcinogens differentiatingbetween genotoxic and non-genotoxic substances. However, so far only a relatively small number of selected typical substanceswith well known toxic mechanisms has been tested. Therefore, the most promising innovative techniques should be optimized andvalidated by investigating a series of other typical but also untypical substances. In a further step a supplementary research programto REACH should be launched including promising innovative techniques (e.g. genomics, proteomics, metabonomics) but also other alternative methods (e.g. in vitro or QSAR), concentrating on the same substances that have to be tested by conventional animalstudies in the mandatory part of REACH. In the present review we summarize key features of REACH, and discuss possibilities forthe development of improved techniques and integrated strategies for toxicity testing.