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GC/MS metabolomic analysis of biological samples of animals in toxicity studies

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Metabolomics is a comprehensive analysis method for endogenous metabolites, such as amino acids, organic acids, and fatty acids within organisms, so it can be used for analysis of biological samples obtained in toxicity studies in animals. It provides information of toxic mechanism, identification of target organ, and candidate marker for toxicity. GC-MS is one of the metabolomic analysis and has advantage in rapid measurement of various metabolites within 30 min, abundant information of spectrum data for identification of metabolites, and high reproductively, accuracy and dynamic range of analysis, so it was selected as the main metabolomics analysis methods for toxicity studies. Non-target analysis of plasma and urine samples revealed dosage of chemicals affected concentration of endogenous metabolites dose-dependently, and recovery of change was observed. Target analysis was then developed for conducting rapid pathway analysis of metabolites, because it enables quantitative comparison of toxicity, classification of toxicity and cross-omics analysis. Organ toxicity was especially important for toxicity studies, so background data of totally 29 tissues were obtained for their endogenous metabolites with large difference in metabolite profiles. These improvements of the analytical procedure including establishment of the targeted analysis resulted in more effective toxicity assessment and mechanism analysis of development compound. In this presentation, the GC-MS metabolomics analysis and improvement of analytical method will be provided.

Biography

Hirohisa Nagahori received his B.S., M.S. and Ph.D. from the University of Tokyo, Japan. He has been employed in Environmental Health Science Laboratory of Sumitomo Chemical Company for 18 years and is in charge of biochemistry and metabolism studies as Senior Research Associate. He was Visiting Scientist of the Hamner Institutes for Health Sciences in 2010 to 2011. He has published more than 10 papers in reputed journals.

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