S37-2 **A New Metabolomics Approach and Its Application to Diagnosis**

◯Tomoyoshi SOGA [1]

[1] Inst. Adv. Biosci., Keio Univ.

Metabolomics has become a powerful new tool for gaining insights into cellular and physiological responses. Here we have developed a comprehensive and quantitative analysis method based on capillary electrophoresis mass spectrometry (CE-MS). Metabolites are first separated by CE based on their charge and size and then selectively detected at their exact mass molecular ions by TOFMS detector. We applied the CE-TOFMS to profile liver metabolites following acetaminophen- induced hepatotoxicity and revealed ophthalmate as a sensitive indicator of reduced glutathione (GSH) depletion. We globally detected 1,859 peaks in mouse liver extracts, and highlighted multiple changes in metabolite levels, including an activation of the ophthalmate biosynthesis pathway. We confirmed that ophthalmate was synthesized from 2-aminobutyrate through consecutive reactions with g-glutamylcysteine and glutathione synthetase like GSH. Changes in ophthalmate level in mouse serum and liver extracts were closely correlated and ophthalmate levels increased significantly in conjunction with glutathione consumption. Our results specifically indicate that serum ophthalmate is a sensitive indicator of hepatic GSH depletion, and may be a new biomarker for oxidative stress. Application of this biomarker to clinical samples will be also discussed.