

S03-1 Development of high sensitivity methods for unstable physiologically active compounds

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The activity of oxidizing substances and antioxidant substances which are present in living organisms is maintained at a constant balance to keep homeostasis. However, when the balance between oxidizing substances such as reactive oxygen species (ROS) and antioxidants collapse, and the oxidizing substances are excessive, various conditions such as arteriosclerosis, carcinogenesis and lifestyle-related diseases are caused. Thus, ROS are important substances to assess the biological redox status, disease state and progression. Various methods have been developed to ascertain the oxidation state in the living body. However, due to its high oxidizing and reactivity, ROS disappears immediately *in vivo*, and it is considered difficult to evaluate the exposure amount *in vivo*. In this study, we developed analytical methods to evaluate the state of unstable physiologically active substances such as ROS and reactive nitrogen species (RNS) biomarkers *in vivo*. It was shown that biomarkers were able to exist at a low concentration from prior studies. Therefore, we examined derivatization reagents for mass spectrometry further increase the sensitivity by a mass spectrometer capable of high sensitivity and selective measurements. The methods we developed enabled us to determine ROS and RNS state in biological samples.