

Biomedical Application of Developing Drugs by Assessment of Antioxidant Property with Electron Spin Resonance Spectroscopy

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It is well known that reactive oxygen species (ROS)-induced oxidative stress has been implicated as a potential contributor to various pathophysiological phenomena. Electron spin resonance (ESR) spectroscopy has been recognized as one of the most powerful techniques for the detection of free radicals, including ROS, in biological tissues and cells. We have developed an ESR-based technique to detect free radical reactions in biological systems *in vitro* or *in vivo*. We have already reported that results from our laboratory using *in vitro* or *in vivo* ESR techniques could serve as a useful basis for measuring oxidative stress induced by ROS in the biological system. Thus, we could measure the degree or characterization of antioxidant property for evaluating oxidative stress using ESR technique. In this symposium, we can show the ESR biomedical application about the investigation of the antioxidant properties of drugs using the *in vitro* ESR spin-trapping technique and *in vivo* L-band ESR or ESR imaging technique. We would demonstrate that ESR techniques could be applicable to the assessment of antioxidant properties of drugs used for clinical treatment of ROS-induced diseases following their investigation in the future.