Near infrared low level light detection system for singlet oxygen

Singlet oxygen enable to specifically detection by means of a weak emission at the wavelength of 1.27 μm. The influence of the light-emitting material such as a protein is extremely small in the near infrared region. The emission of singlet oxygen specially allow from the standpoint of spectroscopic measurement. Singlet oxygen enables to understand the mechanism of carcinogenesis and to develop of antioxidant agent. However, a commercially available detection system is too expensive and too large for carrying. Near infrared low level light detection system does not become widely used.

The portable near infrared low level light detection system for 1.3 μm was developed. The near infrared wavelength band doesn’t allow to use in order to deviate from the wavelength sensitivity band of the silicon-based CCD. A near-infrared photomultiplier tube doesn’t popularize for high prices. The system achieved low cost and compact by using a photodiode of an optical communication device. A conventional near infrared low level light detection system employ liquid nitrogen in order to increase the detection sensitivity. Liquid nitrogen involves risks for frostbite or asphyxia in case of using. Our high sensitive system without liquid nitrogen was developed at a low cost. Detection system has succeeded in detecting Pico watt level light using LED as an optical source. This system will be expected to popularize as a near infrared spectral instrument.