# Decontamination of chemical and biological warfare agents

Yasuo Seto (National Research institute of Police Science)

Chemical and biological warfare agents (CBWA's) are diverse in nature; volatile acute low-molecular-weight toxic compounds, chemical warfare agents (CWA's, gaseous choking and blood agents, liquid nerve gases and blister agents), biological toxins (nonvolatile low-molecular-weight toxins, proteinous toxins) and microbes (bacteria, viruses, rickettsiae). In the consequence management against chemical and biological terrorism, speedy decontamination of victims, on-site facilities and equipment is required for the minimization of the damage. In the present situation, washing the victims and contaminated materials away with large volumes of water is the basic way, and additionally hypochlorite salt solution is used for decomposition of CWA's, and ultraviolet irradiation, aldehyde solution, oxidizing agents (hypochlorite, hydrogen peroxide) and detergent solution are used for the sterilization and disinfection of biological warfare agents. However, it still remains unsolved how to dispose large volumes of waste water, and the decontamination reagents have serious limitation of high toxicity, despoiling nature against the environments, long finishing time and non-durability in effective decontamination. Namely, the existing decontamination system is not effective, nonspecifically affecting the surrounding non-target materials. Therefore, it is the urgent matter to build up the usable decontamination system surpassing the present technologies. The symposiast presents the on-going joint project of research and development of the novel decontamination system against CBWA's, in the purpose of realizing nontoxic, fast, specific, effective and economical terrorism on-site decontamination. The projects consists of (1) establishment of the decontamination evaluation methods and verification of the existing technologies and adaptation of bacterial organophosphorus hydrolase, (2) development of adsorptive elimination technologies using molecular recognition tools, and (4) development of deactivation technologies using light catalysis.