Genotoxicity study of benzophenone and its metabolites by mouse lymphoma thymidine kinase ($tk^{+/-}$) gene assay (MOLY) in mammalian cell system

Hee-Kyung Jeon[1], Youn-Jung Kim[1], Hye-Jung Yun[1], Eun-Young Kim[1], Kyung-Hee Choi[2] and Jae-Chun Ryu[1]

[1]*Toxicology Laboratory, Korea Institute of Science & Technology P.O. Box 131, Chengryang, Seoul, 130-650, Korea*

[2]*National Institute of Environmental Research*

Benzophenone and its derivatives have been widely used as sources of chemical synthesis, ultraviolet protection products, and cosmetic ingredients for ultraviolet absorption. Benzhydrol and *p*-hydroxybenzophenone have been shown to be reductive and hydroxylated metabolites of benzophenone, respectively, however, the biological actions of these compounds are not well known. By the previous reports, benzophenone was not mutagenic in the Ames test using various strains of *Salmonella typhimurium* or in the *Escherichia coli* pol A assay.

The mouse lymphoma thymidine kinase ($tk^{+/-}$) gene assay (MOLY) using L5178Y $tk^{+/}$ mouse lymphoma cell line is one of the mammalian forward mutation assays. It is well known that MOLY has many advantages and more sensitive than the other mammalian forward mutation assays and was used as high throughput toxicity screening (HTTS) tool in our laboratory.

Benzophenone at 150-10 μg/mL concentrations was not shown significant mutagenic effect in the absence of S-9 metabolic activation system. Benzhydrol at 300-25 μg/mL concentrations was not shown significant mutagenic effect in the absence and presence of S-9 metabolic activation system. *p*-Hydroxy-benzophenone at 313-40 and 157-20 μg/mL concentrations was not shown significant mutagenic effect in the absence and presence of S-9 metabolic activation system, respectively. Therefore, we suggest that benzophenone and its metabolites have no genotoxic effects in mouse lymphoma cell line used in this study.