# Phosphine-induced oxidative damage in rats: Attenuation by melatonin

葉錦瑩

Hsu CH;Han BC;Liu MY;Yeh CY;Casida JE.

摘要

**Abstract**

Phosphine (PH(3)), from hydrolysis of aluminum, magnesium and zinc phosphide, is an insecticide and rodenticide. Earlier observations on PH(3)-poisoned insects, mammals and a mammalian cell line led to the proposed involvement of oxidative damage in the toxic mechanism. This investigation focused on PH(3)-induced oxidative damage in rats and antioxidants as candidate protective agents. Male Wistar rats were treated ip with PH(3) at 2 mg/kg. Thirty min later the brain, liver, and lung were analyzed for glutathione (GSH) levels and lipid peroxidation (as malondialdehyde and 4-hydroxyalkenals) and brain and lung for 8-hydroxydeoxyguanosine (8-OH-dGuo) in DNA. PH(3) caused a significant decrease in GSH concentration and elevation in lipid peroxidation in brain (36-42%), lung (32-38%) and liver (19-25%) and significant increase of 8-OH-dGuo in DNA of brain (70%) and liver (39%). Antioxidants administered ip 30 min before PH(3) were melatonin, vitamin C, and beta-carotene at 10, 30, and 6 mg/kg, respectively. The PH(3)-induced changes were significantly or completely blocked by melatonin while vitamin C and beta-carotene were less effective or inactive. These findings establish that PH(3) induces and melatonin protects against oxidative damage in the brain, lung and liver of rats and suggest the involvement of reactive oxygen species in the genotoxicity of PH(3).