CADMIUM-INDUCED CYTOTOXICITY IN AML 12 MOUSE HEPATOCYTES

Waneene C. Dorsey¹, Clement Yedjou² and Paul B. Tchounwou²

¹Molecular Toxicology Research Laboratory, Grambling State University, Grambling, LA, USA
²Molecular Toxicology Research Laboratory, NIH-Center for Environmental Health, College of Science, Engineering and Technology, Jackson State University, Jackson, MS, USA

Abstract: Cadmium (Cd) is a ubiquitous trace metal that is found in environmental media such as the air, water, and soil. Although Cd is a natural occurring element, anthropogenic activities have contributed to cadmium elevations in the environment. Industrial applications of copper, lead, and zinc cause an influx of Cd as an environmental contaminant. Cd is also found in agricultural products grown in contaminated soil. Upon inhalation and oral exposure, Cd can linger in the human body for more than 10 years. As a systemic toxicant, chronic Cd exposure can manifest as renal damage, pulmonary emphysema, atherosclerosis, testicular damage, and fetal abnormalities. The literature is scarce by which Cd exerts its toxic mechanisms at the cellular and molecular levels. In the present study, we hypothesized that Cd is acutely toxic to AML 12 mouse hepatocytes. To test this hypothesis, we exposed in vitro cultures of AML 12 mouse hepatocytes to sublethal concentrations of CdCl₂ for 24 hours. Control cultures were not treated. We performed the MTT assay to assess cell viability. Data obtained from MTT experiments indicated a strong dose-dependent relationship with respect to Cd-toxicity. Upon 24 hours of exposure, Cd-toxicity was computed to be 53%, 33%, 20%, 17%, and 8% at 1.95 µg/Cd mL, 3.91 µg/Cd mL, 7.81 µg/Cd mL, 31.2 µg/Cd mL, and 62.5 µg/Cd mL, respectively. Results from our experiments show that Cd is acutely toxic to AML 12 mouse hepatocytes, in vitro.

Keywords: cadmium, cytotoxicity, MTT assay, mouse hepatocytes

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