

IN VITRO TOXIC EFFECT OF THE HERBICIDE 2,4-D ON THE RENAL-DERIVED CELL LINE HEK293

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INTRODUCTION: The herbicide 2,4-Dichlorophenoxyacetic Acid (2,4-D) is one of the most widely used agrochemicals, present in over 600 commercial products available on the market. Due to its low cost, 2,4-D is employed for selective weed control in agriculture. Adverse biological effects on human and animal health, such as immunotoxicity, teratogenesis, and endocrine disruption, have been previously reported (REF). **OBJECTIVE:** This study aimed to evaluate the in vitro toxic effects of 2,4-D using a renal-derived cell line (HEK293). **MATERIALS AND METHODS:** HEK293 cells were seeded in 96-well plates and exposed for 24 and 48 hours to varying concentrations of 2,4-D (0.1, 1, 10, 100, 500, and 1000 µg/mL). Cell viability was assessed via the MTT (Thiazolyl Blue Tetrazolium Bromide) metabolic activity assay. **RESULTS:** Exposure to 2,4-D for 24 hours at concentrations ranging from 0.1 to 500 µg/mL induced cell death rates below 30%, whereas 1000 µg/mL caused over 50% cell death. Prolonged exposure (48 hours) to 0.1–1 µg/mL resulted in low cell death (~30%), while 10–100 µg/mL led to moderate cell death (~40%). Concentrations of 500–1000 µg/mL exhibited the highest toxicity (70% and 85%, respectively). **CONCLUSION:** Our findings demonstrate 2,4-D-induced toxicity in HEK293 cells, with concentration- and time-dependent effects.

Keywords: 2,4-D; HEK293; cytotoxicity.