

## ***In vitro* Cytotoxicity Assessment of Glyphosate on the Vero Cell Line**

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### **Abstract**

Glyphosate, a widely used broad-spectrum herbicide in agricultural practices, has been a subject of ongoing debate regarding its potential adverse effects on human health. This research aimed to investigate the cytotoxicity effect of glyphosate on the Vero cell line, a common continuous mammalian cell line utilized for toxicological studies. Vero cells were exposed to varying concentrations of glyphosate, spanning environmentally relevant levels to higher doses [0.1 ppm, 0.2 ppm, 0.3 ppm, 0.4 ppm, 0.5 ppm, 0.6 ppm, 0.7 ppm, 0.8 ppm, 3 ppm]. Cytotoxicity assessment was done using MTT and SRB cell viability assays, along with morphological analysis via phase contrast and fluorescence microscopy. Preliminary findings revealed a compelling dose-dependent cytotoxic effect of glyphosate on Vero cells ( $p < 0.05$ ). Notably, higher glyphosate concentrations demonstrated a significant increase in the percentage of cell mortality. Moreover, morphological alterations such as loss of confluency, and varied fluorescence patterns were observed, suggesting the increasing occurrence of apoptosis with increasing concentration levels of glyphosate. These results contribute and conclude valuable insights into the potential cytotoxic effects of glyphosate on mammalian renal cells. The dose-dependent nature of this cytotoxicity highlights the importance of meticulous assessment of exposure levels to determine potential risks associated with glyphosate exposure. As glyphosate remains a crucial component in modern agricultural practices, understanding its impact on human health is of paramount importance. Further investigations into the underlying molecular mechanisms of glyphosate-induced cytotoxicity would enhance our understanding of its toxicological profile.

**Keywords:** *MTT, SRB, Cytotoxicity, Apoptosis, IC<sub>50</sub>*