

Glyphosate as a modulator of thyroid hormone receptor

Reis, L.T.C.¹; Lima C², S; El-Bachá S, R²; Cunha-Lima¹, S

¹, Laboratório de Bioprospecção e Biotecnologia (LaBBiotec), Instituto de Biologia, Universidade Federal da Bahia ², Laboratório de Neuroquímica e Biologia Celular (LaBNq) Instituto de Ciências da Saúde, Universidade Federal da Bahia, Bahia, Brazil.

Introduction: Endocrine disruptors are exogenous environmental molecules that can affect the synthesis, secretion, transport, metabolism, binding action, and catabolism of hormones, exerting their effect even in small amounts. Several products commonly used in Brazil and abroad fit into this category. These include the agrotoxic glyphosate. The use of glyphosate can lead to reproductive disorders, besides the possibility of leaving residues of these substances in the blood, meat, milk, urine and feces of livestock, leading to recontamination of the ground and reaching up for human consumption. The thyroid hormone receptor (TR) is part of the large family of nuclear receptors, which are transcription factors that control gene activity and target genes, associated with several metabolic functions, mainly to the hypothalamus-thyroid axis. The transcriptional activity of the TR may be positively or negatively modulated in accordance with their endogenous ligands: triiodothyronine (T3) or thyroxine (T4), cofactors as also exogenous molecules. **Objectives:** The aim of this study was to investigate whether glyphosate affect gene regulation by thyroid hormone receptor activity. **Material and Methods:** To verify the performance of TR with glyphosate, first the toxicity of this compound was tested in HeLa and HEK cells using the MTT viability test. After obtaining the IC₅₀, it was evaluated the action of glyphosate in the thyroid hormone receptor, by luciferase assay, through transfection of the thyroid hormone receptor and PGK1 plasmid. **Results and Discussion:** Results indicate acute toxicity at concentrations less than 100 parts per million of glyphosate according to *in vitro* assays with human cells. In addition to that, transfection assays show possible interaction of thyroid receptor by glyphosate. **Conclusions:** These preliminary results indicate that glyphosate is a potential endocrine disrupter acting directly via the thyroid hormone receptor.

keywords: thyroid hormone receptor (TR), endocrine disruptors (ED), transfection assay, gene regulation.

Sponsorship: CAPES