Evaluation of *Chenopodium quinoa* Lectin Neurotoxicity

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INTRODUCTION: A large number of lectins are known to be neurotoxic, mainly through its binding and inactivation of ribosomes, which causes protein elongation disruption and sequential cell death. This toxicity is the reason for the avoidance of lectins as therapeutic approaches. **OBJECTIVES:** Evaluating the neurotoxicity of the lectin from *Chenopodium quinoa* seeds (CqLec) against HEK and cortical neurons as well as measuring its acute and chronic effects in calcium transient levels in hippocampal neurons. **MATERIAL AND METHODS:** HEK293 cells were plated in a 96-well plate(300,000cells/well) and incubated for 18h using different CqLec concentration, washed and analyzed with AlamarBlue kit to determine cell viability. Rat cortical neurons were plated in a 96-well plate(200,000cells/well). Cells underwent 18h incubation with different CqLec concentrations, washed and analyzed with AlamarBlue kit. For acute and chronic calcium transient measurements, mouse hippocampal neurons were platted and kept in culture for 7days. After that, neurons were treated with CqLec and treated with the calcium probe Flou-4. The CqLec treatment was of 0h for acute and 24h for chronic conditions. Neurons were analyzed in a microscope. **RESULTS AND DISCUSSION**: CqLec showed no toxicity for HEK cells, however, for cortical neurons, concentrations of 10;25;50;100 and 500µg/mL presented high levels of toxicity whilst 2.5 and 5µg/mL displayed insignificant levels. When calcium transients in hippocampal neurons were analyzed, it was observed that CqLec is responsible for a neuron excitability increment at 1µg/mL (acute model), which may cause viability reduction observed for higher concentrations of CqLec. In the chronic model, instead, the calcium transient levels are diminished in CqLec presence in all tested concentration. **CONCLUSION:** CqLec demonstrated no toxicity for HEK cells and low toxicity for cortical neurons in low concentrations. In acute model, CqLec contributed for an increment of the neurons excitability at 1µg/mL, allowing the neurons to connect and inducing synaptic transmission, but in chronic model, CqLec affect negatively on hippocampal neurons connectivity.

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