F.69 - Cytotoxic Effects of Chitosan Nanoparticles Containing S-Nitrosoglutathione in Triple-Negative Breast Cancer Cells

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INTRODUCTION: Breast cancer is the most common type of cancer affecting women worldwide. Among the treatments, radiation therapy (RT) is frequently chosen as a primary strategy; however, it demands high doses of ionizing radiation to achieve a curative dose. To enhance RT effectiveness, an external agent can be used to sensitize cells before the treatment, allowing a dose reduction. Nitric oxide (NO) is an essential molecule linked to several organic processes, besides being described as a potential radiosensitizer of tumor cells by different mechanisms, including oxidative stress. However, NO have a short half-life in biological conditions, making it difficult to achieve anticancer effects. To overcome this, NO donors can be encapsulated into polymer-based nanoparticles, ensuring a sustained NO releasing. OBJECTIVES: To evaluate the cytotoxicity induced by chitosan nanoparticles containing S-nitrosoglutathione (GSNO-CS NPs) in 4T1 cells (murine triple-negative breast cancer). MATERIALS AND METHODS: Cells were cultivated, seeded in 96-well plates (2 x 10^4 cells/well), and incubated at 37ºC with 5% of CO_2 for 24 h. Both CS NPs and CS NPs containing GSNO encapsulated were added to the plates at different concentrations (0-2.4 mg/ml CS NPs, 0-6 mM GSNO) and incubated for 24 h. Cytotoxic effects were evaluated through Resazurin fluorometric assay in both groups. DISCUSSION AND RESULTS: Our results showed a 65% reduction in cell viability for GSNO-CS NPs groups treated at 6 mM, while only 30% of cells were killed when treated by CS NPs group. CONCLUSION: Our data suggest that GSNO-CS NPs were able to promote cytotoxicity effects, thus inducing oxidative stress in triple-negative breast cancer cells. Next steps involve the use of these nanoparticles before RT to evaluate its radiosensitizer effect.

Keywords: 4T1 cells, nitric oxide, radiosensitization
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F.70 - Potential of Trichoderma spp. for the Promotion of Plant Growth and Biological Control of Soybean Phytopathogens

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INTRODUCTION: The use of *Trichoderma* for the biological control of soybean diseases such as charcoal root rot (*Macrophomina phaseolina*) and white mold (*Sclerotinia sclerotiorum*) is the most sustainable alternative when compared to the use of pesticides. These fungi produce enzymes that degrade the cell wall of phytopathogens, promote plant growth through the production of phytohormones, such as indole-3-acetic acid (IAA), and phosphorus solubilization. OBJECTIVES: To evaluate the potential of two strains of *Trichoderma* sp. (T15 and T24) as biological control agents of *M. phaseolina* and *S. sclerotiorum*, and the characteristics for promoting plant growth. MATERIALS AND METHODS: The antagonistic activity was determined by dual culture technique for 7 days. The production of IAA was determined in liquid medium at 30 °C, recovered aliquots every 24h for 7 days. The solubilization of phosphorus was performed in a liquid medium at 30°C after 7 days. *Trichoderma* isolates (15 and T24) were inoculated in *Trichoderma* Liquid Enzyme medium (TLE) containing 0.5% of the cell wall of the phytopathogens (*M. phaseolina* and S. sclerotiorum) and the enzymes NAGase, phosphatase, protease, β-1,3-glucanase, β-glucosidase and chitinase were evaluated in the period of 24h, 96h and 144h. DISCUSSION AND RESULTS: The fungi *Trichoderma* sp. (T15 e T24) showed inhibition against the phytopathogens *M. phaseolina* e *S. sclerotiorum*. *Trichoderma* sp. (T24) obtained higher IAA production (74.21 µg mL^{-1}) and phosphorus solubilization (263.9 µg mL^{-1}) after 72 h and 168 h, respectively. In the presence of cell wall of *S. sclerotiorum*, *Trichoderma* sp. T24 produced NAGase (12,5 U/mL) and protease (12,6 U/mL) in 144h, and *Trichoderma* sp T15 produced phosphatase (2,44 U/mL) and β-1,3 glucanase (10,5 U/mL) in 48 hours. Both strains did not produce β-glucosidase and chitinase. CONCLUSION: The *Trichoderma* sp (T15 and T24) demonstrated biotechnological potential by producing compounds and enzymes that help plant growth and the biocontrol of phytopathogenic fungi.

Keywords: Trichoderma, phytopathogenic fungus, biological control / **Supported by:** CNPq