Cytotoxic and bactericidal activities of silver nanoparticles synthesized with sulfated fucan-rich fraction from the brown seaweed *Spatoglossum schröederi*

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**INTRODUCTION:** Nanoparticles containing silver have many applications, among they highlight their antiproliferative potential. In recent years, an increasing number of marine natural products from several sources have been reported to display several activities. Among these compounds, sulfated polysaccharides (SP) extracted from seaweeds occupy a special place because they exhibit a wide range of activities, like the fucans from the seaweed *Spatoglossum schroederi*. These fucans showed antioxidant, antiangiogenic and antitumor activities.

**OBJECTIVES:** The aim of this study was to synthesize silver nanoparticles using fucan-rich fraction from *S. schröederi* and evaluated their cytotoxic activity against melanoma cells and antibacterial activity. **MATERIALS AND METHODS:** The SP from *S. schröederi* were extracted by proteolytic digestion and acetone fractionation. The most abundant fraction (F0.5v) was used to synthesize silver nanoparticles during four different times (1; 4; 12; and 24 h). The diameter and the surface charge of the particles were characterized by DLS (Dynamic Light Scattering). In addition, the nanoparticles were subjected to MTT cytotoxic assay with B16F10 melanoma cell line. These nanoparticles also were used in a Minimum Inhibitory Concentration test with the bacterial strains *Staphylococcus aureus* ATTC 25923 and *Escherichia coli* ATCC 25922.

**DISCUSSION AND RESULTS:** The nanoparticles average diameters obtained were 1h (196 ± 13 nm); 4h (186 ± 10 nm); 12h (156 ± 10 nm); and 24 h (230 ± 15 nm). The zeta potential showed negative charge of all tested samples. All nanoparticles showed cytotoxic effect ranged from 40% to 80%. In addition, they were more potent toxic agents than F0.5v. The minimum inhibitory concentrations obtained for the two strains was 100 μg/mL for the tested nanoparticles in contrast to F0.5v that did not show inhibition.

**CONCLUSIONS:** The silver nanoparticles potentiated the cytotoxic and bactericidal effect of F0.5v fucan-rich fraction. Further studies showed whether other fucan properties were also positively affected by nanoparticles.

**Keywords:** B16F10, Melanoma, Sulfated fucan.

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