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CELL VIABILITY OF *Arrabidaea chica* NANOPARTICLES

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Purpose of study: *Arrabidaea chica* (Humb. & Bonpl.) Verlot is a native tropical American vine with healing properties. Applying nanotechnology to plant extracts has revealed an advantageous strategy for herbal drugs considering the numerous features that nanostructured systems offer, including solubility and bioavailability. The present study reports the cell viability of chitosan-sodium tripolyphosphate nanoparticles charged with *A. chica* extract.

Methods: *A. chica* leaves were collected at CPQBA-Unicamp experimental field (voucher specimen 1348; CGEN 010150/2012-9). A hydroalcoholic standardized extract (AcE) was obtained by extracting the dried ground leaves with acidified 70% hydroethanol solution (0.3% citric acid), 3 times during 2h periods. Nanoparticles were formed by adding sodium tripolyphosphate (TPP) solution drop wise onto a chitosan (CS) solution under mechanical stirring (ionic gelation method). The extract (AcE) was incorporated into TPP solution prior to nanoparticle formation. Cell viability was assessed by a 3-(4,5-dimethylthiazol-2-yl)-2,5 diphenyltetrazolium bromide (MTT) assay.[1] To evaluate the possibility of cytotoxic products production, the samples were set up in 5 mL of FBS-free supplemented DMEM and placed on a shaker at 37 °C. The conditioned medium was collected and filtered at days 1, 2, 3, 7, 10, 15, 21; and stored at -20 °C until required. Biocompatibility was evaluated using human skin fibroblasts.

Results: Our studies indicated that CS /TPP polymer ratio (w:w) of 5, CS/TPP volume ratio of 10 and using mechanical stirring at 7200 rpm, followed by sonication (5 min, 20% amplitude) resulted in the reproducible formation of nanoparticles with an average hydrodynamic diameter of 150 ± 13 nm and zeta potential of +45 ± 2 mV, with high yields (75%). Particle size decreased with AcE addition (60 ± 10 nm), suggesting an interaction between extract's composition and polymers. Evidence for the encapsulation of AcE was provided by Fourier Transform Infrared (FTIR) spectroscopy. Cell viability was approximately or higher than 80% in all cases, according to assessment of the standard ISO 10993-5:2009 biocompatibility was not compromised. Thus, under the experimental conditions, the samples did not produce cytotoxic products.

Conclusions: The CS-TPP nanoparticles loaded with *A. chica* standardized extract were successfully prepared based on the ionic gelation between chitosan and TPP. The *A. chica* nanoparticles showed good biocompatibility demonstrated in cell viability study. The AcE encapsulation offers an approach for further application of *A. chica* extract.

References:

[1] Mosmann T. 1983. Rapid colorimetric assay for cellular growth and survival: application to proliferation and cytotoxicity assays. J Immunol Methods. 65:55-63.