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SYNTHESIS OF GOLD NANOPARTICLES USING MELALEUCA EXTRACT

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Nanotechnology is a broad area of constant growth in today's society. The properties of matter on a nanometric scale, in relation to conventional ones, have been driving advances in the field of research and innovation. *Callistemon viminallis* is a plant belonging to the Myrtaceae family, which has several properties, including antioxidant, antimicrobial, anti-inflammatory action, among others. In this context, the use of plant extracts for the synthesis of gold nanoparticles (AuNPs) provides advances in nanotechnology, since it uses more sustainable methodologies for synthesis. This approach replaces chemical compounds with natural extracts, making the process less aggressive to the environment. In addition to eliminating toxic agents, plant extracts confer therapeutic properties to nanoparticles, due to their rich phytochemical composition. [1] The removal of Melaleuca was done by maceration using a reflux system, weighing 10 g of dry and pulverized plant material and then adding 100 mL of water, with the previously ready solution, it was added over heating until it reached boiling and kept for 40 minutes at reflux. After this time elapsed, the solution was subjected to centrifugation for 5 minutes at 1.600 rpm, the supernatant was filtered. After the extract was ready, it was stored in a freezer -80 ºC and lyophilized until the solvent was completely removed. The synthesis of AuNPs was carried out based on the methodology of ELIAS et al., 2024, first the gold solution was prepared using a stock solution (0.1 mol/L) and from it diluted to a concentration of 1mM. Afterwards, a solution with the 10mg/mL extract was prepared and filtered through a 0.22 µm nylon membrane. After the prepared solutions were received, the extract was added to the gold and stirred for 10 minutes, inspiring a change in color. It was then centrifuged at 5.000 rpm for 10 minutes and stored at 4°.[3] The methodology is demonstrated and researched in gold nanospheres with an absorption peak of approximately 520 nm. The project is still in progress, along with test results, such as for example an antioxidant using DPPH.

Keywords: *Nanoparticulas, Melaleuca, Nanoesferas, sintese verde, extrato vegetal.*

[1] LIU, Yun; DENG, Jie; HUANG, Hao; et al. A novel wound dressing based on a gold nanoparticle self-assembled hydrogel. *Materials Today Bio*, v. 22, 100817, 2024.
[2] ELIAS, Nurul Ashikin et al. Antibacterial properties of synthesized Melaleuca cajuputi-leaf gold nanoparticles. *Materials Letters*, v. 366, p. 136565, 2024.