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OBTAINING OF CVD NANODIAMONDS AND CYTOTOXICITY IN B16 CELLS FOR THE APPLICATION IN METASTATIC MELANOMA THERAPY

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Diamond nanoparticles, (NDs), have been studied as nanostructures suitable for spatial and biomedical applications. NDs are inert, optically transparent, photoluminescent, biocompatible and can also be functionalized in many ways depending on their final application [1, 2]. The National Cancer Institute (Inca) estimated approximately 165.580 cases of skin cancer in Brazil in its latest report (2018). Estimates reveal that the impact of neoplasms will increase dramatically in coming decades. Thus, the objective of this study will be to develop nanoparticles from laser ablation and with antitumor activity. NPs act as transporters and drug-releasing agents, protecting drugs from interference of the external environment to reach their target treatment in its active form. The present study proposes the development of photosensitizing nanoparticles (FTs) based on NDs for the application in metastatic melanoma therapy. The results showed that the laser ablation process reduced CVD particle size. The mean hydrodynamic diameter in aqueous suspension after the centrifugation changed from 54 nm. The high stability of aqueous suspension of CVD NDs was indicated by the low polidispersity index (0,2) and a small increase in the mean value of hydrodynamic diameter during the observed period (D = 215 nm). The high stability was provided by the high charge density on NDs surface as suggested by the high value of Zeta-potential (-36.39 and -30.94 mV). The cytotoxic activity will showed 60% and 80% of cell viability against the murino metastatic melanoma B16-F10 cell after 24h and 48h, of incubation with NDs. Later the NDs will be activated with photoactive molecules and tumor-homing peptides. The high value of cell viability is an indicative of the cytocompatibility of NDs, indicating the potential use of NDs in biomedical applications such as drug delivery platforms.