Isolation and characterization of circulating exosomes from blood in brain tumors

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Abstract:

Extracellular vesicles (EVs) are crucial in mediating intercellular communication in physiological and pathological conditions. Accordingly, tumor-secreted EVs play an important role in regulating tumor malignancy. Tumor-derived EVs contain proteins, mRNAs, and miRNAs, which can be delivered between different types of cells and even transferred to distant locations to influence the biological activities of tumors, such as proliferation, invasion and metastasis. Clinically, tumor-derived EVs may represent a target for therapeutic intervention and for the development of early diagnostic biomarkers.

The purpose of our study is provide evidences on the roles of EVs in brain cancer, focusing on the importance of exosomal Hsp as therapeutic targets and biomarkers for early cancer detection.

We have focused on the isolation, morphological analyses, determinations of particle concentration, stability purity of EVs isolated from blood samples obtained from patients with brain cancer before and after ablative surgery. Blood samples were collected after one week, after one month, and after three months of surgery. EVs were isolated from plasma (1 mL) by Size exclusion chromatography (SEC), and fractions analysed by Nanoparticle Tracking Analysis (NTA), and Transmission Electron Microscopy (TEM). Besides, mass spectrometry (MS) is being used to study their proteomic profile.