IVD.18 - Identification of aptamers for application in the differential diagnosis of ovarian tumor

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Introduction: Cancer is an important cause of worldwide mortality, killing more than 8 million people every year. The ovarian cancer is one of seven cancer types than most affect womem, and is considered the most fatal among the gynecologic tumors. The ovarian tumor detection presents importants limitations and is highlighted as the most difficult gynecological tumor to be diagosed, hidering the efficiency of the treatment and consequently patients' survival. Specific molecules produced by tumors could be used as biomarkers and are considered good targets for diagnosis. Thus, the use of aptamers represents an important tool to be applied for the improvement of the specificity in tumor diagnosis. Aptamers are small synthetic nucleic acid sequences, which bind with high specificity to a molecular target, presenting interesting pharmacokinetic stabillity, bioavailability and permanence in blood circulation, and moreover are able to bioconjugation with nanoparticles, imaging agents and therapeutics drugs. Bioinformatics approaches may contribute to the improvement of aptamer identification and studies focusing in target molecule-aptamer interaction. Thus, computational analyzes are being applied to aptamers study, including 3D structural modeling, *in silico* simulation for aptamers selection by molecular dynamics, modeling of virtual libraries and *in silico* aptamer optimization.

Objective: The main goal of this study is the identification of aptamers with potential use in tumor-specific diagnosis that would be able to differentiate metastatic and non-metastatic tumor with application in tissue biopsies for epithelial ovarian cancer.

Methodology: For this, the Cell-Selex methodology will be apllied for the selection of specific for each ovarian tumor type: metastatic and non-metastatic. The identification of the molecules recognized by selected aptamers will be developed by Aptabid proteomics. Further, the 3D aptamers structures and the target molecules will be modeled and the interaction of the aptamer with its target molecule will be analyzed *in silico* through molecular focusing.

Results: To date, we are doing the round 7 of Cell-Selex for the selection of specific aptamers for non-metastatic cell, using caov-3 cell line, of epithelial ovarian tumor.

Conclusion: Although the use of this metodology had been already explored for other tumor types, its application in ovarian tumor is innovative, and contributes to new tecnologies in public health in Brazil. In this way, the application of this tecnology could improve the diagnosis and prevention, with a potential early detection and with great impact in life expectancy of patients with ovarian tumor.

Keywords: Ovarian cancer; Aptamers; Diagnosis