

Abstract ID: 92962

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Area of Research: Cancer

PhD Programme: DS Translational Molecular and Cellular Biosciences (TMCB)

Semester: 6

Evaluation and diagnostic potential of pituitary adenoma derived extracellular vesicles

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Pituitary adenomas account for approximately 10-15 % of CNS tumors. According to their pathophysiology, size and endocrine activity, pituitary adenomas can be divided in distinct subgroups. Hormonal inactive tumours account for about 25 % of all pituitary adenomas (NPPA). In contrast to pituitary adenomas with endocrine activity, which cause symptoms by hormonal disturbances, NPPAs are usually diagnosed by symptoms such as ophthalmoplegia or visual field deficits through mechanical compression of cranial nerves in the sella region. In contrast to pituitary adenomas with hormonal activity there is no valid blood test available for the diagnosis or follow up procedures of NPPAs. The diagnostic method of choice in NPPAs is MRI. Extracellular vesicles(EVs) are endosome-derived membrane vesicles released by different cell types including tumor cells. It is expected that EVs influence tumor growth and development through connection with the tumor microenvironment. EVs in human plasma might be a valid tumour biomarker for patients with NPPA. There is no data available about the diagnostic potential of circulating EVs from NPPAs. We present our protocol for isolation and characterization of EVs in human plasma in a series of 10 patients with NPPA using the FOLR1 and EpCAM protein expression. Blood samples were collected preoperative and three months postoperative. Tumor samples were collected during surgery in all patients for histopathological analysis. For EV characterization we used the ExoView® from NanoView Biosciences. There was no significant difference between preoperative and postoperative FOLR1 and EpCAM protein expression on EVs in human plasma. According to our data no conclusion for the diagnosis or prognosis of NPPAs can be drawn. The research field of EVs is still very young with limited protocols and techniques for the isolation and characterization. Further trials using different antibodies or membrane proteins for the detection of EVs seems reasonable.