Cancer diagnosis based on plasmonic biosensors and exosome analysis

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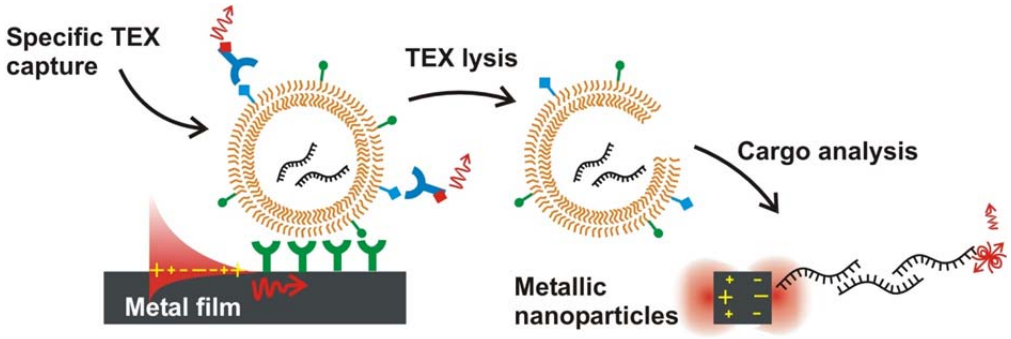

This project aims to detect tumor-derived exosomes from bodily fluids with plasmon-enhanced fluorescence spectroscopy to specifically diagnose ovarian cancer. Exosomes are small vesicles that are shed from cells in order to communicate and interact with their surroundings. These vesicles are built by a lipid bilayer that resembles the cellular membrane of its origin and cargo molecules like proteins, messenger RNAs or micro RNAs that are stored inside the lipid bilayer. As such exosomes are also secreted by tumor cells and are present in several bodily fluids they have great potential as a source of new biomarkers for cancer diagnosis, prognosis, therapy or even recurrence detection. The usage of plasmon-enhanced fluorescence makes it possible to detect lowest concentrations of molecular analytes in small sample volumes. Also this method has the capability of a multistep analysis, where several biomarkers on the surface and the inside of the exosomes can be detected at once or at least in a few consecutive steps with the same sample. The possibility of measuring biomarkers in very low concentrations and combining different biomarkers makes the plasmon-enhanced fluorescence a promising tool for specific and sensitive cancer diagnosis.