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Abstract

Modifications of the PAMONO-Sensor Help to Size and Quantify Low Number of Individual Biological and Non-Biological Nano-Particles †

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Abstract: In a series of recently published works, we demonstrated that the plasmon-assisted microscopy of nano-objects (PAMONO) technique can be successfully employed for the sizing and quantification of single viruses, virus-like particles, microvesicles and charged non-biological particles. This approach enables label-free, but specific detection of biological nano-vesicles. Hence, the sensor, which was built up utilizing plasmon-assisted microscopy, possesses relative versatility and it can be used as a platform for cell-based assays. However, one of the challenging tasks for such a sensor was the ability to reach a homogeneous illumination of the whole surface of the gold sensor slide. Moreover, in order to enable the detection of even relatively low concentrations of nano-particles, the focused image area had to be expanded. Both tasks were solved via modifications of previously described PAMONO-sensor set ups. Taken together, our latest findings can help to develop a research and diagnostic platform based on the principles of the surface plasmon resonance (SPR)-assisted microscopy of nano-objects.

Keywords: surface plasmon resonance; virus-like particles; extracellular vesicles; liquid biopsies

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