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Novel biomarker and drug delivery systems for theranostics – extracellular vesicles

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Extracellular vesicles (EVs) are nano- and micro-sized cell-derived entities, released from cells under physiological and pathological conditions [1]. EVs can be found in every biological fluid including blood, saliva, milk, or urine, serving as a liquid biopsy [2]. Their biological properties (cell-uptake, biocompatibility) [3], and chemical (composition, structure) or physical (size, density) [4] characteristics make EVs a good candidate for drug delivery systems (DDS). Recent advances in the field of EVs (e.g. scaling-up production, purification) and developments of new imaging methods (molecular imaging) revealed benefits of radiolabelled EVs in diagnostic and interventional medicine as a potential DDS in theranostics [5].

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[3] Stępień E et al. Microparticles, not only markers but also a therapeutic target in the early stage of diabetic retinopathy and vascular aging. *Expert Opin Ther Targets.* **2012**;16:677-88.
[4] Stępień EŁ et al. Fourier-Transform InfraRed (FT-IR) spectroscopy to show alterations in molecular composition of EV subpopulations from melanoma cell lines in different malignancy. *Biochem Biophys Rep.* **2021**;25:100888.
[5] Stępień EŁ, Rząca C, Moskal P. Novel biomarker and drug delivery systems for theranostics—Extracellular vesicles. *Bio-Algorithms Med-Systems* **2021**:17:301–309

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