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Exosomes from human ovarian carcinoma SKOV3 cells are enriched in glycosylated proteins

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Exosomes are small vesicles released by various cell types, including tumor cells, as a result of fusion of the multivesicular bodies with the plasma membrane. Exosomes can interact with target cells and mediate different processes, such as, tumor progression and intercellular transfer of proteins and RNA.

Although heavily glycosylated forms of some proteins were found in exosomes, the role of glycosylation on protein sorting to exosomes and on the recognition and uptake of these vesicles by cells is still not known.

The analysis of the glycosylation profiles of cellular extracts and exosomes from ovarian carcinoma SKOV3 cells, using lectins with different specificities, showed higher levels of protein glycosylation, in particular, sialylation in exosomes.

SKOV3 cells were found to internalize SKOV3 derived exosomes, labeled with carboxyfluoresceine diacetate succinimidyl-ester (Exos-CFSE), through an energy-dependent process that was almost completely inhibited at 4 ºC. Digestion of Exos-CFSE and SKOV3 cells with proteinase K resulted in considerably lower levels of uptake indicating that proteins were required, at least in part, for internalization. Exos-CFSE uptake was slightly increased after exosomes desialylation with neuraminidase and blocking of cell surface glycan-receptors with different monosaccharides had no effect when compared with the control D-glucose.

In conclusion, the increase in protein glycosylation was not essential for exosomes recognition and uptake by target cells. The presence of some heavily glycosylated proteins in exosomes might be a consequence of their enrichment in specific domains of the plasma membrane from where exosomes emerge.

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