Role of αvβ3 integrin in extracellular vesicle uptake by tumor cells

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Video Byte

Keywords: small extracellular vesicles, αvβ3 integrin, adhesion, uptake, breast cancer, EVs, extracellular vesicles, extracellular matrix, cancer, tumor, Cell Communication and Signaling

Posted Date: November 12th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-106639/v1

Abstract

Cancer cells interact with neighboring cells through proteins in the extracellular matrix (ECM), a scaffold of molecules that support cells and tumor development. As part of this process, cancer cells release extracellular vesicles that participate in tumor progression, either interacting with ECM or tumor surrounding cells, allowing tumor cells to develop, metastasize, and become drug-resistant. Adhesion receptors called integrins are found in extracellular vesicles (EVs) from tumor cells. These receptors are responsible for the interaction of tumor cells/EVs with the ECM. EVs – nanovesicles secreted from cells and packed with bioactive cargo can mediate communication between cells. EVs are classified according their size, biogenesis mechanism and cargoes (SEVs: size 50–150 nm, LEVs: size 100–1000 nm). Integrins in EVs have been shown to promote cancer cell migration and metastasis, although how this happens is unclear. It has been shown that αvβ3 integrin is expressed in human breast cancer cell lines. The researchers found that EVs secreted from breast cancer cells carry αvβ3 integrin that supports EVs binding to ECM components and cells allowing SEVs to support cell attachment in the same manner that the integrin substrate fibronectin in coated dishes. Blocking αvβ3 integrin binding inhibited binding to both fibronectin- and EV-coated dishes and inhibited EV transfer from breast cancer cells to healthy breast cells. These results suggest a new role for αvβ3 integrin in cell-cell communication, mediated through EVs rather than at the cell surface and provide a new promising target for cancer research.