Anoikis

Anoikis is a form of programmed cell death that occurs in anchorage-dependent cells when they detach from the surrounding extracellular matrix (ECM).

Usually cells stay close to the tissue to which they belong since the communication between proximal cells as well as between cells and ECM provide essential signals for growth or survival. When cells are detached from the ECM, there is a loss of normal cell-matrix interactions, and they may undergo anoikis. However, metastatic tumor cells may escape from anoikis and invade other organs.

Anoikis resistance is a crucial step in the process of tumor metastasis. This step determines whether the tumor cells will survive when they become detached from the extracellular matrix. However, the specific mechanism of tumor cells to bypass anoikis and become resistant remains to be elucidated. The present study aimed to determine the internal mechanism of bypassing anoikis through comparison of human osteosarcoma cell lines with human normal cell lines. High activating transcription factor 4 (ATF4) and myelocytomatosis oncogene (MYC) expression levels were observed in MG-63 and U-2 OS human osteosarcoma cell lines. It is possible that ATF4 and MYC contribute to tumor progression. Subsequently, the expression levels of ATF4 and MYC in HUVEC and CHON-001 human normal cell lines were upregulated and their adhesion abilities were reduced; whereas their ability to bypass anoikis increased significantly. Simultaneously, after we Following a knock-down of ATF4 and MYC expression levels in MG-63 and U-2 OS human osteosarcoma cell lines, their adhesion ability increased and their ability to bypassing anoikis was significantly reduced. Upregulation of MYC resulted in an upregulation of ATF4, and chromatin immunoprecipitation and luciferase reporter gene technology demonstrated that MYC binds to the promoter of ATF4. These findings suggest that ATF4 regulated by MYC might contribute to resistance to anoikis in human osteosarcoma cells¹⁾.

1)

Mo H, Guan J, Mo L, He J, Wu Z, Lin X, Liu B, Yuan Z. ATF4 regulated by MYC has an important function in anoikis resistance in human osteosarcoma cells. Mol Med Rep. 2017 Dec 18. doi: 10.3892/mmr.2017.8296. [Epub ahead of print] PubMed PMID: 29257326.

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