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Interleukin-١ beta and tumor necrosis factor-alpha increase ABCG٢ expression in MCF-٧ breast carcinoma cell line and its mitoxantrone-resistant derivative, MCF-٧/MX

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Abstract

Objective: In this study, we aimed to evaluate the influence of proinflammatory cytokines on ABCG٢ expression and function in human MCF-٧ breast cancer cell line and its mitoxantrone-resistant derivative MCF-٧/MX. Methods: The effects of proinflammatory cytokines on ABCG٢ mRNA expression were studied using real-time PCR method. Cytokine-mediated modification of ABCG٢ protein expression and function was investigated by means of flow cytometry. Results: Significant inductions in the ABCG٢ mRNA levels, protein expression, and activity were observed in IL-١β and TNF-α-treated MCF-٧ cells. IL-٦ increased ABCG٢ protein, but had no effects on ABCG٢ mRNA and function in MCF-٧ cells. Although IL-١β did not alter mRNA and protein levels of the transporter in MCF-٧/MX cells, ABCG٢-mediated efflux was significantly increased in IL-١β-treated MCF-٧/MX cells. TNF-α-treated MCF-٧/MX cells also demonstrated greater ABCG٢ protein expression and function without any changes in mRNA levels of the transporter. Neither ABCG٢ mRNA nor its protein expression and function were affected by IL-٦ in MCF-٧/MX cells. Conclusion: IL-١β and TNF-α induce ABCG٢ mRNA and protein expression and increase its activity in breast cancer cell line MCF-٧. In MCF-٧/MX cells these cytokines modulate ABCG٢ protein expression and/or function, but they have no influence on the transporter mRNA levels. © ٢٠٠٩ Birkhäuser Verlag, Basel/Switzerland.

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ABCG٢; Breast cancer; Gene regulation; Multidrug resistance; Proinflammatory cytokines

Indexed Keywords

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EMTREE medical terms: article; breast carcinoma; cancer cell culture; cell strain MCF ٧; controlled study; flow cytometry; human; human cell; protein expression; protein function; real time polymerase chain reaction

MeSH: Adenocarcinoma; Antineoplastic Agents; ATP-Binding Cassette Transporters; Breast Neoplasms; Cell Line, Tumor; Drug Resistance, Neoplasm; Gene Expression Regulation, Neoplastic; Humans; Interleukin-١beta; Interleukin-٦; Mitoxantrone; Neoplasm Proteins; RNA, Messenger; Tumor Necrosis Factor-alpha

Medline is the source for the MeSH terms of this document.

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