A Gene Encoding a Human Reduced Folate Carrier (RFC) and Methods for the Treatment of Methotrexate-Resistant, Transport-Deficient Cancer Cells

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Technology description

Summary

Methotrexate (MTX), a folate agonist that inhibits the cellular enzyme dihydrofolate reductase, is effective for the treatment of several types of cancer including non-Hodgkin's lymphoma, childhood acute lymphoblastic leukemia, osteosarcoma, and breast cancer. A major drawback of MTX therapy, however, is that previously responsible tumor cells may become resistant to MTX after continued exposure. Increased expression of the reduced folate carrier (RFC) protein can restore sensitivity to MTX. This invention embodies methods to treat various forms of cancer that have become resistant to MTX by increasing expression of RFC protein in tumor cells via gene therapy, thereby restoring MTX sensitivity. Methods for determining the level of RFC expression, employing antibodies or specific nucleic acid probes, are also described.

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