Antibody for targeting cancers characterized by increased iron uptake

Iron is one of the key nutrients necessary for cell division. Increased cell proliferation, a hallmark of many cancers, is in part due to increased iron uptake by the cell. One characteristic of the diseased cells is the overexpression of the transferrin receptor protein (TfR1, also known as Cluster of Differentiation 71, or CD71), which is responsible for transporting iron across the cell membrane. This technology is an antibody to TfR1. It can be used to detect cells that express TfR1 and can be adapted for use in therapies that treat cancer as well as nutrient deficiencies.

Transferrin receptor antibody can detect cancer cells and potentially halt cell division

Cancer cells can be selectively targeted by taking advantage of their increased rate of cell division. TfR1 is a membrane protein found in a diverse range of cell types, and it is responsible for carrying transferrin, an iron-binding glycoprotein, into the cell. When the receptor is overexpressed, the cell takes in more transferrin, and cell division is stimulated. This pathway has been implicated in cancers including leukemia, lymphoma, multiple myeloma, and in breast, colorectal, and liver carcinomas. Immunotherapies that target TfR1 can potentially halt cell division in these cancers. This TfR1 antibody has a number of potential research and clinical applications. It can be used as a diagnostic tool for identifying cancerous cells, and can potentially be used to separate them from healthy cells for further testing. It has the potential for use as a treatment, if modified with chemotherapy drugs. Recent studies with related TfR1 antibodies have shown that they have potential in treating cancers like Adult T Cell Leukemia and Mantle Cell Lymphoma for which there are no other treatments. Finally, this technology could be adapted as a therapy for iron deficiency in pregnant women or to deliver growth or protective factors in patients with neurodegenerative diseases like Alzheimer’s and Parkinson’s.

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Applications:

- Cancer immunophenotyping
- In vitro sorting (e.g. using flow cytometry) of cells with TfR1 overexpression from healthy cells
- Treatment of cancers characterized by TfR1 overexpression
- Iron replacement in pregnant women
- Treatment for neurodegenerative diseases like Alzheimer’s and Parkinson’s

**Advantages:**

- Relevant to orphan diseases like Adult T Cell Leukemia and Mantle Cell Lymphoma
- Specifically targets cancer cells over healthy cells

Tech Ventures Reference: IR CU14351

**Patent Information:**
Patent Pending

**Related Publications:**


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