Method of Treating Cancer with Antibodies Against Glucose Transporter-1

Aggressive and advanced breast and lung cancers currently represent a large number of US cancer cases and a significant proportion of all cancer related deaths. New treatments targeting novel cancer proteins are necessary to treat this diverse set of patients who are underserved by current therapies. Our technology has the potential to be a first-in-class targeted antibody therapy against the glucose transporter-1 (GLUT1) protein in breast and lung cancers. Mouse studies of our antibody have shown promising safety and efficacy profiles and synergism with available chemotherapeutics.

COMMERCIAL OPPORTUNITY

- Elevated levels of GLUT1 have been observed over 40% of breast cancers and 49% of lung cancers. Highly aggressive and fast growing triple-negative breast cancers account for about 20% of the >200,000 total US breast cancer cases diagnosed each year. Because these patients have no targeted treatment options and poor prognosis, this number also correlates with the annual breast cancer mortality rate (>40,000).

- Our method of using antibody therapy against the glucose transporter-1 (GLUT1) protein is intended to deprive aggressive and rapidly growing cancer cells of the quick energy source (glucose) they need to grow, thereby targeting more types of cancers effectively.

- We have mouse xenograft data using a triple-negative breast cancer cell line that shows reduced tumor growth, increased survival, and decreased metastasis associated with anti-GLUT1 antibody therapy as a single agent or in combination with tamoxifen or cisplatin.

- Antibody therapies have been approved for very specific indications in both lung (cetuximab) and breast (trastuzumab) cancer patients, illustrating their potential efficacy in these solid tumors, albeit for limited subpopulations of patients.

TECHNOLOGY

Using a monoclonal antibody against the glucose transporter-1, our mouse studies showed no organ or central nervous system damage with relatively high intravenous antibody doses of up to 20mg/kg. Using MDA-MB-231 breast cancer cells in a xenograft mouse model of aggressive breast cancer, doses between 5-10mg/kg reduced tumor volume from a median size of 475 mm³ to 325 mm³, as well as increased PARP cleavage and increased ACC phosphorylation—biomarkers of apoptosis and energy starvation, respectively. Breast cancer studies in nude mice have shown that in combination with Tamoxifen there was a dramatic increase in longevity, with several mice in the study living at least 15 days beyond the 30-day period of the study. Additionally, in combination with Cisplatin the data trend suggests a decrease in metastases.

PUBLICATION/PATENT

- US Nationalized PCT application filed for Dr. George Simon on 08/15/2008

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LICENSING OPPORTUNITY