Glucose Transporter Inhibitors (GLUT1 Inhibitors)

A potential cancer treatment that suppresses the ability for cancer cells to intake glucose, thereby hampering cancer cell production.

The Need

A fundamental property of neoplastic cells is the shift in cellular metabolism from oxidative phosphorylation to aerobic glycolysis. This glycolytic shift, called the Warburg effect, enables cancer cells to adapt to low-oxygen microenvironments, to generate biosynthetic building blocks for cell proliferation, to acidify the local environment, to facilitate tumor invasion, and to generate NADPH and glutathione through the pentose phosphate shunt to increase resistance to oxidative stress. Thus, the targeting of glucose metabolism is considered an attractive therapeutic approach for cancer.

The Technology

The Ohio State University researchers, led by Dr. Ching-Shih Chen, developed and synthesized a novel class of anticancer agents that suppress the ability of cancer cells to utilize glucose, resulting in cellular death in the cancer cells. These agents take advantage of the differences between glucose uptake rate in non-malignant and malignant cancer cells. The agents exhibited anticancer activity against androgen-insensitive prostate cancer cells, breast cancer cells, and pancreatic cancer cells. Currently, this class of glucose transporter inhibitors is in early preclinical evaluations with initial in vivo evaluations of tumor-suppressive activities in human xenograft tumor models beginning.

Commercial Applications

- Cancer therapeutics

Benefits/Advantages

- Does not exhibit cytotoxicity in non-malignant cells
- Suppresses glucose uptake in cancerous cells
- Influences apoptotic activity in malignant cells
- The IC-50 of the lead compound (30) has been found to be 4 uM

Tech ID

T2012-145

College

College of Pharmacy

Licensing Manager

Paschall, Christopher
paschall.12@osu.edu
614-688-2727

Inventors

- Wang, Dasheng
- Kulp, Samuel
- Chen, Ching-Shih

Categories

- Healthcare Portfolios
- Life Sciences
- Therapeutics