### Reference Number
OU09002

### Inventors
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### Field
Cancer Therapeutics for Multiple Cancer Types [that over-express Glut1 and up-regulate glucose transport]

### Technology
Basal Glucose Transport Inhibitors as Anti-Cancer Therapeutics

### Stage of Development
- **In vitro** proof-of-concept in multiple cell lines achieved; further optimization of compounds required.
- Initial preclinical in vivo animal model studies show successful tumor inhibition.
- Literature evidence shows strong evidence for use of such inhibitors against multiple cancer cell types.

### Business Opportunity
- Available for licensing
- Seeking a development and commercialization partner

### IP Status
U.S. and PCT Applications Filed:
US/2012/0121536 A1
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### Background
Researchers at Ohio University have created a new class of cancer therapeutic compounds directed at a new cancer target with implications for broad efficacy across multiple cancer tumor types - more specifically, novel anti-cancer compounds that target basal glucose transport.

This novel therapeutic group of compounds focuses on the inhibition of basal glucose transport as a general attractive strategy for cancer treatment. Cancer cells are known to have up-regulated basal glucose transport and are "addicted" to glucose as their preferred and primary energy source. Inhibition of basal glucose transport cuts off this energy supply to starve the cancer cells thereby resulting in the reduction of cancer cell growth and ultimately apoptosis or cell death. In comparison, normal cells can use alternative energy sources, e.g., amino acids and lipids, in addition to glucose. Therefore, normal cells are not as sensitive and vulnerable to glucose deprivation.

To date, several clinical trials have been based on the concept of glucose deprivation through metabolic targeting (inhibition) of glycolysis. However, glucose deprivation through inhibition of glucose transport, the first rate-limiting step of glucose metabolism, had never been attempted due to the lack of specific glucose transporter inhibitors.

As such, this invention encompasses a group of effective and relatively non-toxic basal glucose transport inhibitors, such as WZB-117 (Glut1 inhibitors), directed toward the protein target Glut1. No such inhibitors have been available, creating a void and unmet need in the field of cancer treatments. This technology is in the form of a chemically synthesized and pharmacologically characterized group of novel, proprietary and potent small molecules. These small molecules inhibit basal glucose transport that is mediated primarily by glucose transporter 1 (Glut1). Glut1 up-regulated in almost all cancers that over-express Glut1 and that up-regulate glucose transport.
Basal Glucose Transport Inhibitors as Anti-Cancer Therapeutics

Potential/Commercial Applications
- Novel oral cancer therapeutic targeted against multiple cancer types.

Benefits of Technology
- New compound and new target in the treatment of cancer.
- Broad application as a therapeutic across multiple cancer types.
- Targeted small molecule therapeutic that does not affect normal cells.
- Inhibits glucose transport, the first rate-limiting step of glucose metabolism – the primary energy source for cancer cell growth, angiogenesis, and metastasis – for earlier therapeutic affects in the cancer cell cycle.

Inventors:

Dr. Stephen C. Bergmeier, PhD is a professor in the Department of Chemistry and Biochemistry at Ohio University. He has 7 patents in the area of drug discovery and has published over 80 peer-reviewed scientific manuscripts. Dr. Bergmeier carries out research in the general area of synthetic organic chemistry, designing new chemical reactions. Dr. Bergmeier's other research area is medicinal chemistry. He and his research group design and synthesize new therapeutics in the areas of cancer, infectious disease and neurological disorders.

Dr. Xiaozhuo Chen, PhD is an associate professor in the Department of Biomedical Sciences of Ohio University’s Medical School. He has worked in industry in the development of a human gene therapy technology, which was successfully licensed to a major biopharmaceutical company. Dr. Chen is a principal investigator at the University’s Edison Biotechnology Institute, where he focuses on cancer and diabetes research. He has expertise in the areas of glucose and energy transport and metabolism. With collaborators, he has developed therapeutics that target glucose transport, as well as small molecule insulin mimetics for stimulating glucose transport into fat cells for treatment of diabetes. Dr. Chen is an inventor on ten issued and pending patents.