Nonconfidential Summary Disclosure

UM 9210: Anticancer Formulation

THE TECHNOLOGY

The UM 9210 technology relates to compositions and methods for treating cancer and other metabolic disorders using gnetin H (GH) as a glycolysis inhibitor. The combination of GH with glucose 6 phosphate dehydrogenase inhibitors (DHEA) or mitochondrial complex 1 inhibitors results in synergistic and unexpected effects relative to administration of the inhibitors alone. The research data shows that GH & Peony seed extract (PSE), when combined with acetogenin extract from Paw Paw twigs (a mitochondrial complex I inhibitor), exhibit synergistic cytotoxicity against Temodar (TMZ)-resistant glioblastoma tumor and cancer stem cell (CSC) populations. GH in combination with DHEA rapidly killed T98G glioblastoma cells, while DHEA in combination with other glycolysis inhibitors is not cytotoxic. This synergistic composition also demonstrates reduced melanoma tumor growth and/or tumor burden and appears to induce apoptosis in cancer cells and cancer stem cells containing either wild type or dysfunctional p53.

Early in vitro testing of the mixture of these agents results in synergistic cell apoptosis. In vivo models have also shown dramatic reductions in tumor growth.

In cancer cells lacking functional p53, this combination did not induce apoptosis, but instead resulted in cell cycle arrest in G2-M.

Additionally, in contrast to other glycolysis inhibitors, GH alone has been demonstrated to show a reduction of TXNIP mRNA and protein, and may be therapeutically relevant for treatment of other metabolic conditions related to type-2 diabetes.

COMPETITIVE ADVANTAGE

In efforts to identify more targeted and less toxic approaches for cancer therapy recent research has increasingly focused on the metabolic differences exhibited by cancer cells, especially the enhanced use of glycolysis by cancer cells for both ATP production and metabolic building blocks to support cell proliferation. However cancer cells, upon treatment with glycolysis inhibiting agents, will adapt by enhancing use of mitochondrial oxidative phosphorylation to meet energy needs.

UM 9210 addresses this adaptation by employing agents that target oxidative phosphorylation using mitochondrial complex I inhibitors such as metformin or phenformin in a synergistic combination with compounds that inhibit glycolysis.

DEVELOPMENT POTENTIAL

Proof of concept testing and head to head studies performed in the laboratory in well-known in vitro and in vivo assays. We are seeking a development and commercialization partner.

PATENT STATUS

Patent Pending - WO 2020/056425

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KEYWORDS

Mitochondrial complex I inhibitor, glucose inhibitor, lactic acid inhibitor, glycolysis inhibitor, Gnetin H, cancer, diabetes, metabolic derangement

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