Case #438

Triacetin Treatment as Cancer Adjuvant

Cancer cells exhibit numerous genetic, epigenetic and metabolic changes and it is this dysregulation that leads to the rapid cell growth of highly malignant cancers, such as glioblastoma multiforme (GBM). The Jaworski lab has identified and tested an FDA approved food additive, triacetin (glyceryl triacetate, GTA) that induces cell growth arrest in GBM cells, while having little to no effect on healthy cells. Further work has shown that GTA functions at the intersection of metabolism and epigenetics, converting to acetyl co-enzyme A, reversing the Warburg effect and promoting acetylation of histones H3 and H4, which facilitates an open chromatin state for access of DNA chemotherapeutic agents. *In vivo* studies show that GTA is a valuable adjuvant, significantly increasing survival when given in combination with temozolomide and other currently prescribed alkylating agents.

Applications:

- Adjuvant for primary glioma tumors, neuroblastoma and melanoma.
- Potential adjuvant for other cancer types and radiation treatments.

Advantages:

- Orally administered and easily absorbed by GI system.
- FDA approved, with low risk of side effects.
- Minimal toxicity to non-cancerous cells.

Intellectual Property and Development Status:

US Non-Provisional Application US20140142152A1
Looking for research and development collaboration and licensing opportunities.

References:

Acetate as a Metabolic and Epigenetic Modifier of Cancer Therapy. Jaworski DM, Namboodiri AM, Moffett JR. J Cell Biochem., doi: 10.1002/jcb.25305, 2015.

Acetate supplementation as a means of inducing glioblastoma stem-like cell growth arrest. Long PM, Tighe SW, Driscoll HE, Fortner KA, Viapiano MS, Jaworski DM. J Cell Physiol., 230:1929-43, 2015

Triacetin-based acetate supplementation as a chemotherapeutic adjuvant therapy in glioma. Tsen AR, Long PM, Driscoll HE, Davies MT, Teasdale BA, Penar PL, Pendlebury WW, Spees JL, Lawler SE, Viapiano MS, Jaworski DM. Int. J. Cancer, 134: 1300–1310, 2014

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