"Cancer Stem Cell Target Sulfated Flavonoid Oligomers"

VCU #13-087

Applications

- Supplement ongoing chemotherapy and/or radiation treatment
- Augment treatment of refractory cancers
- Second-line drug to prevent cancer recurrence
- Treatment of a variety of cancers, efficacy demonstrated in colorectal cancer

Advantages

- Target cancer stem-like cells - demonstrated inhibition in colorectal cancer model
- Novel glycosaminoglycan mimetics with selective inhibitory effects
- Small molecules and easy to synthesize
- Target fundamental pathways crucial to cancer stem cells survival, renewal and induction of differentiation

Inventors

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Market Need

The cancer stem-like cell (CSC) hypothesis may explain the shortcomings of current anti-cancer therapeutics and posits a paradigm-shifting direction for the discovery of new anti-cancer drugs. The major shortcomings of the current anti-cancer therapeutics are the primary and acquired resistances to cytotoxic therapies, leading to disease recurrence. This phenomenon is likely to be a result of a very small population of cancer stem-like cells that posses the ability to self-renew, differentiate and reconstitute the entire tumor after initial treatment. Clearly, a therapeutic that selectively targets cancer stem-like cells to inhibit their self-renewal and differentiation potential is key to improving the survival of cancer patients.

Technology Summary

We have synthesized novel sulfated flavonoid oligomers that are able to inhibit the self-renewal and differentiation potential of cancer stem-like cells (CSCs). They modulate the interaction of glycosaminoglycans with protein factors, which are involved in growth and/or differentiation signaling, resulting in the **reduction** of the incidence of cancer recurrence due to CSCs. These novel molecules are non-polymeric glycosaminoglycan mimetics that are easy to synthesize, homogenous, highly water soluble, and bind to their protein targets, thereby providing a much higher level of selectivity. Efficacy has been demonstrated in murine tumor graft model of colorectal cancer.

Technology Status

In vitro and *in vivo* testing has been performed on the proposed molecules in murine xenograft models.

U.S. Patent: US-2016-0280676-A1
Article: Patel 2014
This technology is available for further development and commercialization.