Anti-Cancer Therapeutics

Organization
University of Missouri-Columbia

Industry:
Bio-Science, Human Health

Researchers:
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Status of Intellectual Property:
Multiple issued and pending

Next Steps:
Licensing to established company or startup
Clinical Trials

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Customer Problem

Cancer is a leading cause of death globally, second only to cardiovascular disease. Existing treatments are insufficient, exhibiting 5 year survival rates for metastatic breast cancer and prostate cancer patients at 25%-30%; lung, colon, kidney, and pancreatic are 5%-10%. Society can benefit from new classes of chemotherapeutics. Every cancer is unique, so every new chemotherapeutic we can add to the toolbox helps.

Potential Market Uses

Cancer treatment utilizing oxidosqualene cyclase (OSC) inhibitors. Through testing, there has been a demonstrated efficacy in breast cancer – in vitro and in vivo data, prostate cancer – in vitro data, and chronic lymphocytic leukemia – in vitro and ex vivo data. This application can potentially be extended to other cancer types than those listed.

Market Size

In 2018, there will be an estimated 1,735,350 new cancer cases diagnosed and 609,640 cancer deaths in the United States. (Cancer Statistics 2018, a scientific paper published in the American Cancer Society journal, *CA: A Cancer Journal for Clinicians*)

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Innovation/Background

Using computational analysis of a known tumor suppressor with a previously unidentified mechanism of action, researchers at the University of Missouri have identified oxidosqualene cyclase (OSC) inhibitors as a novel target for the treatment of various tumor types. Further research demonstrates efficacy using novel inhibitors. Affected in vitro model tumor types include breast, prostate, colon, lung, ovary, pancreas cancers and lymphocytic leukemia.

OSCs are key members of the cholesterol biosynthesis pathway. The work of MU inventors demonstrate inhibition of OSCs achieve significant reduction of breast cancer cell growth through induction of anti-proliferative protein and estrogen receptor beta (ERβ) in both estrogen receptor alpha (ERα)-positive and ERα-negative breast cancer cell lines (including triple negative cells). A complete reduction of ERα in ERα-positive breast cancer cells was seen. As ERβ is known to inhibit breast cancer cell proliferation, combination studies were performed demonstrating additive effects of OSC inhibitors and ERβ agonists. Therapies targeting key molecular mechanisms are transforming the way people treat cancer.

MU inventors have uncovered a novel therapeutic pathway and demonstrated efficacy using novel molecules to enable a new class of cancer therapeutics.

Competitive Advantages

This treatment has a novel target with demonstrated efficacy, as well as compounds for treatment.