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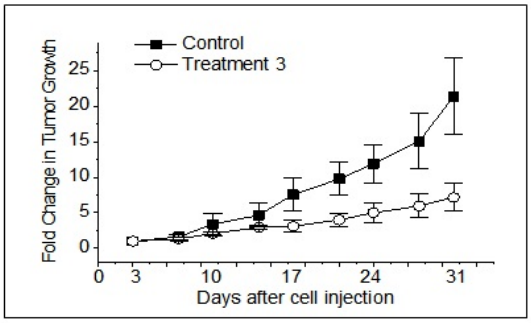
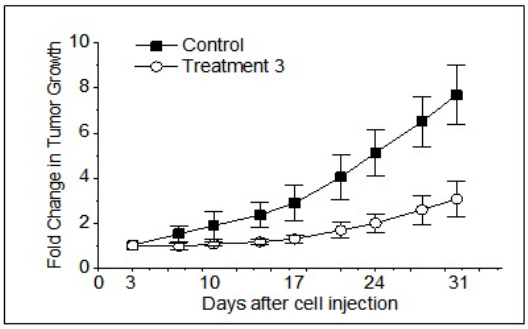
Anti-Cancer Compounds Enhance Treatment of Cancers That Over-Express COX-2 (RFT-531)

Invention Summary

Scientists at North Dakota State University have developed an anti-cancer compound with potential to treat multiple cancer types. The compound targets delta-5-desaturase, providing anti-cancer benefits in two ways: Down regulation of 'pro-cancer' prostaglandins (via arachidonic acid); and elevated production of the recently characterized anti-cancer compound, 8-hydroxyoctanoic acid (8-HOA). To our knowledge, this technology represents the first anti-cancer compound to take advantage of the commonly seen COX-2 over-expression in tumors. Since that over-expression leads to prostaglandin production, a common strategy has been to completely block COX-2, shutting down the beneficial aspects of COX-2 in order to eliminate the negative aspects. NDSU's technology is more targeted, selectively turning down COX-2's negative aspects, while taking advantage of COX-2 over expression to boost production of 8-HOA. While the exact anti-cancer mechanism of 8-HOA hasn't been determined, it has been characterized as a histone deacetylase inhibitor, so may act like other anti-cancer HDACs.



Treatments of D5D inhibitor and DGLA in HCA-7 (colon) xenograft tumors reduced tumor growth by up to 67%



Treatments of D5D inhibitor and DGLA in BxPC-3 (pancreatic) xenograft tumors reduced tumor growth by up to 60%

Similar outcomes were seen with A549 (lung) xenograft tumors, and in preliminary studies with breast cancer tumors, as well as in combinations of these treatments and currently used drugs.

Benefits

- Down-regulate 'pro-cancer' prostaglandins that are produced via arachidonic acid, and which are over-expressed in many tumors due to high levels of COX-2 activity
- Retain therapeutic level of 8-HOA, also produced at high levels due to COX-2, which thereby produces this natural anti-cancer HDAC right at the tumor
- Effective in multiple tumor types - reduced growth rate of tumors by 50% to 70% in mice bearing breast, colon, pancreatic, and lung tumors
- Preliminary data shows additional slowing of tumor growth when co-administered with leading anti-cancer drugs, indicating potential to boost efficacy of existing drugs

Technology

The technology consists of a class of small molecules, which have been tested in the lab using mouse, bearing tumors for breast, colon, pancreatic, and lung cancers.

Patents

This technology is patent pending in the U.S.

Contact

Saurabhi Satam, Business Development and Licensing Associate
ssatam@ndsurf.org
(701)231-8173

NDSURF Tech Key

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