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Our research is dedicated to the discovery of more effective therapies for the treatment of cancer. There are several aspects to our work including drug discovery, identification of the mechanisms of drug action, the nature of drug resistance, identifying rational drug combinations and elucidation of the signaling pathways by which anti-mitotic agents initiate mitotic arrest and apoptosis.

Drug Discovery- We conduct a drug discovery program to identify new anticancer agents from natural products and from small molecule chemical libraries. With collaborators all over the world we evaluate extracts and compounds from marine organisms and plants to identify new drug leads. We have an extensive library of plant extracts that have been evaluated for a variety of biological activities including cytotoxic actions against breast and prostate cancer cell lines. The active compounds are being isolated using bioassay-guided fractionation.

Identification of the Mechanism of Action of New Drugs After discovering new agents we identify their molecular mechanisms of action. This includes identifying the cellular binding site and how they work to impact cancer cell survival. We are currently investigating new microtubule stabilizers, anti-angiogenics and vascular disrupting agents.

Elucidating Signaling Pathways of Anti-Mitotic Agents Antimitotic drugs are some of the most effective used in cancer therapy, but the signaling pathways that lead from inhibition of mitotic spindle dynamics to initiation of apoptosis is not yet known. We are elucidating these pathways to identity new drug targets that can yield the efficacy of microtubule disrupting drugs without tubulin-related limiting toxicities.

Selected Laboratory Publications 2007-2008 (out of 10)

Mooberry, SL, Hilinski, MK, Clark, EA, Wender, PA. Function oriented synthesis; Biological evaluation of laulimalide analogs derived from a last step cross metathesis diversification strategy. In Press Mol. Pharmaceutics, July, 2008.

Tripathi, A., Fornabaio, M., Kellogg, G.E.,. Gupton, J.T., Gewirtz, D.A., Yeudall, W.A., Vega, N.E and Mooberry, S.L. Docking and Hydropathic Scoring of Polysubstituted Pyrrole Compounds with Anti-Tubulin Activity. Bioorganic & Medicinal Chemistry, 16:2235-2242, 2008.

Mooberry, S.L., Weiderhold, K.N., Dakshanamurthy, S. Hamel, E., Banner, E.J., Kharlamova, A., Hempel, J., Gupton, J.T. and Brown, M.L. Identification and characterization of a new tubulin-binding disubstituted brominated pyrroles. Mol Pharmacol., 72, 132-40, 2007.