

# Novel Melampomagnolide-based Anti-Cancer Drugs and Pro-Drugs that Target Leukemia Stem Cells

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## Technology description

Adult acute leukemia is an extremely serious disease, resulting in death for the majority of patients. Despite decades of intensive research, long-term cures are obtained for only approximately 30% of patients. Thus, there is an urgent need for the development of treatment regimens that are more efficacious and less toxic to normal tissues. The laboratory of Dr. Jordan and his collaborators at the University of Kentucky are developing novel compounds based on the naturally occurring molecule parthenolide. Agents in this class (known as sesquiterpene lactones) have demonstrated utility for multiple pharmacological applications, but have never been fully developed for modern clinical use. Drugs of this nature function to eradicate leukemia cells in a unique fashion. Dr. Jordan has clearly demonstrated that parthenolide-based drugs can specifically target the cells that are typically not destroyed by standard chemotherapy, the so-called leukemia stem cells. Studies over the past decade have shown that this relatively rare subpopulation of cells lie at the root of leukemic disease, and are typically highly resistant to conventional therapy. Thus, in order to achieve more effective clinical results, it is widely appreciated that therapies must target this population.

## Application area

This invention describes the development of a novel family of anti-leukemic agents based on the melampomagnolide-B (MMB) molecule that specifically target the cells that are typically not destroyed by standard chemotherapy, leukemia stem cells. Once efficacy is confirmed in blood cancers, it might be possible to target other cancer stem cells with the same drugs and prodrugs.

## Advantages

Novel therapies for AML are desperately needed since current treatments have a 5 year survival rate of approximately 20%. These drug-leads present the ability to eradicate leukemic stem cells while sparing normal tissue.

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