Novel Multi-Isoform ALDH Inhibitor

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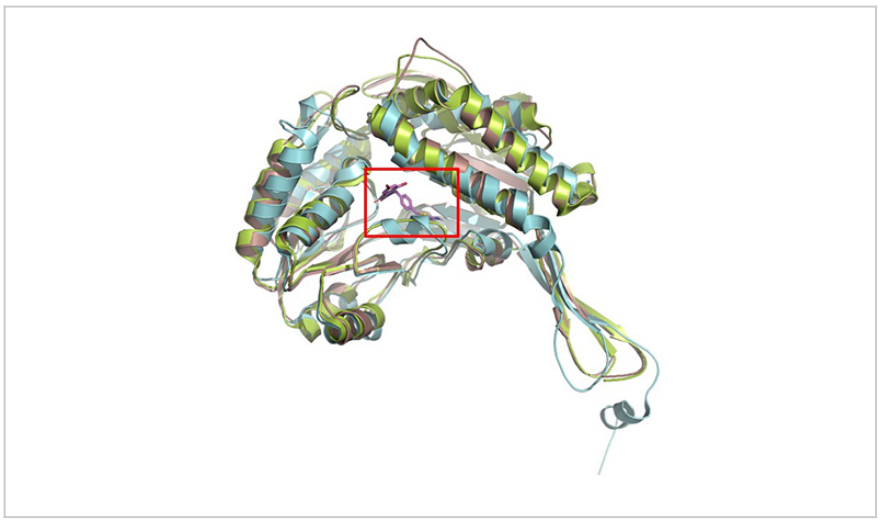

Structure of KS100

Technology Summary

The aldehyde dehydrogenases (ALDHs) are a family of detoxifying enzymes that are overexpressed in various cancers. Researchers have developed a novel, broad-spectrum, small molecule ALDH inhibitor, KS100. Enzymatic IC50s of KS100 were 207, 1,410, and 240 nM towards ALDH1A1, 2, and 3A1, respectively.

The systemic toxicity of KS100 was mitigated by development of a stable nanoliposomal formulation, NanoKS100. NanoKS100 is 5-fold more selective for killing melanoma cells as compared to normal human fibroblasts. NanoKS100 administered intravenously was effective at inhibiting tumor growth by ~65% without organ related toxicities in xenograft melanoma mouse models. Recent experimental data demonstrate synergism of NanoKS100 with targeted and immune therapies to reduce tumor volume and drug resistance.

Application & Market Utility

Increased expression of ALDH is associated with poor prognosis, stemness, and drug resistance in various cancers. While several ALDH inhibitors are known, few have broad spectrum activity, and fewer yet have been evaluated in a clinical study for cancer therapy. This invention seeks to improve cancer therapy through use of a broad-spectrum ALDH inhibitor that directly targets stem cell like cancer cells as a monotherapy or in combination with conventional therapeutics or emerging immunotherapies.

Next Steps

Continue lead optimization and expand investigation of combination therapy with immunotherapies, including PD-1 and PD-L1 checkpoint inhibitors. Seek commercial partner to progress primary clinical candidate to IND.

TECHNOLOGY READINESS LEVEL 4-7

Seeking

Licensing |

Keywords

- ALDH
- Cancer Stem Cells
- Therapy Resistance
- Therapeutic
- Nanoliposome

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