A New Class of piRNA-based Cancer Therapeutics

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Description:

PIWI-interacting RNAs (piRNAs) are a novel class of small noncoding RNAs (24-32 nt), that guide PIWI proteins to transposons and stabilize the genome. piRNA class includes >30,000 unique types with <100 gene targets, functions both in cytoplasm and in nucleus and mediates both transcriptional and post-transcriptional regulation.

Advantages of piRNA-based therapeutic approach compared to siRNA and miRNA-based approaches:

• higher target specificity, due to longer seed sequences of piRNAs.
• higher tissue specificity, as many PIWI proteins are expressed only in tumor cells.
• gene-specific DNA methylation and gene silencing at transcriptional level
• higher efficacy and lower toxicity.

• Demonstrated cancer-specific in-vitro and in-vivo efficacy in several cancer models, including liver cancer and glioblastoma. Potential diagnostic and research tool applications.

• Lead Innovator: Yong Zhu, Ph.D.
• IP status: PCT/US17/19741 filed.
• References: Oncotarget (in press); CEBP (2016); Carcinogenesis (2015).

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Figure, piR-8041 reduces cell growth by ~50%. Top: Bioluminescence measurements of luciferase-expressing intracranial tumors at multiple time points Bottom: Images of representative mice from each treatment group on day 10 after tumor implantation.