A New Class of piRNA-based Cancer Therapeutics

OCR Number: OCR 6901

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).

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.

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