

ALLELE SPECIFIC SHRNA FOR NANOG, AND ITS USE TO TREAT CANCER

SUMMARY

The National Cancer Institute announced positive study results indicating that the expression of NanogP8, a pseudogene of Nanog, is upregulated in human colorectal cancer spheroids formed in serum-free medium. The National Cancer Institute's Laboratory of Experimental Carcinogenesis seeks parties of interest to co-develop the use of shRNAs incorporated into a lentiviral vector as a gene therapy to inhibit NanogP8, a retrogene upregulated in several carcinomas.

REFERENCE NUMBER

E-294-2010

PRODUCT TYPE

- Therapeutics

KEYWORDS

- Colorectal
- Prostate
- GlioblastomasStem cells
- shRNA
- NanogP8

COLLABORATION OPPORTUNITY

This invention is available for licensing.

CONTACT

John D. Hewes

NCI - National Cancer Institute

240-276-5515

John.Hewes@nih.gov

DESCRIPTION OF TECHNOLOGY

Cancer stem cells are currently thought to be major participants in resistance to radiation therapy and chemotherapy; they are also thought to drive the spread of cancer through metastasis. It has been postulated that genes involved in early embryogenesis, primarily transcription factor Nanog but also Oct4 and SOX2, may be reactivated to maintain the properties of cancer stem cells, any treatment that inhibits such genes may therefore inhibit the progression of cancer and lead to improved survival and other clinical outcomes.

NCI scientists are developing a unique inhibitory RNA molecule that specifically targets NanogP8, which

NCI Technology Transfer Center

<https://techtransfer.cancer.gov/pdf/e-294-2010.pdf>

is upregulated in human colorectal cancer spheroids, human prostate cancer and glioblastomas. The discovery may improve the safety of a shRNA-based gene therapy and improve its chances for acceptance as a clinical therapy.

POTENTIAL COMMERCIAL APPLICATIONS

- Improve the safety of a shRNA-based gene therapy and improve its chances for acceptance as a clinical therapy.
- Novel cancer target given that NanogP8 is the only cancer-promoting retrogene exclusive to humans.

COMPETITIVE ADVANTAGES

- Potential new therapy that targets colorectal cancer as well as other cancers.
- Specifically knocks down expression of NanogP8 without interfering with expression of Nanog.

INVENTOR(S)

John Jessup, MD (formerly of NCI) and Jingyu Zhang, PhD (formerly of NCI)

DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PATENT STATUS

- **U.S. Issued:** US 9,163,236

THERAPEUTIC AREA

- Cancer/Neoplasm