



DNAzymes to Treat Glioma

The Technology

Glioma is an aggressive brain cancer with a median survival of less than 12 months from diagnosis. Because of their location in the brain, most gliomas can not be fully removed by surgical resection. Traditional small molecule therapeutics have not provided effective treatments for glioma.

Recognizing that matrix metalloproteinase (MMP) expression is correlated with tumor invasion and metastasis, researchers at the University of Tennessee Health Science Center have demonstrated that blocking matrix MMP expression with DNAzymes is able to inhibit tumor growth.

Unlike traditional small molecules which inhibit matrix metalloproteinases by binding to the active site of the enzyme, catalytic DNAzymes work by degrading the mRNA and blocking the protein from being produced. In both in vitro and in vivo models the inventors demonstrated that DNAzymes targeting MMP-2 and/or MMP-9 are taken up by cells and inhibit production of the target enzymes. Furthermore, in a rat model of C6 glioma it was shown that anti-MMP DNAzymes were able to significantly inhibit tumor growth and decrease the tumor burden by 70%.

Benefits

- Create a new market – No existing effective chemotherapeutic agents for the treatment of glioma.
- Lower regulatory hurdles – Because of the extremely poor clinical prognosis for glioma, modest clinical efficacy would support faster regulatory approval.
- Reduced side effects – DNAzymes are extremely targeted and will only degrade the mRNA of interest.

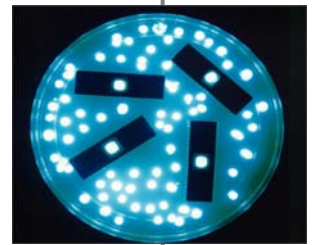
The Inventors

Dr. Tayebah Pourmotabbed is a Professor of Molecular Sciences in the College of Medicine at the University of Tennessee Health Science Center. Her research interests include cancer therapy, understanding the structure-function relationship of matrix metalloproteinases, and identifying risk factors in Alzheimer's and coronary artery disease.

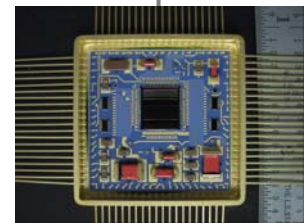
AGRICULTURE



BIOTECHNOLOGY



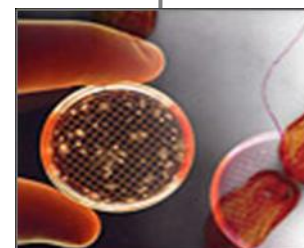
ENGINEERING



MATERIALS



MEDICINE





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Patents

- One US patent application has been filed (US publication #2006/0019914)

Contact

The University of Tennessee Research Foundation (UTRF) is a non-profit corporation responsible for commercializing University of Tennessee technologies and for supporting University research. UTRF is seeking parties interested in learning more about this technology and in exploring possible research and/or commercialization arrangements.

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