VUmc VU University Medical Center Amsterdam

Licensing Opportunity

LIFE SCIENCES CENTER AMSTERDAM

microRNAs at the blood-brain barrier, novel targets for treatment of neurological diseases

- **The blood-brain barrier is dysfunctional in many neurological diseases**
- **The blood-brain barrier forms an important impediment to treat malignant brain cancers**
- **microRNA treatment modulates the in vitro blood-brain barrier**
- **Therapeutic application of microRNAs or microRNA inhibitors holds significant promise for treatment of diverse neurological diseases**
- **Efficient delivery methods may make microRNA therapy useful for diverse neurological diseases**

Radiology | Radio Nucleotide Imaging 2011

Background

Homeostasis of the brain is dependent on the blood-brain barrier. This intricate barrier, which is comprised of special brain endothelial cells, dictates the exchange of essential nutrients and limits the entrance of molecules and immune cells into the central nervous system. Blood-brain barrier function is diminished in several neurological diseases, including multiple sclerosis, Alzheimer's disease, stroke and traumatic brain injury. On the other hand this barrier forms an important hurdle for effective treatment of malignant brain cancer by blocking the delivery of potentially active therapeutic compounds. Therefore, the blood-brain barrier is an attractive target for treatment of neurological diseases.

The Technology

Using a combined genomics and bioinformatics approach, researchers at the VU Medical Center have discovered that microRNAs can regulate the in vitro blood-brain barrier. These fi ndings allow the design of novel therapeutic approaches for several neurological diseases in which blood-brain barrier repair is required or controlled opening is needed for effective treatment in for example brain cancer. To effectively develop the functional targets into novel therapeutics for brain diseases, we are interested to close co-development partnerships with commercial partners.

Intellectual Property

A patent (P29970) was filed on August 13, 2010 as a US application (US 61/349,337) together with a Dutch application (NL2005227).

Inventors

De Vries Helga Eveline [NL] and Reijerkerk Arie [NL].

Key publications

1. Reijerkerk, A, K.A.M. Lakeman, J.A.R. Drexhage, B. van het Hof, Y. van Wijck, G. Kooij, D. Geerts, and and H. E. de Vries. 2011. Brain endothelial barrier passage by monocytes is controlled by the endothelin system. J Neurochem, in press.

2. Reijerkerk, A., G. Kooij, S. M. van der Pol, T. Leyen, K. Lakeman, B. van het Hof, D. Vivien, and H. E. de Vries. 2010. The NR1 subunit of NMDA receptor regulates monocyte transmigration through the brain endothelial cell barrier. J. Neurochem. 113:447.

3. Reijerkerk, A., G. Kooij, S. M. van der Pol, T. Leyen, H. B. van het Hof, P. O. Couraud, D. Vivien, C. D. Dijkstra, and H. E. de Vries. 2008. Tissue-type plasminogen activator is a regulator of monocyte diapedesis through the brain endothelial barrier. J. Immunol. 181:3567.

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