Modulation of EMT/MET States of Cancer Stem Cells

Technology #5299

A new discovery may hold the key to treating a longstanding disease.

MicroRNAs, or miRNAs, are short pieces of non-protein-coding regulatory ribonucleic acid (RNA) averaging 20 nucleotides in length that were first discovered in 1993. To date, nearly 1000 have been identified in the human genome and are reported to play an active role in nearly every cell type. Interestingly, it has been reported that different cancers produce unique miRNAs, and several studies have shown that miRNAs can act either as tumor suppressors or as oncogenes. Measurement of miRNA expression in tumors may have important diagnostic and prognostic uses.

MicroRNA expression can dictate cancer metastasis.

A growing list of reports demonstrates that miRNAs play a critical role in cancer initiation and progression, and that miRNA alterations are ubiquitous among human cancers. Scientists at the University of Michigan have found that the metastatic potential of breast cancer cells can be influenced by expression of specific miRNA agonists or antagonists. Overexpression of one specific miRNA identified by researchers significantly increased the invasiveness of cancer cells enabling them to enter the circulation and travel to distant organs where they can form micrometastasis. Now, in order to enter a proliferative state in vivo, these cells must undergo a transition in which they lose their invasive characteristics and acquire self-renewal capacity. miRNA capable of initiating this transition has also been identified by researchers. The growth and metastasis state of tumor cells regulated by miRNAs plays an important role in mediating tumor invasion, therefore these miRNAs may serve as key prognostic and therapeutic targets.

Applications and Advantages

Applications

- Evaluation of tumor malignancy.
- Potential therapeutic target.

Advantages

- Easy to measure.
- Reliable prognostic indicator.

Inventors

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