Identification of a gene expression signature associated with cancer metastasis allows early detection and drug targeting

Technology #cu12225

Cancer is a leading cause of death worldwide. Despite therapies available to treat primary cancers, there are many cancer patients in remission who relapse with a more fatal metastatic cancer. Cancer cells can undergo an epithelial mesenchymal transition (EMT), which provides them with enhanced invasive and migratory capacity, as well as elevated resistance to apoptosis. This technology characterizes a gene expression signature consisting of several microRNAs that are associated with EMT in invasive solid cancers. This group of microRNAs can be used for diagnosing and staging of pre-metastatic cancers. Furthermore, microRNA inhibitors may potentially be used to prevent or treat invasive cancers before they undergo metastasis.

Utilizing inhibitors of microRNAs associated with EMT to prevent metastasis and cancer recurrence.

Current therapeutic approaches to treating invasive cancers include surgical removal, radiation, chemotherapy, or hormone therapy. These methods aim to simply remove cancerous cells without affecting the invasive nature of these cells, which may lead to resistant cancer cells that relapse and cause subsequent metastasis after treatment. This technology describes inhibitors that target the microRNAs associated with epithelial mesenchymal transmission in invasive solid cancers, which prevent the cancer cells from adopting migratory and resilient stem cell properties. Not only could these inhibitors reduce metastasis of primary cancers, but they could also prevent the recurrence of cancer by reducing the cells’ resistance to apoptosis. Furthermore, this list of microRNAs can be used in diagnostic screens for better staging of invasive cancers and earlier detection of metastasis than current methods provide.

Identification of the gene expression signature associated with EMT in invasive cancers was done through cancer dataset analysis. They were validated by expressing these microRNAs in xenografts in mice.

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Applications:

- A therapy using miRNA inhibitors to target the miRNA associated with EMT and subsequent cancer relapse or metastasis
- Other drugs can be developed to target the miRNA associated with EMT in invasive cancers
- Expression of individual and combinations of EMT-associated miRNA in a laboratory setting to further study cancer metastasis
- Screening for presence of EMT-associated miRNA in cancer patients for early diagnosis and staging of metastatic cancer

Advantages:

- Inhibitors actually target invasive ability of cancer cells that undergo EMT, decreasing metastasis ability
- Inhibitors reduce resilience of cancer cells that undergo EMT, which may increase effectiveness of current cancer treatments
- Earlier detection of cancer cells that may metastasize

Patent information:
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Related Publications:

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