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生命科学

Core 3 synthase expression possibility to reduced EMT transition in breast cancer

TECHNOLOGY SHOWCASE

■ はじめに

Core 3 structure is a mucin-type *O*-glycans synthesized by β1,3-*N*-acetylglucosaminyltransferase 6 (core 3 synthase), which plays an important role in the digestive system. It has been reported that core 3 synthase-expressing in several cancer cell types show lower migratory and invasive rates and metastatic activity. This enzyme expresses in normal epithelial cells of the colon but completely disappeared in colorectal cancer cells. In our previous report, patients with distal cholangiocarcinoma positive for anti-core 3 synthase antibody showed lower mortality rates than those with negative expression. However, the molecular mechanism of this enzyme on cancer progression has not been elucidated. Therefore, this present study aimed to evaluate the effect of core 3 synthase in cancer metastasis and EMT transition.

■ 活動内容

1. Core 3 synthase expression and glycan structure alteration

The stable core 3 synthase-expressing cells were established (A549+B3GNT6 and MCF7+B3GNT6). The evaluation of glycan structure alteration was done using peanut agglutinin (PNA) and jacalin for determining the expression of core 1 and core 3 structures respectively. Core 1 structures were found to be decreased while jacalin staining showed high expression of core 3 glycan structures in core 3 expressing cells but not mock cells. It is probably due to a competition to utilize the 3' position of GalNAc on the glycoproteins.

2. Cell migration and EMT induction

- Migration assay was analyzed using trans-well method. A549 and MCF7 core 3 expressing cells decreased migration activity by 36.48% of migration activity.
- EMT was induced StemXVivo EMT inducing media supplement. After EMT induction cells developed migratory characteristics and changed to an elongated spindle shape. EMT-induced cells showed dramatically changed, including decreased E-cadherin expression in all cells except MCF7 cells with core 3 synthase positivity that still show higher E-cadherin than control cells.

3. Transcriptome analysis

To evaluate the molecular mechanism of this enzyme after EMT induction in cancer cells, using transcriptome analysis (RNA sequencing) of core 3 expressing cells with and without EMT induction is still ongoing. The molecular mechanism (s) that regulates core 3 synthase expression and the factors that engage with migration activity will be further examined.

■ 関連情報等(特許関係、施設)

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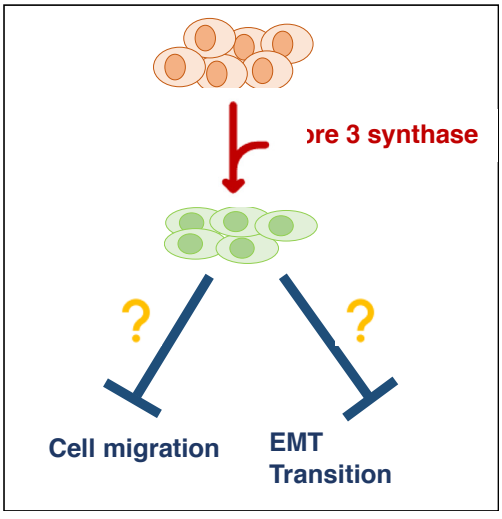
2. Boottanun P, et al. Association between the expression of core 3 synthase and survival outcomes of patients with cholangiocarcinoma. Oncol Lett. 2021 Nov;22(5):760.



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(2) Cancer metastasis
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