

Expression of GALNT2 in human extravillous trophoblasts and its suppressive role in trophoblast invasion

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Abstract

Extravillous trophoblast (EVT) invasion plays a critical role in placental development. Integrins bind to extracellular matrix (ECM) proteins to mediate EVT cell adhesion, migration, and invasion. Changes in *O*-glycans on β 1-integrin have been found to regulate cancer cell behavior. We hypothesize that *O*-glycosyltransferases can regulate EVT invasion through modulating the glycosylation and function of β 1-integrin. Here, we found that the *GALNT1* and *GALNT2* mRNA were highly expressed in HTR8/SVneo and first trimester EVT cells. Immunohistochemistry and immunofluorescence staining showed that GALNT2 was expressed in subpopulations of EVT cells in deciduas, but not in syncytiotrophoblasts and cytotrophoblasts of placental villi. The percentage of GALNT2-positive EVT cells increased with gestational ages. Overexpression of GALNT2 in HTR8/SVneo cells significantly enhanced cell-collagen IV adhesion, but suppressed cell migration and invasion. Notably, we found that GALNT2 increased the expression of Tn antigen (GalNAc-Ser/Thr) on β 1-integrin as revealed by *Vicia Villosa* agglutinin (VVA) binding. Furthermore, GALNT2 suppressed the phosphorylation of focal adhesion kinase (FAK), a crucial downstream signaling molecule of β 1-integrin. Our findings suggest that GALNT2 is a critical initiating enzyme of *O*-glycosylation for regulating EVT invasion.

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