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TNIIIA2, a Tenascin-C-derived peptide, modulates tumor cell survival, proliferation and differentiation: Implication of β 1-integrin activation in cell regulation

Takuya Iyoda

Tokyo University of Science, Japan

Cell adhesion to extracellular matrix (ECM) participates in various biological processes, such as cell survival, proliferation, differentiation, and migration. Since these events are essential for keeping homeostasis, aberration of these processes leads to a variety of diseases including cancer.

One of the most intriguing ECM proteins is Tenascin (TN)-C. The expression level of TN-C in normal adult is relatively low, whereas it is expressed predominantly during embryogenesis. Moreover, the expression of TN-C becomes higher during inflammation, wound healing, and neoplastic processes. TN-C is also characterized by its multifunctional properties in cell adhesion, migration, proliferation/survival, and differentiation. However, little or no evidence has been accumulated how TN-C exerts its functions as a modulator of various cellular events.

Since TN-C mRNA is alternatively spliced within the fibronectin type III-like (FN-III) repeats, various isoforms of TN-C could be generated. We previously found a bioactive peptide from the FN-III repeat A2 of TN-C. This peptide TNIIIA2 could stimulate cell adhesion to ECM through activation of \Box 1-integrin. Recently, we observed that TNIIIA2 modulates cell survival/ proliferation and differentiation in several tumor cell lines. Interestingly, TNIIIA2 could not only enhance cell proliferation, but also induce apoptotic cell death, depending on cellular context.

We will show the recent observations about the function of peptide TNIIIA2, and refer to the possibility of new strategy for tumor suppression by regulating cell adhesion status using the ECM-derived functional peptides.

Biography

Takuya Iyoda is an assistant professor with Tokyo University of Science, Faculty of Pharmaceutical Sciences. He has completed his Ph.D from Toho University, Faculty of Science, and post-doctoral studies with the University of Tennessee, College of Veterinary Medicine. After that, he had worked as an assistant professor with Fukuoka University, Faculty of Medicine, from 2008 to Mar. 2011. His background is immunology and cell biology.

iyoda@rs.tus.ac.jp