Programmed cell death protein 10

A protein that in humans is encoded by the PDCD10 gene.

This gene encodes a protein, originally identified in a premyeloid cell line, with similarity to proteins that participate in apoptosis. Three alternative transcripts encoding the same protein, differing only in their 5' UTRs, have been identified for this gene.

Programmed cell death 10 (PDCD10) is ubiquitously expressed in nearly all tissues and plays crucial roles in regulating angiogenesis and apoptosis.

Zhu et al. discovered the absence of PDCD10 expression in the tumor vessels of GBM patients. This raised the hypothesis that loss of endothelial PDCD10 affected GBM cell phenotyping and tumor progression.

Endothelial PDCD10 was silenced by siRNA and lentiviral shRNA. The tumor cell phenotype was studied in direct and indirect co-culture of endothelial cells (ECs) with U87 or LN229. Angiogenic protein array was performed in the media of PDCD10-silenced ECs. Tumor angiogenesis and tumor growth were investigated in a human GBM xenograft mouse model.

Endothelial silence of PDCD10 significantly stimulated tumor cell proliferation, migration, adhesion, and invasion and inhibited apoptosis in co-cultures. Stable knockdown of endothelial PDCD10 increased microvessel density and the formation of a functional vascular network, leading to a 4-fold larger tumor mass in mice. Intriguingly, endothelial deletion of PDCD10 increased (≥2-fold) the release of 20 of 55 tested proangiogenic factors including VEGF, which in turn activated Erk1/2 and Akt in GBM cells.

For the first time, there is evidence that loss of endothelial PDCD10 activates GBM cells and promotes tumor growth, most likely via a paracrine mechanism. PDCD10 shows a tumor-suppressor-like function in the cross talk between ECs and tumor cells and is potentially implicated in GBM progression [1)].

1)
Zhu Y, Zhao K, Prinz A, Keyvani K, Lambertz N, Kreitschmann-Andermahr I, Lei T, Sure U. Loss of endothelial programmed cell death 10 activates glioblastoma cells and promotes tumor growth. Neuro Oncol. 2015 Aug 8. pii: nov155. [Epub ahead of print] PubMed PMID: 26254477.