Caveolin-1 expression as a possible biomarker in pancreatic cancer diagnosis

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INTRODUCTION

Caveolin1 (Cav-1) the structural protein of caveolae, is recognized as a key switch, functioning either as a tumor supressor or as a promoter of metastasis and tumor cell survival.

AIM

Our goal was to reveal the immunohistochemical expression of Cav-1 in different pancreatic tumors, in comparisson with Ki67 and p53, in order to evaluate their involvement in tumour agressivness.

MATERIALS & METHODS

We studied 12 pair samples (tumoral/peri-tumoral), harvested from patients with pancreatic cancer, that underwent surgical procedures.

The antibodies used for this project were:
IHC:
　　Ki67 – MIB-1, Dako, 1:50
　　p53 – D0-7, Biogenex, 1:100
　　Cav-1 – sc-894, Santa Cruz, 1:200
serum (ELFA)　　　　　　**(XMapArray)**
　　CEA – BioMerieux　　　　VEGF – Upstate
　　CA19-9 – BioMerieux　　　b-FGF – Upstate
western blot
　　Cav-1 - sc-894, Santa Cruz, 1:200
　　beta-actin - sc-47778 - Santa Cruz, 1:200

RESULTS

The labelling index for Ki67 was 20% in tumor tissue specimens, but around 3.5% in their matched peritumoral samples. Staining for p53 was positive in 66% of tumor samples and negative results in the peritumoral samples.

A positive expression of Cav-1 was associated with positivity for Ki67, p53 in tumor and endothelial cells (tumor tissue). By contrast, in peritumoral samples Cav-1 expression was confined to some endothelial cells.

Similar results were obtain using **Western Blot** in certain cases - Cav-1 selectively increases activities in tumor tissue/peritumoral.
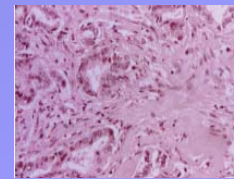
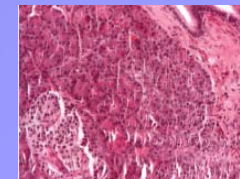**Figure 1.** Ductal pancreatic adenocarcinoma. HE, 10x

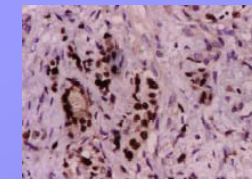**Figure 2.** Peritumoral pancreatic parenchyma. HE, 10x

Figure 3. Positive expression for Ki67 in frequent tumor cells (tumoral tissue). IHC, 20x
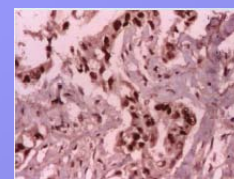
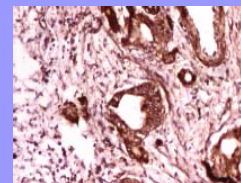**Figure 4.** Positive expression for p53 in frequent tumor cells (tumoral tissue). IHC, 20x

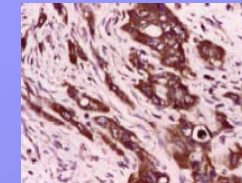**Figure 5.** Cav-1 positive in tumor cells and in smooth arterial muscular wall. IHC, 10x

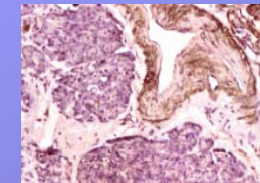**Figure 6.** Intense Cav-1 positivity in tumor cells (tumoral tissue) IHC, 20x

Figure 7. Cav-1 positive in blood vessels (smooth muscular cells) and in dispersed acinary cells (peritumoral tissue) IHC, 10x
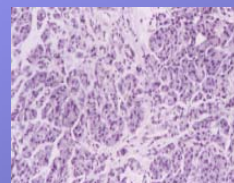
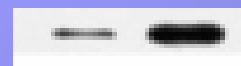**Figure 8.** Negative results for Cav-1 in cells from peritumoral samples IHC, 10x

peritumoral　　tumoral

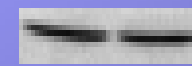**Figure 9.** Caveolin-1 activity .

Beta-actin

Figure 10. Control.

Serum level for tumoral markers was also increased in accordance with Cav-1 expression:
CA19.9 – avg. 109.18 UI/mL (*vs. 4.00 UI/mL normal*)
CEA – avg. 1.50 ng/mL (*vs. 0.83 ng/mL normal*)
bFGF – *avg. 13.27 pg/mL (vs. 5.3 pg/mL in ctrl group)*

CONCLUSIONS

• A positive corelation between the proliferative activity and overexpression of Cav-1, in concordance with tumoral grading were noted.

• Moreover, Cav-1 expression in tumors was in accordance with increased level of serum tumor markers (CEA, CA19.9) and angiogenic marker (VEGF, bFGF).

• Further research may settle if the clinical outcome can be predicted by measuring Cav-1 expression in pancreatic tumors.

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