

## Epithelial-to-mesenchymal transition in pancreas adenocarcinoma cells: effect of 2D versus 3D arrangement

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It was shown that three-dimensional (3D) cell cultures allow mimicking the functions of living tissues and provide pivotal information encoded in the tissue architecture [1]. Considered the primary role of epithelial-to-mesenchymal transition (EMT) in carcinoma progression [2], we aimed at investigating the effect of the 3D arrangement on the expression of some key markers of EMT in cultured human pancreas adenocarcinoma cells (PDAC). HPAC cells were cultured in both two-dimensional (2D) monolayers and in 3D spheroids, and were analyzed by morphological and molecular approaches. Immunofluorescence analysis for E-cadherin,  $\beta$ -catenin, actin, vimentin and collagen type I was performed on cells grown on 12 mm coverslips or on free-floating spheroids after 4% paraformaldehyde fixation. E-cadherin gene expression was assessed by real time PCR. Fluorescence and confocal microscopy analysis revealed that the E-cadherin/ $\beta$ -catenin complex was similarly expressed at the cell boundaries on the plasma membrane in 2D monolayers as well as in the 3D spheroids. Phalloidin-stained F-actin was mainly arranged into cortical actin filaments while vimentin was undetectable, suggesting an epithelial-like phenotype for HPAC cells in 2D and 3D arrangement. Interestingly, after 3D arrangement decreased E-cadherin mRNA levels and some cells expressing collagen type I were observed in spheroids. Our findings suggest that the 3D arrangement induced the expression of mesenchymal phenotype-related markers in HPAC cells, providing a model to better understand the biology of PDAC.

### References

- [1] Hirschhaeuser et al. (2010) Multicellular tumor spheroids: an underestimated tool is catching up again. *J Biotechnol* 148: 3-15.
- [2] Thiery JP, Sleeman JP (2006) Complex networks orchestrate epithelial-mesenchymal transitions. *Nat Rev Mol Cell Biol* 7: 131-142.

### Key words

Epithelial-to-mesenchymal transition, pancreas adenocarcinoma, spheroids, E-cadherin/ $\beta$ -catenin complex, vimentin.