

## Isolation and characterization of cancer stem cells in head and neck squamous cell carcinoma

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The hypothesis that a small subset of cells with characteristics of steminality is essential for the cancer onset has been widely studied in many tumors, included head-neck cancer, the seventh most common cancer in humans (1). These cells represent a small oncogenic subpopulation, with a characteristic phenotype that confers them a greater resistance to chemotherapy and radiotherapy (2). In this study the expression profile of some genes that differentiates cancer stem cells (CSC) from tumor cell of origin (TC) has been evaluated using Real Time PCR. Three cell lines, PE46, PE15 and HEP2, obtained from head and neck squamous cell carcinoma, were placed in culture, in absence of serum and in the presence of specific growth factors, giving rise to a spheroid cell subpopulation, with characteristics belonging to CSC. CSC were isolated using a selective filtration procedure based on beads labeled with the anti-CD44, that recognize a specific antigen of CSC in head and neck cancer (1). Few genes potentially involved in the onset and progression of oral cancer, were evaluated in Real Time PCR, in order to compare their expression in CSC respect TC. All the three cell lines showed a common expression profile among the stem cell markers, resulting in an overexpression of the CD44 and ALDH1A in the spheroid population. Many of the investigated tumor markers were highly over-expressed in CSC, like TNF $\alpha$ , a pro-inflammatory factor that inhibits precancerous cell death, TP63, which is associated with an increase in the malignant transformation and a poor prognosis, and S100A4, a pro-inflammatory mediator involved in epithelial-mesenchymal transition of cancer cells. These results suggest the potential role of CSC in the tumor invasiveness. The characterization of CSC may lead to an improvement in the diagnosis and cancer therapy, allowing implementing treatments able to destroy cells which are probably involved in the process of metastasis.

### References

- [1] Prince et al (2007) Identification of a subpopulation of cells with cancer stem cell properties in head and neck squamous cell carcinoma. *Proc Natl Acad Sci U S A* 104: 973-978;
- [2] Prince et al (2007) Identification of a subpopulation of cells with cancer stem cell properties in head and neck squamous cell carcinoma. *Proc Natl Acad Sci U S A* 104: 973-978.

### Keywords

Cancer stem cells; head and neck cancer; gene expression.