Studying the level of PSMA expression in prostate cancer
Untersuchung der Spiegel vom PSMA expression im Prostata Karzinome

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INTRODUCTION

Prostate cancer is the most common cancer and the second leading cause of cancer-related death among men. New therapeutic models are needed to increase diagnostic and prognostic effectiveness. Until now, prostate specific membrane antigen (PSMA) was a widely used prognostic marker. PSMA is a transmembrane carboxypeptidase and exhibits folate hydrolase activity. This protein is overexpressed in prostate cancer tissues and is associated with a higher Gleason score. Researchers suggest that the cause of prostate cancer relapses is a small population of cells called cancer stem cells. The present study attempts to find if there is a correlation between PSMA's expression and prostate cancer stem cells.

MATERIALS AND METHODS

Two methods have been used in order to prove the above assumption. The first panel of the test included Reverse Transcription and Real- time PCR assays with PSMA-specific primers and the second panel a flow cytometric protocol by using an anti-PSMA antibody. In order this experiment to be performed, circulating tumor cells from patients who suffered from prostate carcinoma were isolated and cultivated.

REFERENCES

• Lang, S. H., Frame, F. M. & Collins, A. T. Prostate cancer stem cells. J Pathol 217, 299-306, doi:10.1002/path.2478 (2009).
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RESULTS

From the experiments that were performed, it was found that in the two different populations of cancer cells (see table 2), there was also a difference in PSMA gene and protein expression. According to the flow cytometric analysis, LNCaP prostate cancer cell line expressed PSMA up to 93% in comparison with the prostate CSCs which were isolated from a prostate cancer patient, and expressed PSMA only 0.22% which tended to zero (see tables 1 & 3).
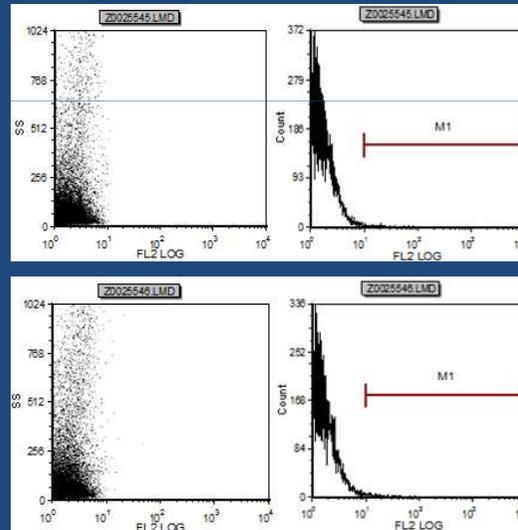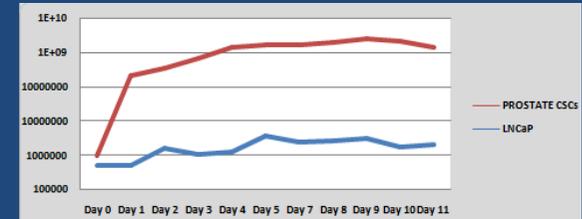

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 7	Day 8	Day 9	Day 10	Day 11
LNCaP	5x10⁵	5x10⁵	16,2x10⁵	11x10⁵	12,9x10⁵	37,5x10⁵	2,4x10⁶	2,7x10⁶	3x10⁷	1,8x10⁶	2,1x10⁶
PROSTATE CSCs	5x10⁵	21,3x10⁷	35,6x10⁷	68x10⁷	142,5107	158,9x10⁷	169x10⁷	188,6x10⁷	244,8x10⁷	213,6x10⁷	139,2x10⁷

Table 2. Growth curve analysis for LNCaP cell line in comparison with prostate CSCs

Table 1. Flow cytometric results for prostate CSCs by using anti-PSMA antibody
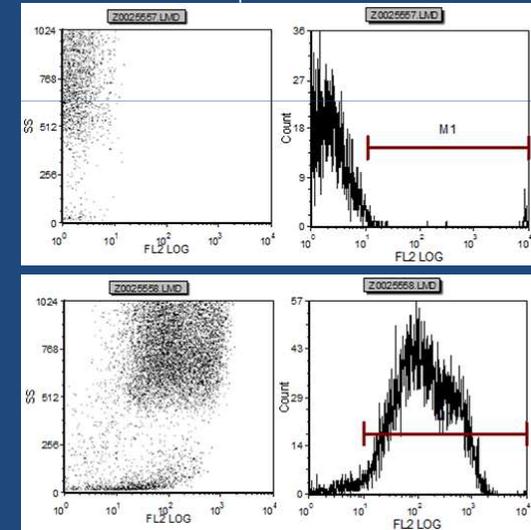

Table 3. Flow cytometric results for LNCaP cell line by using anti-PSMA antibody

CONCLUSION

It this particular case, although PSMA was expressed in prostate cancer cell lines, the absence of it may be a prognostic marker concerning prostate CSCs because its expression level was low. Further studies need to be conducted in order to prove the above model.