

## **Tumor Infiltrating Lymphocytes from human prostate tumors reveal anti-tumor reactivity and potential for adoptive cell therapy**

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**Background:** Advanced prostate cancer remains incurable and is the second leading cause of mortality in men. Immunotherapy based on the adoptive transfer of tumor-infiltrating lymphocytes (TIL) has demonstrated promising clinical results in patients with metastatic melanoma and lately also in other solid tumors. However, the ability to obtain TIL from patients with prostate cancer, considered poorly immunogenic, remains unknown.

**Methods:** In this study, we investigate the feasibility of isolating and expanding TIL from primary prostate tumors. We collected tumor specimens from eight patients with diagnosed prostate adenocarcinoma undergoing radical prostatectomy

**Results:** We were able to successfully expand multiple autologous TIL cultures from all eight patients. 28 prostate-TIL cultures were further expanded using a standard rapid expansion procedure under Good Manufacturing Practice conditions. TIL cultures were phenotypically characterized for T cell subset composition, differentiation status and co-inhibitory / stimulatory markers such as PD-1, TIM-3, LAG-3 and CD28 and were found to have in general similarity to TIL obtained from patients with melanoma and lung carcinoma previously treated at our center. All analyzed TIL cultures were functional as determined by the capability to produce high level of IFN $\gamma$  upon stimuli. Most importantly, co-culture assays of prostate-TIL with autologous tumors demonstrated anti-tumor reactivity.

**Conclusions:** These findings demonstrate that functional and anti-tumor reactive TIL can be obtained, despite the immunosuppressive microenvironment of the cancer, thus this study supports the development of TIL therapy for prostate cancer patients.

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