Infiltrating Mesenchymal Stem Cells as Cell-based Vectors for Prostate Cancer

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Abstract: Mesenchymal Stem Cells (MSCs) have been identified in prostate cancer, raising the critical question of their source. Therefore, MSCs were characterized in benign and malignant prostate tissue representing different disease states from fetal development through adult death using analytical and functional methodologies. In contrast to lineage-restricted Mesenchymal Progenitor Cells (MPCs) found in normal tissue, MSCs with tri-lineage differentiation potential (adipogenesis, osteogenesis, and chondrogenesis) are identified in prostate cancer patients, consistent with an influx of MSCs from the bone marrow. Tissue from a subset of primary prostate cancer patients is highly enriched in MSCs, suggesting potential prognostic value. Furthermore, this recruitment is an ongoing process as documented by the presence of MSCs in metastatic lesions from castration-resistant prostate cancer patients, which provides the rationale for a cell-based vector to deliver therapeutic agents. Critically, a Phase 0 clinical trial has demonstrated allogeneic MSCs can be safely given to men with prostate cancer.

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