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Cancer stem cells as a therapeutic target in bladder cancer.

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Abstract

Bladder cancer is one of the most prevalent genitourinary cancers responsible for about 150,000 deaths per year worldwide. Currently, several treatments, such as endoscopic and open surgery, appended by local or systemic immunotherapy, chemotherapy, and radiotherapy are used to treat this malignancy. However, the differences in treatment outcome among patients suffering from bladder cancer are considered as one of the important challenges. In recent years, cancer stem cells, representing a population of undifferentiated cells with stem-cell like properties, have been eyed as a major culprit for the high recurrence rate in superficial papillary bladder cancer. Cancer stem cells have been reported to be resistant to conventional treatments, such as chemotherapy, radiation, and immunotherapy, which induce selective pressure on tumoral populations resulting in selection and growth of the resistant cells. Therefore, targeting the therapeutic aspects of cancer stem cells in bladder cancer may be promising. In this study, we briefly discuss the biology of bladder cancer and then address the possible relationship between molecular biology of bladder cancer and cancer stem cells. Subsequently, the mechanisms of resistance applied by cancer stem cells against the conventional therapeutic tools, especially chemotherapy, are discussed. Moreover, by emphasizing the biomarkers described for cancer stem cells in bladder cancer, we have provided, described, and proposed targets on cancer stem cells for therapeutic interventions and, finally, reviewed some immunotargeting strategies against bladder cancer stem cells.

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KEYWORDS: cancer stem cells; drug resistance; immunotherapy; transitional cell carcinoma; urinary bladder neoplasms

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