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Identification of melanoma stem cells

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Abstract

Background: So far, the majority of the stem cell studies have been confined to human tumors in immunosuppressed hosts which are not suitable for immunologic evaluation.

Aim: To identify cancer stem cell (CSC)-enriched populations in a murine melanoma tumor in syngeneic immunocompetent host, and in human melanoma cells.

Methods: Isolation of stem cell-enriched populations from melanoma using ALDEFLUOR/ALDH as a marker.

Results: A very small percentage (<5%) of ALDEFLUOR^{+}/ALDH^{high} cells exist in D5 murine melanoma tumors. Sorted and as few as 500 ALDEFLUOR^{+}/ALDH^{high} cells could form tumors in the syngeneic hosts, while equal and much larger numbers of ALDEFLUOR^{-}/ALDH^{low} cells could not. The stem cell nature of the ALDELFUOR^{+}/ALDH^{high} cells was confirmed by their ability to form spheres in culture and to self-renew *in-vivo*. More recently, we detected ALDEFLUOR^{+}/ALDH^{high} cells from two cell lines established from human melanoma. These ALDEFLUOR^{+}/ALDH^{high} cells formed tumor when injected into SCID mice. However, equal number of ALDEFLUOR^{-}/ALDHl^{ow} cells did not, demonstrating significantly distinct tumorigenicity of the two populations.

Conclusion: We have identified CSC-enriched populations in a syngeneic immunocompetent murine model (D5), as well as from two cell lines established from human melanoma. These allow us to evaluate CSC-induced antitumor immunity by selectively targeting melanoma cancer stem cells.

Biography

Qiao Li, Ph.D. is a Research Assistant Professor at the University of Michigan and has long been involved in research on tumor immunology and cancer immunotherapy. He has published extensively in preclinical studies and in clinical trials utilizing various immune strategies, such as T cells, B cells, and dendritic cells as well as targeting of cancer stem cells.