Eradicating Cancer Stem Cells Using High Linear Energy Transfer Radiation Therapy Part 2: LET Painting and Other Advanced Techniques

Description

The authors describe advanced high linear energy transfer (LET) techniques, including LET painting, biologically guided spatial fractionation, and multi-ion therapy, as potential methods to selectively ablate cancer stem cells while sparing normal tissue. The article highlights recent imaging advances that could help define high-risk tumor subvolumes and outlines logistical and clinical challenges to widespread implementation, making a compelling case for heavy particle therapy as a means of augmenting systemic cancer control.

Learning Objectives

Upon completing this activity:

- Clinicians will be able to discuss the principles of LET painting and multi-ion heavy particle therapy as emerging strategies to selectively target cancer stem cell–rich tumor subvolumes.
- Clinicians will be prepared to utilize functional imaging modalities to target both hypoxia and the underlying biological properties of cancer stem cells.
- Clinicians will be able to incorporate PATHY and grid/lattice spatial fractionation techniques into clinical practice while understanding the relative advantages and disadvantages of each approach.

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Target Audience

- Radiation oncologists
- Related oncology professionals

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