

POSTER PRESENTATION

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Radiation therapy and vaccination against tumor-specific EGFRvIII effectively clears tumors in a murine model of head and neck squamous cell carcinoma

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EGFRvIII is a constitutively active and tumor-specific deletional mutant of EGFR found in multiple tumor types including glioblastoma multiforme, and has been reported in head and neck squamous cell carcinomas (HNSCC). The deletion of *EGFR* exons 2-7 results in a novel glycine at the junction and yields a tumor-specific antigen with demonstrated immunogenicity in mice and humans. Using a live-attenuated *Listeria monocytogenes*-based vaccine expressing a 21-AA neo-peptide from EGFRvIII (LmEGFRvIII), we demonstrated that prophylactic vaccination protects against subsequent challenge with an EGFRvIII-expressing squamous cell carcinoma (SCCVII-EGFRvIII). Similarly, therapeutic vaccination three days post-implantation prevented outgrowth of EGFRvIII-expressing tumors but not parental EGFRvIII-negative tumors. Conversely, we found that LmEGFRvIII vaccination was insufficient to clear large established SCCVII-EGFRvIII tumors despite eliciting large numbers of polyfunctional EGFRvIII-specific CD8⁺ T cells. We hypothesized that localized inflammation elicited by radiation therapy could recruit EGFRvIII-specific CD8⁺ T cells into the tumor. We demonstrated that while neither LmEGFRvIII vaccination nor radiation therapy alone were able to control the EGFRvIII-expressing tumors, the combination of LmEGFRvIII and radiation therapy led to tumor regression and durable cures. We are currently exploring the potential mechanisms for their synergy including the role of T cell recruitment, survival and epitope spreading.

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