Transcript Details
This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: https://reachmd.com/programs/project-oncology/head-neck-squamous-cell-carcinoma-radioresistance-drivers/70418/

ReachMD
www.reachmd.com
info@reachmd.com
(866) 423-7849

Key Drivers of Radioresistance in Head and Neck Squamous Cell Carcinoma

Announcer:
Welcome to *Project Oncology* on ReachMD. On this episode, we'll hear from Dr. Heath Skinner, who's a Professor and Chair of Radiation Oncology at the University of Pittsburgh School of Medicine. He'll be discussing the factors that influence radiation sensitivity and resistance in head and neck squamous cell carcinoma. Here's Dr. Skinner now.

Dr. Skinner:
So there are a few different things that play into why some head and neck squamous cell carcinomas are better responders to radiation than others. And there are a few key known quantities.

More recently, within the past one to two decades, we've found that human papillomavirus, or HPV, is specifically associated with certain types of head and neck squamous cell carcinomas, particularly those that arise in the oropharynx. And the oropharynx is basically the tonsil and the base of tongue. And those tumors are more often than not very distinct from more classical head and neck squamous cell carcinomas, which are more commonly associated with consumption of alcohol and/or smoking. So we know that human papillomavirus tumors are far more sensitive, in most cases, to radiation than their non-HPV-associated counterparts. And that is the most powerful driver for sensitivity or resistance to radiation in head and neck cancer.

So it's difficult to predict which tumor is going to respond to radiation and which won't for a few different reasons. Firstly, we know that the presence of HPV is associated with a far greater sensitivity to radiation, but that's taken in aggregate. So there are some HPV-driven tumors that remain resistant to radiation. Moreover, there are some HPV-negative tumors that are quite sensitive to radiation.

It's hard to predict because solid tumors, in general, are heterogeneous. They have acquired over the course of their development a lot of intracellular changes, and some of those intracellular changes are associated with resistance to radiation. And it's not only the intracellular portion that drives radioresistance; it's also the tumor mass itself and the tumor microenvironment. So you can have a tumor that has large areas of low levels of oxygen, and that is associated with resistance to radiation. You can have areas of the tumor mass that have low levels of perfusion, which often coincide with hypoxia, and those areas are likely resistant to radiation. Additionally, you can have a tumor microenvironment that makes it challenging for effector immune cells to enter into the tumor, and that can key into radioresistance.

So you have all of these processes going on simultaneously and in a dynamic way. Tumors get bigger, the 3D environment changes, and it's all a heterogeneous mass of tumor that just sadly doesn't follow a great deal of logic. So you have multiple different things keying into one another to drive response to radiation that is dynamic over time.

Announcer:
That was Dr. Heath Skinner talking about the factors that influence radiation sensitivity and resistance in head and neck squamous cell carcinoma. To access this and other episodes in our series, visit *Project Oncology* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

© 2026 ReachMD