



# Radiobiological Targeting Role in Precision Radiation Medicine

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## Commentary

Oncology precision medicine was developed in the last decades, utilizing new technology tools and genetics evolution to use more personalized decision making in patient diagnosis, treatment, and follow-up. Understanding the pathways for tumor growth, death resistance and spread [1] formed an opportunity in targeting these tracks to offer better tumor control, limit disease spread overcome treatment resistance. For allocating these pathways; genetics testing [2], functional and molecular imaging [3] provides various information to assist in this selection. The core of radiobiological targeting in personalized oncology is subgrouping patient according to specific genetic characteristics and biomarkers for individualized treatment instead of standardizing the treatment for patients with same anatomical tumor site no matter the difference in the molecular, functional or genetic testing [4].

Radiation therapy (RT) is considered major treatment modality for cancer which targets the DNA at the cancer cell level. Combining RT with selectively targeted agents based on personalized assessment result has the potential to improve outcomes by working on various targets enhancing the radiation sensitivity of tumor [5] or by working as radiation protector on normal tissue [6]. Different studies reported the effect of combining targeted agents with radiation therapy [7]. Challenges are that most targeted agent offer only limited inhibition of signaling pathway and many are very toxic to be used concurrently. Also, in vitro result does not always reflect in similar clinical outcomes, this could be related to tumor evolution and intra-tumor heterogeneity. Moreover, biomedical targeting research frequently requires high cost and a long time in to be established [8].

Smart selection of patients based on the genetics analysis for randomized clinical trials is the choice we have to continue on the right track. Having detailed discussions with our patients and their families about clinical trials including their rationale and expected effects to encourage further enrollment will keep the wheel running to provide future results for targeted agents in cancer therapy and, finally, lead to a better selection of RT volume, dose, and fractionation.

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