**Docket #:** S20-053

# Combined radiotherapy and macrophage-targeted immunotherapy of cancer to elicit abscopal responses

Radiation is often an effective treatment modality for cancer, but its effects are limited to the targets that are directly irradiated. Regions of tumor outside the radiation field do not experience direct radiation-induced DNA damage and cellular apoptosis. Thus, there is a need for a robust off-target (abscopal) effect of radiation. Stanford inventors have combined radiotherapy with antibodies to develop a novel method of inducing abscopal responses for unirradiated tumors. The technique uses radiotherapy in combination with a CD47 blocking agent, which blocks don't-eat-me signals on cancer cells and activates the host's macrophages. Leveraging the strong inflammatory reaction produced by radiation enables repurposing of radiation-induced macrophages to exert an antitumor effect. Successful in vivo studies within small animals demonstrated the effectiveness of the method in enhancing the effects of radiation at the irradiated site but also in inducing abscopal responses, both in immunodeficient and immunocompetent hosts. A combined radiation and anti-CD47 treatment will be a valuable tool within chemotherapy to target off-target tumors, all by leveraging the host's own immune system.

## Applications

- Chemotherapy
- Immunotherapy
- Radiation therapy

## Advantages

- Targets irradiated tumors
- High success in inducing abscopal response compared to previous clinical studies
- Does not require a functional immune system and successful within immunodeficient and immunocompetent hosts

## Publications


- Nishiga, Y., Drainas, A.P., Baron, M. et al. Radiotherapy in combination with CD47 blockade elicits a macrophage-mediated abscopal effect. Nat Cancer 3, 1351–1366 (2022).


## Patents

- Published Application: 20240034788

## Innovators

- Julien Sage
- Edward Graves
- Yoko Nishiga

## Licensing Contact


### Chu Chang

Licensing Manager, Life Sciences

Email