

Identifying a novel target for cancer immunotherapy

12 April 2017, by Anna Williams

Targeting a molecule called B7-H4—which blocks T cells from destroying tumor cells—could lead to the development of new therapies that boost the immune system's ability to fight cancer, according to a review published in the journal *Immunological Reviews*.

"Targeting B7-H4 itself, or in combination with the current therapies, may lead to more effective treatments for a variety of cancers," said Stephen Miller, PhD, the Judy Gugenheim Research Professor of Microbiology-Immunology and of Dermatology, the lead author of the paper. Joseph Podojil, PhD, research associate professor of Microbiology-Immunology, was the first author.

Immunotherapy is a type of [cancer](#) treatment that stimulates the patient's own immune system to attack [cancer cells](#). One immunotherapy approach involves targeting a group of proteins, called immune checkpoints, that normally prevents the immune system from attacking tumor [cells](#). By employing antibodies that specifically block the checkpoints, these drugs unlock the "breaks" on the immune system, freeing T-cells to detect and destroy [tumor cells](#).

"Cancer therapy has recently been revolutionized with this approach," said Miller, also director of the Interdepartmental Immunobiology Center.

"However, the two checkpoint-inhibitor blockers currently used only work in a minority of patients with a particular cancer, and not at all in other forms. Additional checkpoint inhibitors need to be identified and blocked in order to enhance the therapeutic response rate in [cancer immunotherapy](#)."

In the review, Miller and Podojil highlight the potential of targeting B7-H4, a more recently discovered immune-inhibitory protein.

Miller's lab had previously studied B7-H4—and the mechanisms by which it thwarts the immune

response—in the context of a treatment for multiple sclerosis, an autoimmune disease. Other research has also shown that B7-H4 is overexpressed in many types of tumors, and high levels are linked to adverse outcomes in cancer patients.

While blocking B7-H4 has not yet been clinically tested—and its actual effectiveness in [cancer treatment](#) is not yet known—the authors note that much of the existing data point to B7-H4 as a promising target for new immunotherapies that may treat a wider range of cancers.

More information: Joseph R. Podojil et al. Potential targeting of B7-H4 for the treatment of cancer, *Immunological Reviews* (2017). DOI: [10.1111/imr.12530](https://doi.org/10.1111/imr.12530)

Provided by Northwestern University

APA citation: Identifying a novel target for cancer immunotherapy (2017, April 12) retrieved 29 April 2021 from <https://medicalxpress.com/news/2017-04-cancer-immunotherapy.html>

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