Spotlight

By Caroline Seydel

A New Peptide Target for Immunotherapy

Coleman *et al*.
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Tumor immunologists are searching tirelessly for a way to use cytotoxic T cells against cancer. What they're looking for is an antigen associated with tumors -- but not with normal tissues -- that can mobilize the T cells. Coleman *et al*. identified promising peptides from a nuclear protein found in breast cancer cells and successfully demonstrated that they could indeed get the attention of the T cells.

The ideal antigen for cancer immunotherapy should be specific for cancer cells. First, a peptide that occurs frequently on normal cells would not stimulate much of an immune response due to self-tolerance and, second, any attack on cancer cells that targets a commonly occurring antigen would have major side effects. The researchers examined a protein, JARID1B, which is found in breast cancer cells but not in normal adult tissues and is also expressed more in higher grade, more aggressive tumors. They applied two peptide-prediction algorithms to identify peptides that would likely incite a response from T cells. Once they had peptides in hand, they looked at how well each peptide stimulated T cells *in vitro*, and then tested whether cells expressing the peptides induced a T cell response.

Although the peptides did induce T cells *in vitro*, the expression level on the cell surface was too low to induce the T cell response when not pulsed with peptide. The authors did, however, find high levels of JARID1B-reactive T cells in the circulation of breast cancer patients, indicating that the patients' immune cells had previously been exposed to the peptides. Creating a combination of peptides from JARID1B and other cancer-associated antigens, then, could be a promising avenue of investigation for future immunotherapy.