Spotlight

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One vaccine, many tumors

Srivastava *et al*.
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Non-small cell lung cancer (NSCLC), which accounts for some 75% of all lung cancers, consists of three distinct subtypes. Srivastava, *et al.* sought to develop a vaccine that would energize an immune response to cancers of any of the three subtypes. Since all three originate from the same progenitor cells, it seemed possible. Indeed, the team discovered that vaccines prepared from one subtype could fire up T cells to go after any of the three subtypes, but not normal lung cells or non-lung tumor cells.

The three NSCLC subtypes require different treatments, so accurate diagnosis is key, but often tumors are heterogeneous or not easily classified. Immunotherapy could skirt this problem if a single vaccine could combat multiple cell subtypes. Srivastava *et al.* undertook to enlist helper T cells (CD4+ T cells) using a cell-based approach called an MHC II vaccine. The genetically modified tumor cells used in the vaccine will, in theory, present peptides to the helper T cells that the body's own immune cells don't. And, in fact, studies using an MHC II breast cancer vaccine have confirmed this concept. In mice with various cancers, MHC II vaccines promoted tumor rejection and increased survival.

In this study, the authors created MHC II NSCLC vaccines from cells of each of the three main NSCLC subtypes, and each vaccine reacted with all three NSCLC subtypes, demonstrating that they share tumor antigens. These vaccines, designed to stimulate tumor cell-killing T cells (CD8+ T cells) and promote immune memory, may prove useful in preventing tumors from reemerging from latent tumor cells.