Personalized therapeutic cancer vaccine development to treat metastatic diseases

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Our laboratory has pioneered the development of a therapeutic cancer vaccine design that uses a novel protein transfer technology. Using this approach it is feasible to develop cancer vaccines from surgically removed tumor tissues. In this technology, immunostimulatory molecules are attached to a glycolipid and then tethered to tumor membranes by a short-incubation, thus eliminating the need for gene transfer or live cells to develop cancer vaccines. The immunostimulatory molecules incorporated onto tumor membranes serve as adjuvants to boost antitumor immunity against tumor-associated antigens expressed on cancer cell membranes. Experiments using mouse models of cancers have shown that membrane-based cancer vaccines prepared by protein transfer technology can protect mice from live tumor cell challenge suggesting that membrane-based cancer vaccines induce protective antitumor immunity. This personalized therapeutic vaccine approach has the potential to treat metastatic cancers in an adjuvant setting where the target antigen is yet to be identified.

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