New vaccine for renal cell carcinoma found to increase survival rates

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(Medical Xpress) -- Researchers working for German pharmaceutical company Immatics Biotechnologies GmbH, have outlined two successful outcomes for their multipeptide vaccine IMA901 in a paper they've had published in the journal *Nature Medicine*. In it they describe how renal cell carcinoma (RCC) patients vaccinated with IMA901 experienced longer survival rates and how they've also discovered key markers that they believe indicate which patients are most likely to benefit from the vaccine.

RCC, also known as hypernephroma, is the most common type of kidney cancer and survival rates for those who get it are low if the cancer metastases. Current treatment usually means removal of the cancerous tissue along with various forms of immunotherapy as radiation and chemotherapy are generally ineffective. Immunotherapy involves administering drugs that help the body identify cancerous cells as something that needs to be attacked and killed. To date, unfortunately, progress in this area of medicine has been slow, thus, the news that the vaccine developed my Immatics is showing some success is generating excitement in the cancer research world.

RCC vaccines are therapeutic, not preventative, hence they are only administered to people who have already been diagnosed. IMA901 was developed by noting the different antigens that come to exist on or around tumors as a result of the growth of cancerous cells under certain circumstances. The vaccine is made up of ten peptides that the research team has found cause stimulation of the immune system in patients that

express the antigens they've noted. That in turn causes the immune system to go on alert and to attack the tumors and hopefully kill them in the process.

IMA901 has currently gone through phase 1 and 2 clinical trials and is currently in phase 3. In the first two phases, the team found longer survival rates for the patients who volunteered to take part in the testing. Survival rates for those who undergo current treatment therapies are typically sixty to seventy percent for five years.

The team also detailed two serum biomarkers they've discovered that they believe signal which RCC patients would be the most likely to benefit from IMA901, though they note that they won't know for sure how accurate they are until completion of phase 3 of their clinical trials.

More information: Multipeptide immune response to cancer vaccine IMA901 after single-dose cyclophosphamide associates with longer patient survival, *Nature Medicine* (2012) doi:10.1038/nm.2883

Abstract
IMA901 is the first therapeutic vaccine for renal cell cancer (RCC) consisting of multiple tumor-associated peptides (TUMAPs) confirmed to be naturally presented in human cancer tissue. We treated a total of 96 human leukocyte antigen A (HLA-A)*02+ subjects with advanced RCC with IMA901 in two consecutive studies. In the phase 1 study, the T cell responses of the patients to multiple TUMAPs were associated with better disease control and lower numbers of prevaccine forkhead box P3 (FOXP3)+ regulatory T (Treg) cells. The randomized phase 2 trial showed that a single dose of cyclophosphamide reduced the number of Treg cells and confirmed that immune responses to multiple TUMAPs were associated with longer overall survival. Furthermore, among six predefined populations of myeloid-derived suppressor cells, two were prognostic for overall survival, and among over 300 serum biomarkers,

we identified apolipoprotein A-I (APOA1) and chemokine (C-C motif) ligand 17 (CCL17) as being predictive for both immune response to IMA901 and overall survival. A randomized phase 3 study to determine the clinical benefit of treatment with IMA901 is ongoing.