HUMAN VACCINES & IMMUNOTHERAPEUTICS
2022, VOL. 18, NO. 7, e2155378 (2 pages)
https://doi.org/10.1080/21645515.2022.2155378

Taylor & Francis
Taylor & Francis Group

NEWS, POLICY, & PROFILES

OPEN ACCESS Check for updates

# Human vaccines & immunotherapeutics: News November 2022

## Cervical cancer vaccine induces 100% response rate in a small trial

Eight complete responses and one >60% tumor reduction were seen in nine patients with locally advanced cervical cancer following treatment with the cancer vaccine PDS0101 (PDS Biotech) in combination with standard-of-care chemoradiotherapy. The Phase 2 IMMUNOCERV trial reported activation of HPV16-specific cytotoxic T cells in all tested patients.

PDS0101 is a nanoparticle lipid vaccine targeting HPV strain 16 antigens that are present in several cancer types induced by HPV infection.

## Covid-19 vaccines continue to be effective against emerging strains

An Omicron-adapted bivalent formulation of the mRNA vaccine mRNA-1273 (Spikevax, Moderna) elicited high neutralizing antibody levels in 500 adults enrolled in a Phase 2/3 trial. The titers were also specific to an emerging variant BQ.1.1, as tested in a subset of 40 participants. This vaccine formulation was given conditional authorization by the US Food and Drug Administration in summer 2022.

The EU's Committee for Medicinal Products for Human Use recommended approval of an Omicron-specific bivalent formulation of another widely used mRNA vaccine, BNT162b2 (Comirnaty, Pfizer & BioNTech), for use in children 5–11 years old.

The European Medicines Agency approved the adjuvanted, recombinant protein vaccine VidPrevtyn Beta (GSK & Sanofi) as a booster dose in adults. The decision is based on data showing protection from multiple SARS-CoV-2 variants in people who had been previously vaccinated with mRNA or adenoviral vaccines.

Two doses of an adjuvanted, nanoliposome-delivered recombinant peptide vaccine, EuCorVac-19 (POP Bio), were safe and induced neutralizing antibodies in 230 healthy adults involved in a dose-escalation, placebo-controlled Phase 2 trial.[1] The vaccine is being tested in two Phase 3 trials.

## Immunotherapeutic approved to delay progression of type-1 diabetes

The FDA has authorized the CD3-specific MAb teplizumab (Tzield, Provention Bio) for subjects 8 years of age and older with stage 2 type-1 diabetes. Clinical trials reported the delayed disease progression to stage 3 by 25 months compared to placebo.

Teplizumab, which is administered intravenously in 14 daily doses, is the first approved therapy designed to delay juvenile diabetes. ~30,000 patients are eligible in the US alone.

## New immunotherapy options on the horizon for NSCLC patients

The combination of anti-PD-L1 durvalumab (Imfinzi), anti-CTLA-4 tremelimumab (Imjudo, both AstraZeneca) and platinum chemotherapy has been approved by FDA for the treatment of metastatic non-small cell lung cancer (NSCLC). The regimen improved the two-year survival rate to 33%, compared to 22% for chemotherapy, in the Phase 3 POSEIDON trial.

The PD-1 inhibitor dostarlimab (Jemperli, GSK) with chemotherapy-reduced tumor burden in 46% of metastatic non-squamous NSCLC patients, compared to 37% for pembrolizumab (Keytruda, Merck) in the same setting. Pembrolizumab is marketed as the first-line treatment for this indication. The Phase 2 PERLA trial reported 1.7% and 2.5% complete responses in the experimental and control group, respectively.

## WHO warns of measles spread in children

Forty million children worldwide are susceptible to measles infection according to the World Health Organization (WHO). Fifteen million missed the second vaccine dose, while 25 million were not vaccinated at all. There were 9 million cases and 130,000 deaths due to measles in 2021, and vaccine acceptance has been in steady decline in the last years, especially since the start of the Covid-19 pandemic.

WHO has called for a global, coordinated action to increase vaccination rates. ~95% completion rate is believed to be necessary for herd immunity and prevention of outbreaks.

## Personalized DNA immunotherapy promising in early trial

The personalized cancer vaccine EVX-02 (Evaxion) in combination with a checkpoint inhibitor monoclonal antibody was safe and immunogenic in a Phase 1/2 trial with resected melanoma patients. The regimen induced long-lasting CD4+ and CD8+ T-cell responses.

EVX-02 is formulated based on genome sequencing of the tumor tissue from each patient and artificial intelligence-assisted identification of neoantigens selected as the vaccine epitopes.

## CD40 agonist beneficial for melanoma patients

The CD40 agonist sotigalimab (Apexigen) combined with pembrolizumab was safe with a hint of clinical benefits as the first-line treatment of metastatic melanoma. A dose-finding Phase 1/2 trial reported overall response rate of 50% at the optimal dose, compared to 34% for the standard-of-care pembrolizumab alone.

Sotigalimab, which is administered intratumorally, is designed to stimulate antitumor T cells by activating CD40 surface protein present on antigen-presenting cells.

## CRISPR-engineered T-cell immunotherapy is feasible for treatment of solid tumors

The personalized engineered autologous T-cell immunotherapy NeoTCR-P1 (PACT Pharma) was safe in a proof-of-concept Phase 1 trial involving 16 patients with refractory solid cancers.[2] The transgenic T cells were stable and trafficked to the tumor sites, and five subjects reported stable disease.

In the procedure, T-cell receptors from a patient's own cells are edited using CRISPR technology to recognize neoepitopes specific for the subject's tumor, expanded in vitro and reinfused into the bloodstream.

## Chikungunya vaccine safe and immunogenic in mid-stage trial

The adjuvanted virus-like particle chikungunya vaccine CHIKV VLP (Emergent BioSolutions) was well tolerated and immunogenic in all 60 healthy adult participants of a Phase 2 trial, which tested both vaccine-naïve subjects and those who previously received Venezuelan equine encephalitis vaccine.

The mosquito-borne chikungunya virus has recently spread from tropical regions to countries in the Northern Hemisphere. Symptoms of infection include rash and joint pain.

## Virotherapy of glioma was safe in early trial

The oncolytic virotherapy CAN-3110 (Candel Therapeutics) demonstrated safety with no dose-limiting toxicities in 41 patients with recurrent high-grade glioma. Median overall survival reached >11 months with one complete response.

CAN-3110 consists of engineered herpes simplex virus, whose replication is controlled by the tumor-specific Nestin promoter.

## References

1. Lovell JF, Baik YO, Choi SK, Lee C, Lee JY, Miura K, Huang WC, Park YS, Woo SJ, Seo SH, et al. Interim analysis from a phase 2 randomized trial of EuCorvac-19: a recombinant protein SARS-CoV-2 RBD nanoliposome vaccine. BMC Med. 2022;20(1):462. doi:10.1186/s12916-022-02661-1.
2. Foy SP, Jacoby K, Bota DA, Hunter T, Pan Z, Stawiski E, Ma Y, Lu W, Peng S, Wang CL, et al. Non-viral precision T cell receptor replacement for personalized cell therapy. Nature. 2022. doi:10.1038/s41586-022-05531-1.

Ronald Ellis, PhD, MBA
*Editor-in-Chief, Biotech & Biopharma, Jerusalem, Israel*

Adam Weiss, PhD
*Acquisitions Editor, Taylor & Francis Group*