

CimaVax-EGF

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CimaVax-EGF is a vaccine used to treat cancer, specifically non-small-cell lung carcinoma (NSCLC).^[1]

The vaccine was the result of a 25-year research project at Cuba's Center of Molecular Immunology.^{[2][3]} There are agreements in place to test it in the United States (at Roswell Park Cancer Institute), Japan, and some European countries.^[4] It is currently available in Cuba, Colombia, Peru and Paraguay.^[5] In October 2015 Serbian Institute of Virology Torlak signed memorandum for a full medical treatment of 30 patients that will be part of a clinical study.^[6] CimaVax is relatively cheap to produce and store, and has low toxicity.^[4] Side effects of the vaccine appear to be mild, and include chills, fever, and feeling sick.^{[7][8]}

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Mechanism

CimaVax is an active vaccine in which patients are immunized with epidermal growth factor (EGF), thus raising antibodies targeting EGF itself. The product is also formulated with the *Neisseria meningitidis* outer protein P64k and Montanide ISA 51 as an adjuvant to potentiate the immune response.^[8] The epidermal growth factor receptor (EGFR) is hijacked by many types of cancer, including cancers of the lung, colon, kidney, and head and neck. By raising antibodies against EGF, which is EGFR's major ligand, the concentrations of EGF in the blood are reduced. Thus CimaVax does not target the cancer cells directly, but is expected to work against these cancers by denying the cancers the growth stimulus they require.^{[8][9]} For this reason, the Roswell Park group thinks that it may prove most useful as a *preventive* vaccine rather than as a cancer therapy *per se*.^[4]

Research

Cuba

Early trials showed a statistical trend towards an improved survival rate amongst vaccinated test subjects.^{[8][10]} A direct correlation between the level of antibodies that a vaccinated patient raises against EGF and survival has been observed in several trials,^[8] and in one of the largest trials^[9] there was also an age-dependence, with only subjects under the age of 60 benefiting in terms of survival.^[8] More antibodies are raised when the vaccine is formulated with Montanide ISA 51 rather than aluminum hydroxide as an adjuvant, and when patients receive a low dose of cyclophosphamide three days before vaccine administration.^[8] Cyclophosphamide is thought to temporarily block the body's natural immune tolerance to EGF, thereby increasing antibody titers.^[8]

Researchers caution that the early results to date have been in relatively small, early-stage trials with patients that were carefully selected based on predefined inclusion and exclusion criteria, and given specialized oncology care; they may therefore not be representative of most patients who might benefit from the vaccine.^[8]

It has been urged that CimaVax be tested in patients with earlier-stage NSCLC cancer and in patients who are not candidates for chemotherapy, and that research be conducted to determine which subgroups of NSCLC patients do and don't respond to the vaccine.^[8] It has been suggested that CimaVax may also be effective in other types of cancer that are dependent on EGF/EGFR, including many cases of prostate cancer.^[8]

International

Trials are being organized in the United States, the European Union, Japan,^[4] and Serbia.^[6] In late October, the United States Food and Drug Administration authorized^[11] the Roswell Park Cancer Institute to conduct a Phase I/II clinical trial of CimaVAX in patients with non-small cell lung cancer.^[12] By the middle of the next month, nearly 200 people had volunteered to be subjects in the trial.^[13]

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