

TECHNOLOGY OFFERS

Combined Prophylactic and Therapeutic HPV Vaccines (P-1382)

An immunogenic polypeptide combining HPV epitopes for therapeutic and prophylactic use

EXECUTIVE SUMMARY

Cervical cancer is women's second most frequent cancer worldwide. Clinical and molecular studies have shown that certain types of HPV, referred to as high-risk types, are the etiological agents of this disease. Two anti-HPV vaccines for the prophylaxis of cervical cancer have been licensed recently by Merck (Gardasil™) and GlaxoSmithKline (Cervarix™). Both vaccines rely on the major capsid protein L1 in the form of virus-like particles (VLPs) as antigen; they protect against the HPV types from which the L1-VLPs were derived, yet are largely ineffective against all but the most closely related HPV types. The two most prominent high-risk HPV types, 16 and 18, are the major targets of both vaccines, although there is evidence for partial cross-protection against HPV types 31 and 45. The limited cross-protective capacity of L1-based vaccines, which is the main reason for the continuing effort toward the development of improved vaccination strategies, likely reflects the HPV type specificity of L1 neutralizing epitopes.



James Gathany, Wikimedia, Public Domain
https://commons.wikimedia.org/wiki/File:Vaccination_of_girl.jpg

BENEFITS

- Prophylactic and therapeutic treatment of infections with HPV types before or after infection

Category

Vaccine

Indication

HPV

Development stage

Pre clinical

Seeking

Licensing, Development partner

TECHNOLOGY BACKGROUND

A recently developed alternative strategy for increasing peptide immunogenicity relies on the use of thioredoxin (Trx) as a scaffold protein with the ability to constrain the structure of single-copy as well as multimeric (tandemly repeated) peptide epitopes inserted within its surface-exposed active site loop. This strategy has also been used to present HPV L2 peptides for immunization. In a subsequent improvement of the thioredoxin scaffold, it was found that by using Trx variants from Archaeobacteria, induction of anti-host thioredoxin antibodies can be significantly reduced. The vaccine is composed of an immunogenic polypeptide comprising (i) a B-cell epitope of HPV, (ii) a T-cell epitope of HPV, and (iii) the scaffold polypeptide thioredoxine. The vaccine can be used in prophylactic and therapeutic approaches against infections with human papillomaviruses.

DEVELOPMENT STAGE

Preclinical

APPLICATIONS

- Pharmaceutical composition
- Prophylactic and therapeutic Vaccine for HPV related diseases

INTELLECTUAL PROPERTY

Patent application submitted.

- EP AZ 18 175 218.9, Combined prophylactic and therapeutic vaccines, Application Date May 30, 2018

PUBLICATIONS & REFERENCES

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ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg