SCAFFOLD-STABILIZED L2 PEPTIDES AS HPV VACCINE

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HINTERGRUND

Cervical cancer is women's second most frequent cancer worldwide with an estimated 500,000 cases and approx. 250,000 deaths per year. It has been established that infection with certain ("high-risk") types of human Papillomaviruses (HPV) is the most important risk factor for the development of cervical cancer. Two vaccines which are commercially available were developed based on the HPV L1 protein.

There are, however, some drawbacks to these L1- based vaccines: the immune reaction against L1 is mostly type-specific, meaning that there is hardly any cross-protection against HPV types that were not included in the vaccine. Also, the L1 vaccines have to be produced either in yeast or in insect cells, which makes production cost-intensive.

Our international team of researchers has come a huge step closer to a solution of these problems: the thioredoxin-L2 vaccine can be produced in standard E. coli bacteria, which makes a cost-effective production feasible. Moreover, immunization against peptides from the L2 protein gives a robust immune reaction that provides cross-protection against a variety of other high-risk HPV strains.

LÖSUNG

The thioredoxin-L2 vaccines consist of thioredoxin as a "scaffold" protein and one of several L2 peptide concatemers. The most effective peptides have been identified by epitope mapping; a positive correlation of the number of peptide units in the concatemer with the titer of neutralizing antibodies has been shown.

VORTEILE

- Simple production in E. coli
- Increased titer of neutralizing antibodies
- Cross-immunity against other cancerogenic HPV strains

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ENTWICKLUNGSSTAND

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CATEGORIES

//Medizin und Pharma

ANWENDUNGSBEREICHE

The proteins can be used as a vaccine to induce immunity against HPV primary infection (preventive vaccination), which can be used against a variety of high-risk HPV strains.

PUBLIKATIONEN & VERWEISE

1. Rubio et al. “Potent anti-HPV immune responses induced by tandem repeats of the HPV16 L2 (20 -- 38) peptide displayed on bacterial thioredoxin” in Vaccine 2009 Mar 18;27(13):1949-56.
   See: https://www.ncbi.nlm.nih.gov/pubmed/19368776
2. Seitz et al. “Influence of oxidation and multimerization on the immunogenicity of a thioredoxin-l2 prophylactic papillomavirus vaccine” in Clin Vaccine Immunol. 2013 Jul;20(7):1061-9.
   See: https://www.ncbi.nlm.nih.gov/pubmed/23677323