

Technology Offer

Vehicle for oral DNA-Vaccination

Reference Number
TO 02-00038

The Challenge

DNA-vaccines are referred to as third-generation-vaccines. The immunogenicity and the protective response after DNA vaccination have been proven. But the immune response induced by application of naked DNA is not as strong as the response obtained by using live bacteria for the immunisation. Therefore there is a high demand for identifying bacterial vehicles for DNA-vaccines, able to transfer the antigen gene into the eukaryotic host cell and to induce a strong immune response without being toxic for the host. Cell invasive bacteria, known to transfer genes into eukaryotic cells are normally toxic for the host cell or cannot be resorbed by the mucosa or no experience exists in using them as vaccination strains. The well known vaccination strains of *Salmonella* were known to lack the capability of gene transfer to eukaryotic cells.

The Technology

An attenuated *Salmonella* strain was used to transfer antigen genes into eukaryotic cells in vitro and also in vivo using mice. Only single doses were sufficient to obtain a strong immune response. Multiple doses protected the animals efficiently against lethal doses of the virulence factor used for immunisation.

Commercial Opportunity

The invention can be the basis for the development of highly effective oral applicable DNA-vaccines in any conceivable field of application.

Advantages are

- well known vaccination strains
- effective gene transfer
- strong immune response
- no toxicity
- low costs

Patent situation

Patent applications in Europe, USA, Canada and Japan are currently pending (international publication number WO 98/48026)

Further Reading

Use of live bacterial vaccine vectors for antigen delivery: potential and limitations. Medina E, Guzman CA. Vaccine (2001) Feb 8;19(13-14):1573-80.

Oral somatic transgene vaccination using attenuated *S. typhimurium*. Darji A, Guzman CA, Gerstel B, Wachholz P, Timmis KN, Wehland J, Chakraborty T, Weiss S. Cell (1997) Dec 12;91(6):765-75.

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