

## **InvenioIP - Technology Details**

**Institution:** University of Maryland, Baltimore

**Docket:** DH-95-036

**Title:** Bactofection: The Use of Attenuated, Live Bacteria to Deliver DNA to Eukaryotic Cells in Vivo

**Summary:** Previously, DNA and RNA vaccines have been given by direct injection of ~naked~ DNA and RNA into animal muscle tissue or by intradermal injection of DNA using ~gene gun~ technology. Bactofection, on the other hand, enables oral delivery of DNA and RNA vaccine antigens to mucosal surfaces using live attenuated bacterial vectors.

**Applications:** Bactofection is an entirely new paradigm for DNA and RNA vaccination. The potential for commercial application of bactofection includes delivery of viral, protozoan, metazoan and bacterial vaccine antigens to animal cells or animal tissues for the induction of mucosal and systemic immune responses against said antigens.

**Advantages:** Bactofection provides a significant advantage over the existing art, by providing an effective, inexpensive and stable method for the oral delivery of DNA and RNA vaccines to mucosal lymphoid tissues. There are imposing practical reasons for using the oral route for the delivery of mucosal vaccines. The oral route has been the most widely used and accepted mucosal vaccination route and has proven to be practical and reliable in public health programs. Moreover, large-scale field trials demonstrated that live oral vaccines, such as polio, adenovirus, cholera and typhoid vaccines, are highly efficacious against their respective target mucosal pathogens. Finally, studies in laboratory animals and volunteers have shown that vaccination with live oral bacterial vectors induces humoral and cell-mediated immune responses in the mucosal and systemic compartments.

**State of Development:** N/A

**R and D Required:** N/A

**Licensing Potential:** UM seeks to develop and commercialize via license agreement with a company active in vaccine areas not already licensed.

**Patent Status:** U.S. patents 5,877,159, 6,150,170, 6,682,729 entitled ~Method for Introducing and Expressing Genes in Animal Cells, and Live Invasive Bacterial Vectors for Use in the Same~ issued. Australian patent # 706104 issued September 23, 1999. Japan patent # 3629274 issued December 17, 2004. CA and EP patents pending.

**Related Publications:** N/A

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