



Bacillus expression system

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Dstl technologies

Dstl (the Defence Science and Technology Laboratory) is an agency of the UK Ministry of Defence with a research budget exceeding £180 million per annum and is the UK's centre of excellence for research into prophylactics and therapeutics against potential Biological and Chemical Warfare agents. Dstl owns patents on an invention providing recombinant *Bacillus subtilis* which has been mutated to make it more useful as an *in vivo* protein expression system. The changes are anticipated to make the *B. subtilis* strain more efficient at producing proteins.

***Bacillus subtilis* protein expression system**

Large scale fermentation of *Bacillus subtilis* is widely used in the industrial production of enzymes used for example, as ingredients in food and detergents and during production in the paper, textile and brewing industries. In wildtype *Bacillus* the six principal extracellular proteases will result in product degradation, without the inclusion of a cocktail of protease inhibitors. In this invention, these proteases have been completely removed, together with the sigma factor, SpoIIAC, leading to loss of the bacillus' ability to form spores (sporulate). The introduction of asporogenicity makes sterile protein production more feasible by decreasing the risk of environmental contamination by resistant spores. *B. subtilis* may find application as a heterologous protein expression system in bioindustry when a desired protein has proved difficult to express in *E. coli*, possibly due to toxicity.

WO 2003/006649 – Patent status:

Granted in: Europe (Belgium, France, GB and Switzerland) and USA.

Pending in: Japan.

Technology status

Although the invention was created by Dstl, much of the development work on this technology was out-sourced to a contractor who has produced for Dstl a mutant strain in which six proteases have been removed together with SpoIIAC.

Licensing

Ploughshare is able to licence the above patents on a non-exclusive basis although exclusivity may be available for selected fields of application. Support from within the Dstl organisation in technology transfer is available. A licence might be required over patents owned by OmniGene Bioproducts Inc. which protect the protease deficient *B. subtilis* WB600 strain.

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