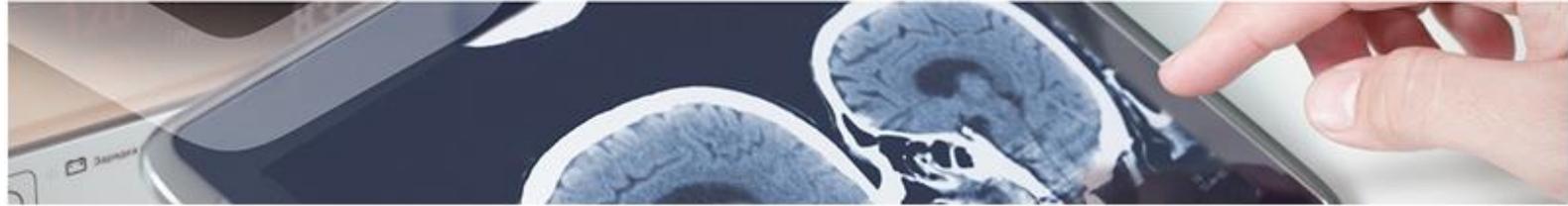


Industrial Biotechnology, Diagnostics, Therapy

Hypermutable strains of *Mycobacterium tuberculosis* and *M. smegmatis*

A research group of the Andalusian Public Health System, in collaboration with the University of Seville, CSIC and the University of Sussex, has developed hypermutable strains of *M. tuberculosis* and *M. smegmatis*.

Oficina de
**TRANSFERENCIA
DE TECNOLOGÍA**
Sistema Sanitario Público de Andalucía



Description

The assessment of development of resistance to antibiotics (in clinical use, in assessment or in development) and/ or mutations compensating the loss of fitness, both *in vitro* and *in vivo*, is a process used to predict the resistance to them. In order to explore the worst possible clinical scenarios, hypermutable strains (with a high rate of spontaneous mutation production) should be used. However, the mechanisms that cooperate to avoid the acquisition and fixation of mutations in *M. tuberculosis* remain largely unknown. Most hypermutable strains of pathogenic bacteria have a deficient mismatch repair system, but the lack of an MMR system in mycobacteria rule out this link in *M. tuberculosis*. Thus, hypermutable *M. tuberculosis* strains have not been characterized until now.

In this scenario, our research group has created stable hypermutable strains by accurately removing a specific gene in *M. tuberculosis* and *M. smegmatis* which increases the mutant frequency in one to two orders of magnitude over the wild-type. Our bioinformatics studies predict that all the species of the genus *Mycobacterium* have said gene and that they will most likely acquire the hypermutable phenotype.

Other possible applications, apart from those already mentioned are: the procurement of vaccine strains with several mutations in virulence genes or of spontaneous mutants in biological processes in general.

described to the date. Hence, the present methodology is the only which allows:

- Using the genus *Mycobacterium* strains (including *M. smegmatis* and *M. tuberculosis*) for the assessment of resistance to new antibiotics, a combination of them or combinations of already known antibiotics, both *in vitro* and in animal models.
- Using the already mentioned strains for the characterization of antibiotic targets and, in general, for the procurement of mutants in biological processes in *Mycobacterium* in which the mutation frequency is very low.
- Using the hypermutable strain of *M. tuberculosis* for obtaining new vaccine strains with several mutations in virulent genes, which could prevent the development of virulent revertant strains.



Intellectual property

This technology is covered by an Spanish patent application with possibility of international extension.



Aims

We are looking for a partner interested in a license and/or a collaboration agreement to develop and exploit this innovative technology.



Advantages

The antimutable activity of this gene and its orthologues in the rest of the bacteria of the genus has not been



Classification

Field: Industrial Biotech, Diagnostics, Therapy
Technology: Vaccines
Pathology: Infectious diseases