Novel polymeric coating for bioactive agents release in prosthetic meshes that avoids post-operative infections

The Spanish National Research Council (CSIC), in collaboration with University of Alcalá, has developed a novel coating for prosthetic meshes that is an effective vehicle for bioactive agent controlled release. The bioactive agent can be antibiotics, antitrombogenics, etc. An important progress in abdominal surgical applications is achieved since, for the first time, a surface modification of the prosthesis is performed avoiding post-operation infections.

Industrial Partners for a license agreement are sought.

Positive impact in abdominal surgery

The use of synthetic meshes for the repair of abdominal wall defects is very common. However, certain physical properties of these biomaterials can lead to undesirable consequences like for example infections. Surgical infection is caused by infiltration and proliferation of bacteria into and within the pores and interstices of these meshes.

Antibiotic administration in monodose is an effective prophylactic method for the prevention of infections in certain types of surgery. However in abdominal wall hernia surgery the best way to deal with the infection is to prevent microorganisms colonization in the initial stage. Recently, the CSIC has developed an effective product to prevent this initial bacteria adhesion. The development consists in a modification of prostheses surface by coating with a new copolymer containing the bioactive agent. This type of coating has been successfully proven for antibiotic release where controlled delivery was achieved in the next 48 hours after operation. An effective bactericide action was achieved and the inhibition effect has been tested satisfactorily. The impact of this development in abdominal hernia surgery will be very important since it avoids the need of further operation due to post-operative infections.

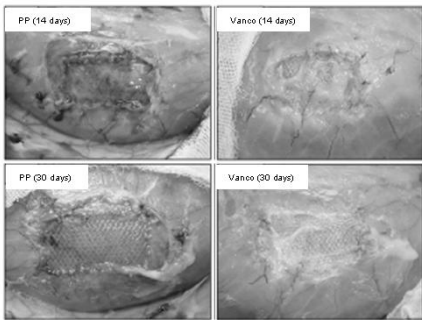

Image of the organ treated with uncoated mesh (PP) and mesh coated with copolymer containing vancomicine (Vanco) infected with S. epidermidis

Innovative aspects and advantages

- A controlled and located release of bioactive agent is achieved.
- The adequate solubility allows the liberation in a suitable way.
- The post-operative infection is avoided in the following critics 48 hours.
- The polymers of this coating are reabsorbed in few days avoiding undesirable second effects.
- There is no need of further operations due to bacterium colonization.
- Applicable clinically to prevent implant infection in patients at risk for having an altered immune system: immunosupressed, diabetes, oncological, elderly, etc.

Patent Status

Spanish patent.

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