Universitat de Barcelona

Grau d'Enginyeria de Materials

Title: **Biocide agents for implantable devices**

Student: Héctor Ferrer ribas

Date: June 2018

Supervisor/s: Dr. Javier Fernández González
Departament of Materials science and Chemistry Fisics

The following bibliographic study has been focused on the different coatings that are being used, as well as avant-garde application techniques, for the improvement of the implant incorporation in human the body.

Studied coatings will have either organic nature, inorganic nature or a combination of both. A comparison between its advantages and disadvantages affects in the application of these, in addition, the possibility of combining them with drug deliver in case that it can increase its effectivity on them. Information research has been done in order to understand the bactericidal effect of the two main types of bacteria that can be found in the human body, gram-positive and gram-negative bacteria. Due to the interaction between bacteria and coating the bactericidal mechanisms will be explained in a clear and simple way in order to have a small idea of its functioning.

Moreover, coatings biocompatibility will be considered in order to predict its durability once that medical implants have been implanted.

The different coating techniques that are being used actually will be generally commented in order to give a general overview of the fields that researchers have focused on more.

The type of coatings that can be found in this study are: silver coatings, titanium-copper coatings, zinc oxide coatings, iron oxide coatings, poly-ε-lysine coatings, quaternary ammonium compounds coatings, polysiloxanes coatings, chimeric peptides coatings, antimicrobial enzymes coatings and quaternary polyelectrolytes coatings.