LONG life
EUROPEAN CERAMIC IMPLANTS PROJECT

The LONGLIFE project has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°280741

To get more information about the project, please visit LONGLIFE website :

www.longlife-project.eu

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LONGLIFE PROJECT PRESENTATION

SEVENTH FRAMEWORK PROGRAMME

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LONGLIFE PROJECT: MISSION AND AIM

A MISSION : AN IMPLANT FOR LIFE

LONGLIFE consortium will develop accelerated tests able to reproduce more effectively the different degradation mechanisms and their interplay in a multi-physics approach, in order to ensure an implant reliability and lifetime superior to current implants'.

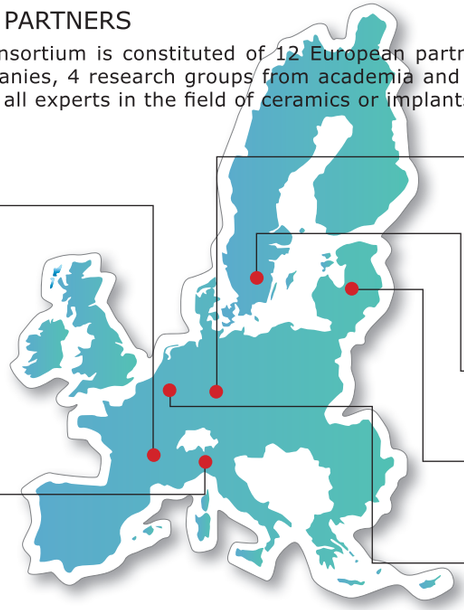
AIM

The aim of LONGLIFE is to develop new multi-functional zirconia oral and spine (lumbar inter-vertebral disc) implants, with a perfect reliability and a lifetime longer than 60 years, insuring an 'implant for life'. Such an ambitious goal, motivated by the risks and costs associated to revision surgery, will only be reachable by new zirconia-based composites and by an enhancement of the osseointegration capabilities of the implants in contact with bone.

LONGLIFE PROJECT: PARTNERS

EUROPEAN PARTNERS

LONGLIFE consortium is constituted of 12 European partners, 5 SMEs, 2 large companies, 4 research groups from academia and one research organization, all experts in the field of ceramics or implants.



FRANCE

KISCO
INSA LYON
anthogyr
AKÉO PERFORMANCE ENGINEERING

ITALY

GERMANY

DOCERAM MEDICAL CERAMICS
NTTF Coatings advanced surface technologies
UNIVERSITÄTS KLINIKUM FREIBURG

SWEDEN

swerea|IVF

LATVIA

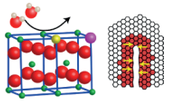
"Plasma & Ceramic Technologies" Ltd.

LUXEMBOURG

Kurt Salmon

ADVANCED MULTIFUNCTIONAL ZIRCONIA CERAMICS FOR LONG LASTING IMPLANTS

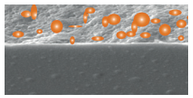
NEW MATERIALS



Ce- TZP or MIII-M-TZP -based matenals

LONGLIFE's goal is to develop new zirconia based implants witha high degree of reliability and stability in vivo.

NEW MATERIALS

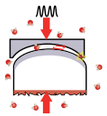


antibacterial and/or bioactive coatings

LONGLIFE's goal is to develop new surfaces without compromising mechanical properties and stability.

NEW MULTIFUNCTIONAL DENTAL AND SPINE IMPLANTS

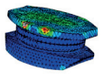
ASSESSMENT



Extensive multiphysics testing

The innovative approach of LONGLIFE will be to develop combined, "multiphysics" solicitations tests.

CERAMIC ORIENTED DESIGN



optimised to reduce surgical risk and failure risk

Computer- assisted design will be conducted to develop long lasting implants.

TOUGH, STRONG AND STABLE CERAMICS

As zirconia-based ceramics are the only oxides able to couple high stress resistance and fracture toughness thanks to transformation toughening, a strong effort will be given to the improvement of their stability in the presence of water, without decreasing their toughness and strength.

IMPLANTS WITH FUNCTIONAL ADDED VALUES

Osseointegration will be improved by the chemical and topographical modification of the surface. We aim at producing zirconia surfaces able to decrease the risk of bacterial adhesion and improve bone apposition, for better clinical success. Given the specific nature of ceramics, especially versus the risk of brittle failure, we aim at developing new ceramic-oriented designs for the implants, and not just 'copy and paste' from metal implants as it is generally done at present. This 'implants by design' approach will ensure a better, long-lasting success of oral and spine implants.