KEY AIMS OF THE REBIOSTENT PROJECT

- To develop ***novel biodegradable and biocompatible biomaterials*** intended for cardiovascular stent fabrication.
- To ***overcome the shortcomings*** in currently available metal and/or polymer stents (e.g. thrombosis, restenosis, neo-atherosclerosis).
- To establish a portfolio of ***new natural*** and ***synthetic polymers,*** copolymers and blends using ***green manufacturing processes.***
- To use ***novel reinforcement additives*** and ***biofunctionalities*** to address biological requirements.
- To design ***novel stent geometries*** to address biomechanical issues.
- To break new ground in ***extensive biocompatibility testing*** reducing number of animal experiments.

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ReBioStent Partners The project consortium has thirteen partner organisations from five countries across Europe: Germany, Italy, Ireland, Spain, and United Kingdom, and started in January 2014 for a duration of three years.

UNIVERSITY OF WESTMINSTER
LUCIDEON insight creating advantage
Universitätsklinikum Knappschaftskrankenhaus Bochum
UKRUB UNIVERSITÄTSKLINIKUM DER RUHR-UNIVERSITÄT BOCHUM
Life and Device
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FAU FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG
UNIVERSITY OF CAMBRIDGE
Fraunhofer IPA
ORNIA BIOMATERIALS
ARTERIUS
EURESCOM

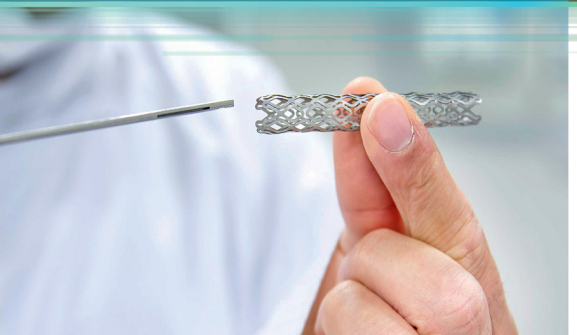
ReBioStent

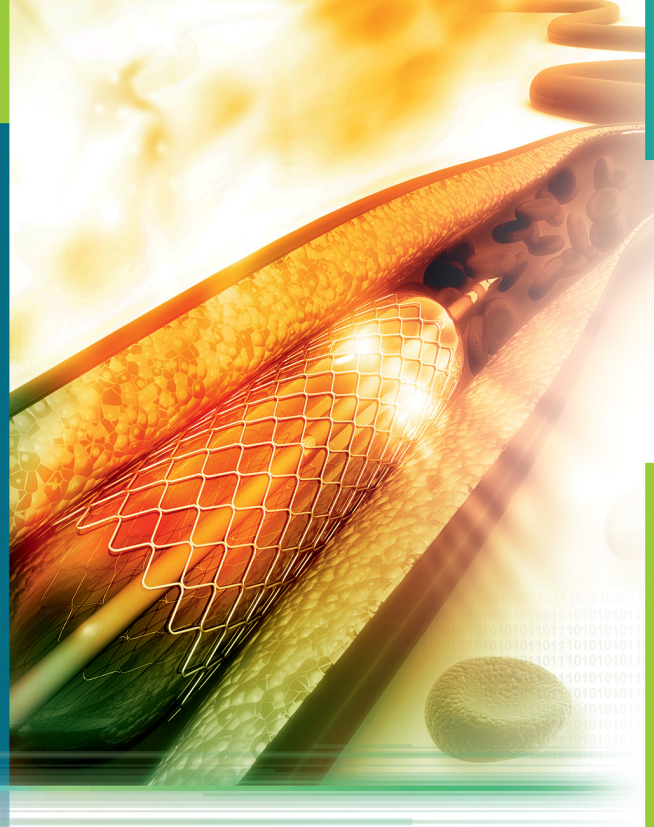
Reinforced Bioresorbable Biomaterials for Therapeutic Drug-Eluting Stents

ReBioStent is a 3 year Research and Technology Development (RTD) Project under the European Union's Seventh Framework Programme (FP7) addressing the work programme theme on Biomaterials for Advanced Therapies and Medical Devices in the cardiovascular field.

WHAT ARE BIODEGRADABLE STENTS, AND WHAT ARE THEY FOR?

- Coronary artery disease (CAD) occurs when atherosclerosis of the coronary arteries around the heart results in narrowing (stenosis) which limits blood flow to the heart muscle. This can cause myocardial infarction and death.
- Treatment of CAD with bare metallic or drug-eluting stents is long established, but because of the risks of long term implantation, biodegradable stents are now available.
- Currently available biodegradable stents have several limitations, linked to mechanical strength and performance.





Degradation after a pre-defined, carefully engineered period, thus preventing common complications associated with conventional stents such as inflammation, in-stent restenosis, late-thrombosis and neo-atherosclerosis.

Novel materials and novel stent design which will have appropriate mechanical properties to hold open the arterial wall, restore normal blood flow, and prevent restenosis.

UTILISES NOVEL SYNTHETIC AND NATURAL BIODEGRADABLE POLYMER FAMILIES:

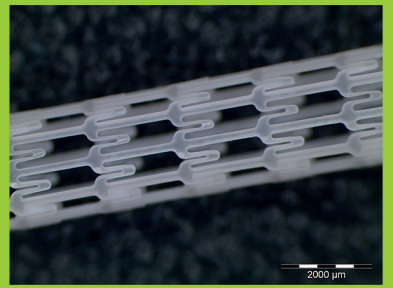
- A series of PEG functionalized polyesters using a supercritical CO_2 method.
- Natural polyhydroxyalkanoates (PHAs) produced via bacterial fermentation.

BIOPOLYMER COMPOSITE FORMULATION WITH INORGANIC FILLERS USING:

- Phosphate nano-bioglass

SURFACE FUNCTIONALISATION TO PROMOTE ENDOTHELIAL CELL ATTACHMENT AND PROLIFERATION LEADING TO ENHANCED ENDOTHELIALISATION IN VIVO, USING:

- Surface micro-patterning by laser ablation technology
- Plasma-mediated grafting of bioactive molecules



INCORPORATION OF ANTIPROLIFERATIVE DRUG TO PROVIDE CONTROLLED DRUG DELIVERY USING:

- Mesoporous silicate bioabsorbable glass
- PHA nanospheres