HyMedPoly

Drug-Free Antibacterial Hybrid Biopolymers for Medical Applications

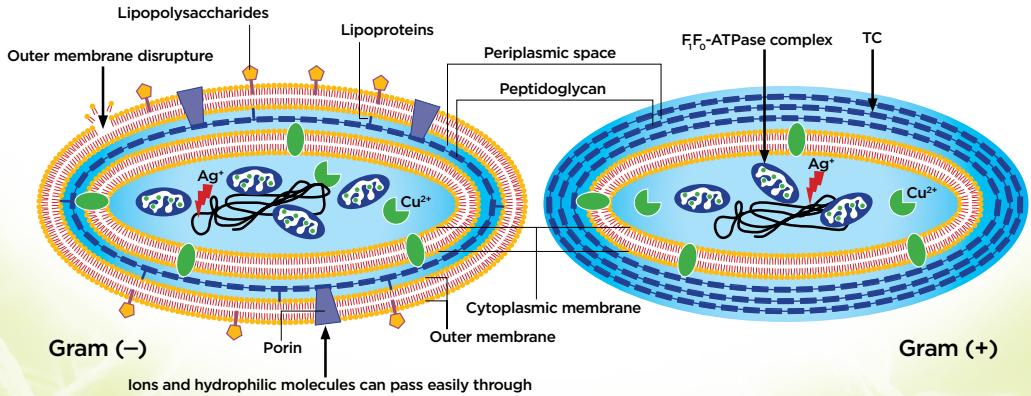
A H2020 Marie Sklodowska-Curie Innovative Training Network

hymedpoly.eu

HyMedPoly is developing new therapies based on biomedical drug-free antibacterial polymers and inorganic materials for drug-free antibacterial hybrid biopolymers for infections.

HyMedPoly is a H2020 Marie Skłodowska-Curie Innovative Training Network. A cohort of 15 Early Stage Researchers (ESRs) is being trained to develop and qualify material systems with antibacterial activity for medical applications, such as wound care, implants and bio film prevention.

Antibacterial active ions, molecules and polymers e.g.	Mechanism of antimicrobial activity:
Ag^{+}, Cu^{2+}	Membrane damage, inhibition of proliferation, ROS formation, enzyme inhibition
Trans-cinnamaldehyde (TC)	Membrane damage, inhibition of ATPase (F_1F_0-ATPase complex) cytoplasmic coagulation
Antimicrobial peptide magainin-II	Membrane damage, enzyme inactivation
Cellulose-g-(PEtOx-DDA)	Cell lysis



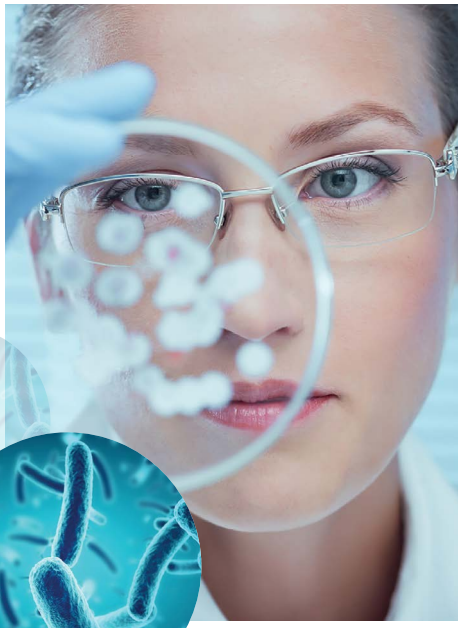
Infection has become one of the toughest problems in the medical world, and as bacteria become more resistant to drugs there are fewer effective antibiotics to fight against pathogens.

HyMedPoly is addressing this challenge by developing new medical polymer systems with intrinsic antibacterial functionality concentrating on:

- **hybrid polymers with antibacterial functionality**
- **inhibitors that can permanently deactivate bacteriological proteases**
- **bioactive ceramics and glasses that prevent bacterial growth**

Our researchers will be able to play a pivotal role in advancing anti-bacterial materials for the coming decades by bringing state-of-the-art technology to advanced products for medical and personal healthcare and contributing to the development of effective therapeutic strategies.

The HyMedPoly researchers bring a solid background from fields as diverse as materials science, engineering, medical science and biology. Linking the considerable academic, industrial and clinical research capabilities of the project group, the following 15 PhD projects are developing, synthesising and testing materials and composites to address the fundamental issues of future antibacterial therapies:



Degradable Antibacterial Polyesters and Composites

Design and Engineering of Therapeutic Polyurethanes

Bioresorbable Antibacterial Polyesters

Biodegradable and Bioresorbable Polyesters

Novel Antibacterial Natural Polymers

Hydrogel Based Hybrid Antibacterial Polymers

Bioactive Silica Glass

Substituted Hydroxyapatite

Bioactive Phosphate Glass

Innovative Antibacterial Polymers

Antibacterial Materials for Tissue Engineering Scaffolds

Mechanobiology of Cell-Surface Interaction

Mechanics of Porous and Structured Materials

In-vitro Bio-evaluation of Antibacterial Polymers

Antibacterial Testing of Polymers

The Project Group

Our focus is training a new generation of professional researchers who can implement new strategies to combat bacterial infection through novel material systems and who understand innovation from concept to commercialisation.

hymedpoly.eu

DETAILS OF THE PROJECT CONTACTS:

Dr Xiang Zhang, Lucideon Limited
(Project Co-ordinator)
xiang.zhang@lucideon.com

Prof Ipsita Roy, University of Westminster
(Scientific Co-ordinator)
royi@wmin.ac.uk

For general project enquiries, please email: **contact@hymedpoly.eu**

BENEFICIARIES

LUCIDEON

UNIVERSITY OF WESTMINSTER

ORNIA

POLITECNICO DI TORINO

FAU FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

University of Southampton

UNIVERSITÄTSKLINIKUM KNAPPSCHAFTSKRANKENHAUS BOCHUM
UKRUB UNIVERSITÄTSKLINIKUM DER RUHR-UNIVERSITÄT BOCHUM

BLÁFAR

PARTNERS

EURESCOM

IK4 TEKNIKER

Horizon 2020
European Union Funding
for Research & Innovation

HyMedPoly received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No. 643050