



## Deliverable D5.1

### Research Highlights and Project Profiles – Web Based

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### ***Abstract***

The report describes research highlights in the first two years of the Marie Skłodowska Curie Action project, HyMedPoly, and its approach to posting information on the website set up to disseminate project information to the general public and scientific community.

The project has appointed 15 Early Stage Researchers, who have made good progress in starting their work in antimicrobial materials synthesis and testing. The website is a key part of the dissemination activities. It has been structured to facilitate exploitation of the project results.

[End of Abstract]

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## Impressum

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[Short project title]	HyMedPoly
[Number and title of work-package]	
WP 5 Outreach	
[Number and title of task]	Task 5.1 Web Based Material
[Document title]	Research Highlights and Project Profiles – Web Based
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## Copyright notice

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## Executive Summary

HyMedPoly is developing new therapies based on intrinsically antibacterial polymers, polymer composites with inorganic materials and polymers with antibacterial additives for the production of drug-free antibacterial hybrid biopolymers as therapeutic materials to prevent, control and remove infections.

This report summarises the results of the first two years of HyMedPoly activities which ended in December 2016 and the role of the project website as a key element of the proactive dissemination programme.

The HyMedPoly website, [www.hymedpoly.eu](http://www.hymedpoly.eu), was set up at an early stage of the programme. In addition to acting as the main vehicle for external communications on network activities and achievements, it also played a vital role in the recruitment of the cohort of fifteen Early Stage Researcher (ESR).

A standard recruitment approach, based on an online platform with access through the project website, led to all fifteen ESR positions being filled between September 2015 and March 2016. The Web Platform to recruit the Early Stage Researchers is described in D6.5 – “Public Dissemination”.

By December 2016 (Project Month 24) the ESRs’ projects were all at relatively early stages of development with each making good progress. The ESRs were developing concepts around the themes outlined in the project’s research programme, and at this phase the ESRs have been guided and trained about the importance of publishing specific results for widespread public dissemination and the care needed in order to keep confidentiality in patenting processes. This guidance was planned at an early phase of the work to prepare ESRs for the dissemination of their project results for the next phase of their work when they are expected to have results relevant to be disseminated to the scientific community. As part of the Industrial training program a workshop session dedicated to the best practice for dissemination and communication was organized and is described in D4.3 – “Summer School 2”.

Eleven projects were developing, synthesising and testing new biopolymers, bioceramics and bioactive glasses, two were investigating in-vitro bio-evaluation of antimicrobial biomaterials and two were using computer modelling and digital manufacturing to specify structures and surfaces with maximised antimicrobial effectiveness.

The project website, [www.hymedpoly.eu](http://www.hymedpoly.eu), is the main vehicle for external communications of the project activities and results, and also to the internal communications, with a login point to the project storage area. Pages currently outline the researchers’ profiles and the general approaches to their projects. These pages will be updated as results start to be published. An e-mail address to contact HyMedPoly enables questions and comments to be sent to the researchers.

The “Events” page provides reports on the two workshops run by project members during the first two years and allows download of the presentations. As the project progresses, results and case studies stemming from HyMedPoly activities will be used in the presentations.

Finally a “Publications” page enables download of the newsletters and the 18 deliverable reports with a “Public” dissemination level once they have been cleared for wider publication.

The first two years of HyMedPoly have enabled the project group to establish effective foundations for the researcher cohort and the infrastructure for dissemination. Dissemination of results will grow in the final two years of the project to ensure that both the scientific community and the general public are aware of the impact of the research.

# 1 Introduction

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 developing new therapies based on intrinsically antibacterial polymers, polymer composites with inorganic materials and polymers with antibacterial additives for the production of drug-free antibacterial hybrid biopolymers as therapeutic materials to prevent, control and remove infections.

Our ultimate goals are to develop a new generation of professionals who will play a pivotal role in pushing forward this challenging and knowledge-intensive field for the coming decades to benefit the European economy and who will be able to bring state-of-the-art technology to industry, advance products for hospitals and personal healthcare, and develop new and improved therapeutic strategies.

This report summarises the results of the first two years of HyMedPoly activities, which ended in December 2016, and the role of the project website as a key element of the proactive dissemination programme.



## 2 Research Highlights and the Role of the Project Website

### 2.1 Research Highlights

The HyMedPoly started in January 2015. Its website, [www.hymedpoly.eu](http://www.hymedpoly.eu), was set up at an early stage of the project programme as both the main vehicle for external communications on network activities and achievements and a vital route for receiving applications for the fifteen Early Stage Researcher (ESR) applications.

A standard recruitment approach was agreed by the project partners with the website playing a key element in advertising and submitting the applications for all fifteen ESR positions. The subsequent interviewing process led to all fifteen ESR positions being filled between September 2015 and March 2016. The project partners and the ESR projects are detailed in Appendix 1.

By December 2016 (Project Month 24) the ESRs' projects were all at relatively early stages of development with each making good progress. All projects passed the mid-term review with the European Commission Research Executive. Eleven projects were developing, synthesising and testing new biopolymers, bioceramics and bioactive glasses that can act as active agents to prevent or eradicate bacterial infections. Two projects were investigating in-vitro bio-evaluation of antimicrobial biomaterials with a focus on wound dressings. A further two projects were using computer modelling studies and digital manufacturing approaches to specify structures and surfaces which will maximise the antimicrobial effectiveness of the novel materials and products developed. In each case the projects had established active communication between the host universities and their industrial or clinical partner.

The ESRs were developing ideas around the themes outlined in the project's research programme, but the relative immaturity of the work meant that specific results for widespread public dissemination had yet to emerge. However, by establishing the ESR cohort within a focussed research programme, the HyMedPoly project group had met its goal of positioning itself both to develop novel therapeutic hybrid biomaterials for antibacterial applications and to build a world leading reputation for the EU in this discipline.

The technology developed by HyMedPoly will potentially lead to a series of new products incorporating novel polymeric, bioceramic and bioactive glass formulations. As a result, it will achieve substantial health benefits in the war on bacteria and healthcare associated infections (HAIs) and impact on their estimated annual cost of at least € 40 billion.

### 2.2 The Role of the Project Website in Disseminating the Project Activities

The project's dissemination campaign is raising awareness of the public and industrial stakeholders of the benefits from using antibacterial products and materials and forms an integral part of the HyMedPoly Exploitation Plan.

There are two distinct phases:

- Phase 1 (Months 1 – 24); Identify state-of-the-art antibacterial applications, key markets, and alternative applications. Disseminating HyMedPoly's aims and early activities.
- Phase 2 (Months 25 – 48): Prepare Exploitation Plans for HyMedPoly technology post project. These activities will highlight the benefits offered by medical polymers in antibacterial applications and their use in prototype demonstrations.

The project's website, [www.hymedpoly.eu](http://www.hymedpoly.eu), aims to communicate widely to the scientific and business communities as well as the general public and was the main vehicle for

external communications during Phase 1, attracting 2,752 unique users in 4,569 sessions up to 31 December 2016 (Project Month 24).

The screenshot shows the homepage of the HyMedPoly website. At the top, there is a navigation menu with links for HOME, ABOUT, EVENTS, NEWS, PUBLICATIONS, CONTACTS, and LOGIN. Below the menu is a large group photo of project members. The main heading reads "HyMedPoly - Drug-Free Antibacterial Hybrid Biopolymers for Medical Applications" with a sub-heading "developing new anti-bacterial therapies based on biomedical polymers and inorganic materials." The page is divided into several sections: "WORKSHOP ANNOUNCEMENT - 3 MAY 2017 IN EIBAR, SPAIN", "NEWSLETTER OCTOBER 2016: ISSUE NO.2", "HYMEDPOLY HOLDS SECOND SCIENTIFIC WORKSHOP IN JULY 2016", and "POSTER PRIZE FOR LUKAS GRITSCH, UNI. ERLANGEN-NUREMBERG, GERMANY". On the right side, there are sections for "NEWS" and "EVENTS" with small thumbnail images and text. A search bar is located at the top right of the main content area.

Figure 1 - [www.hymedpoly.eu](http://www.hymedpoly.eu) - The Home Page

The homepage (Figure 1) has tabs to pages that detail the project's approach, research highlights and outreach activities and give quick access to specific news.

The "About" page overviews the project objectives and links to pages detailing the approach to research, the partners with links to the organisations' webpages (Figure 2), and the researchers and their projects. A listing of all projects (Figure 3) links to details of each research project and the researcher (Figure 4) and enables those interested to e-mail for further details through a generic e-mail address [contact@hymedpoly.eu](mailto:contact@hymedpoly.eu), which links to the project co-ordinators.

The Researcher and Profile pages outline the approach being followed and they will be updated with results as the project generates publishable information to illustrate the progress that has been made.

**HyMedPoly**

HOME ABOUT EVENTS NEWS PUBLICATIONS CONTACTS LOGIN Q

**PARTNERS**

Lucideon	UK	
The University of Westminster LBG	UK	
Vornia Limited	Ireland	
Politecnico di Torino	Italy	
University of Southampton	UK	
Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany	
Fundación TEKNIKER	Spain	
Universitätsklinikum Knappschafts-Krankenhaus Bochum (medical partner)	Germany	
EURESCOM-European Institute for Research and Strategic Studies in Telecommunications GmbH	Germany	

Search site Q

**NEWS**

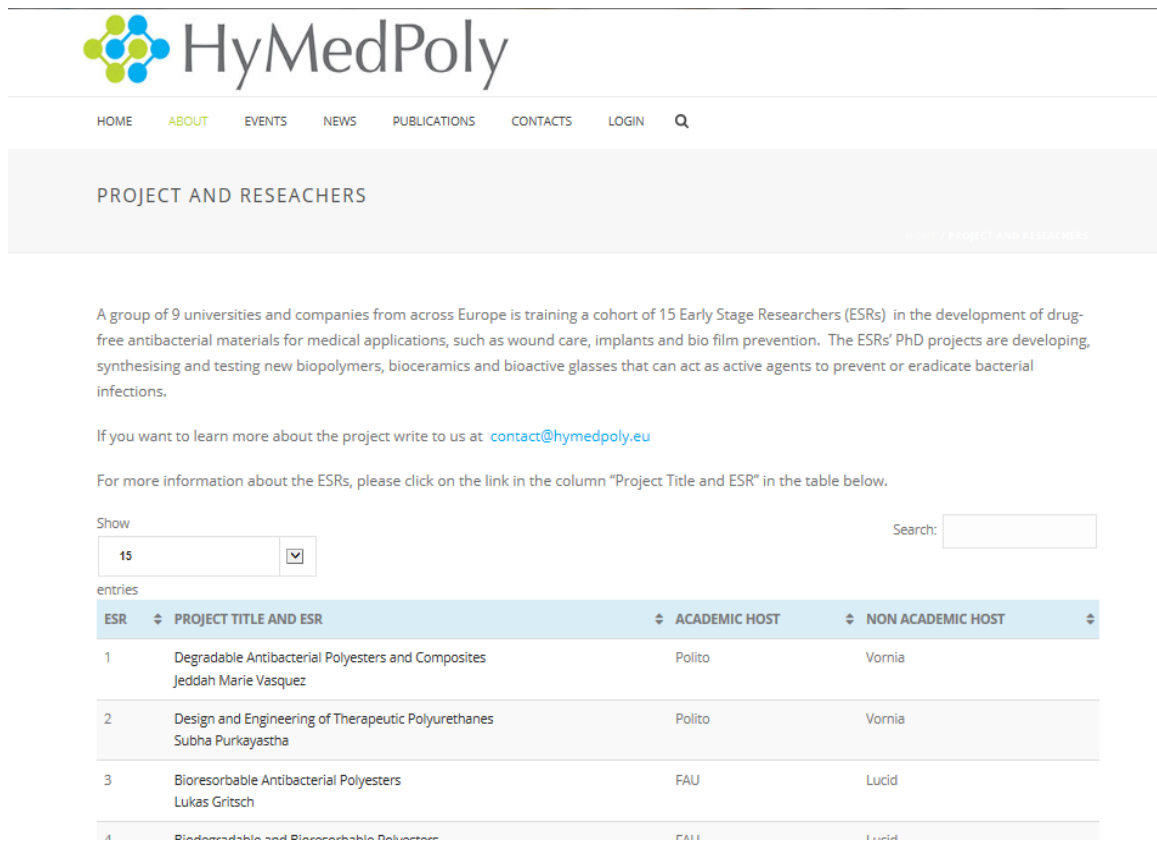
- Workshop announcement – 3 May 2017 in Eibar, Spain  
April 11, 2017
- Newsletter October 2016: Issue No.2  
October 31, 2016
- HyMedPoly holds second scientific workshop in July 2016  
October 6, 2016

**EVENTS**

- Workshop announcement – 3 May 2017 in Eibar, Spain  
April 11, 2017
- Workshop Announcement – 20th July 2016, London  
June 28, 2016
- Workshop Announcement – Biodegradable polymers synthesis and functionalisation, 10 February 2016, Turin  
January 26, 2016

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

Figure 2 - [www.hymedpoly.eu](http://www.hymedpoly.eu) - The Partner Page



**PROJECT AND RESEARCHERS**

A group of 9 universities and companies from across Europe is training a cohort of 15 Early Stage Researchers (ESRs) in the development of drug-free antibacterial materials for medical applications, such as wound care, implants and bio film prevention. The ESRs' PhD projects are developing, synthesising and testing new biopolymers, bioceramics and bioactive glasses that can act as active agents to prevent or eradicate bacterial infections.

If you want to learn more about the project write to us at [contact@hymedpoly.eu](mailto:contact@hymedpoly.eu)

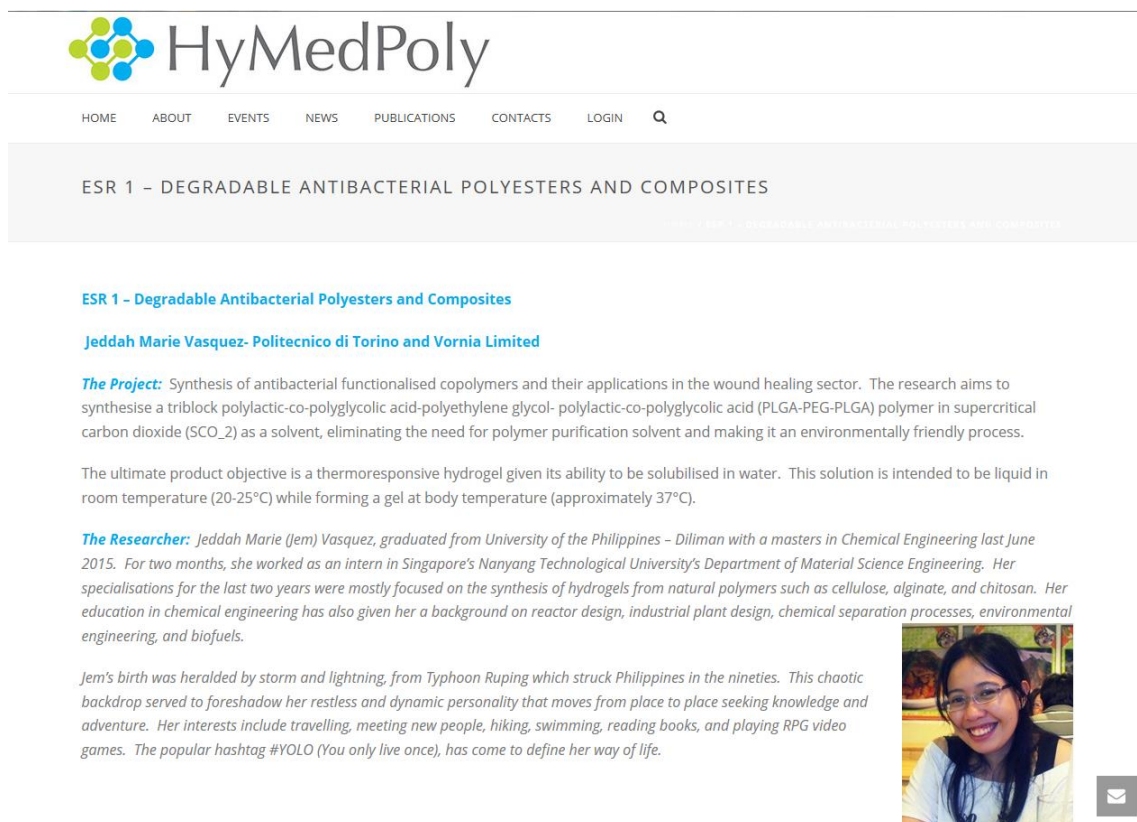
For more information about the ESRs, please click on the link in the column "Project Title and ESR" in the table below.

Show   Search:

entries

ESR	PROJECT TITLE AND ESR	ACADEMIC HOST	NON ACADEMIC HOST
1	<a href="#">Degradable Antibacterial Polyesters and Composites Jeddah Marie Vasquez</a>	Polito	Vornia
2	<a href="#">Design and Engineering of Therapeutic Polyurethanes Subha Purkayastha</a>	Polito	Vornia
3	<a href="#">Bioresorbable Antibacterial Polyesters Lukas Gritsch</a>	FAU	Lucid
4	<a href="#">Bioresorbable and Bioresorbable Polymers</a>	FAU	Lucid

**Figure 3 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – Project and Reseracher Pages**



**ESR 1 – DEGRADABLE ANTIBACTERIAL POLYESTERS AND COMPOSITES**

**ESR 1 - Degradable Antibacterial Polyesters and Composites**


**Jeddah Marie Vasquez- Politecnico di Torino and Vornia Limited**

**The Project:** Synthesis of antibacterial functionalised copolymers and their applications in the wound healing sector. The research aims to synthesise a triblock poly(lactic-co-polyglycolic acid-polyethylene glycol- poly(lactic-co-polyglycolic acid) (PLGA-PEG-PLGA) polymer in supercritical carbon dioxide (SCO<sub>2</sub>) as a solvent, eliminating the need for polymer purification solvent and making it an environmentally friendly process.

The ultimate product objective is a thermoresponsive hydrogel given its ability to be solubilised in water. This solution is intended to be liquid in room temperature (20-25°C) while forming a gel at body temperature (approximately 37°C).

**The Researcher:** Jeddah Marie (Jem) Vasquez, graduated from University of the Philippines – Diliman with a masters in Chemical Engineering last June 2015. For two months, she worked as an intern in Singapore's Nanyang Technological University's Department of Material Science Engineering. Her specialisations for the last two years were mostly focused on the synthesis of hydrogels from natural polymers such as cellulose, alginate, and chitosan. Her education in chemical engineering has also given her a background on reactor design, industrial plant design, chemical separation processes, environmental engineering, and biofuels.

Jem's birth was heralded by storm and lightning, from Typhoon Ruping which struck Philippines in the nineties. This chaotic backdrop served to foreshadow her restless and dynamic personality that moves from place to place seeking knowledge and adventure. Her interests include travelling, meeting new people, hiking, swimming, reading books, and playing RPG video games. The popular hashtag #YOLO (You only live once), has come to define her way of life.



**Figure 4 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – Example of a Project and Researcher Profile**

The “Events” page provides details of the workshops that the project has organised. In advance of the workshop these pages publicise the workshop programme and enable delegates to register (Figure 5). After the event has been run, the pages provide a report of the event and enable users to download the presentations for free. Two workshops were featured to the end of 2016 “Biodegradable Polymers: Synthesis and Functionalisation” (February 2016) and “Biomaterials in Medicine: New concepts of drug-free antibacterial therapies” (July 2016). Further details are reported in HyMedPoly D5.3 “Outreach Activities – Status Report”. Again as the project progresses, results and case studies stemming from its activities will be used in the presentations.

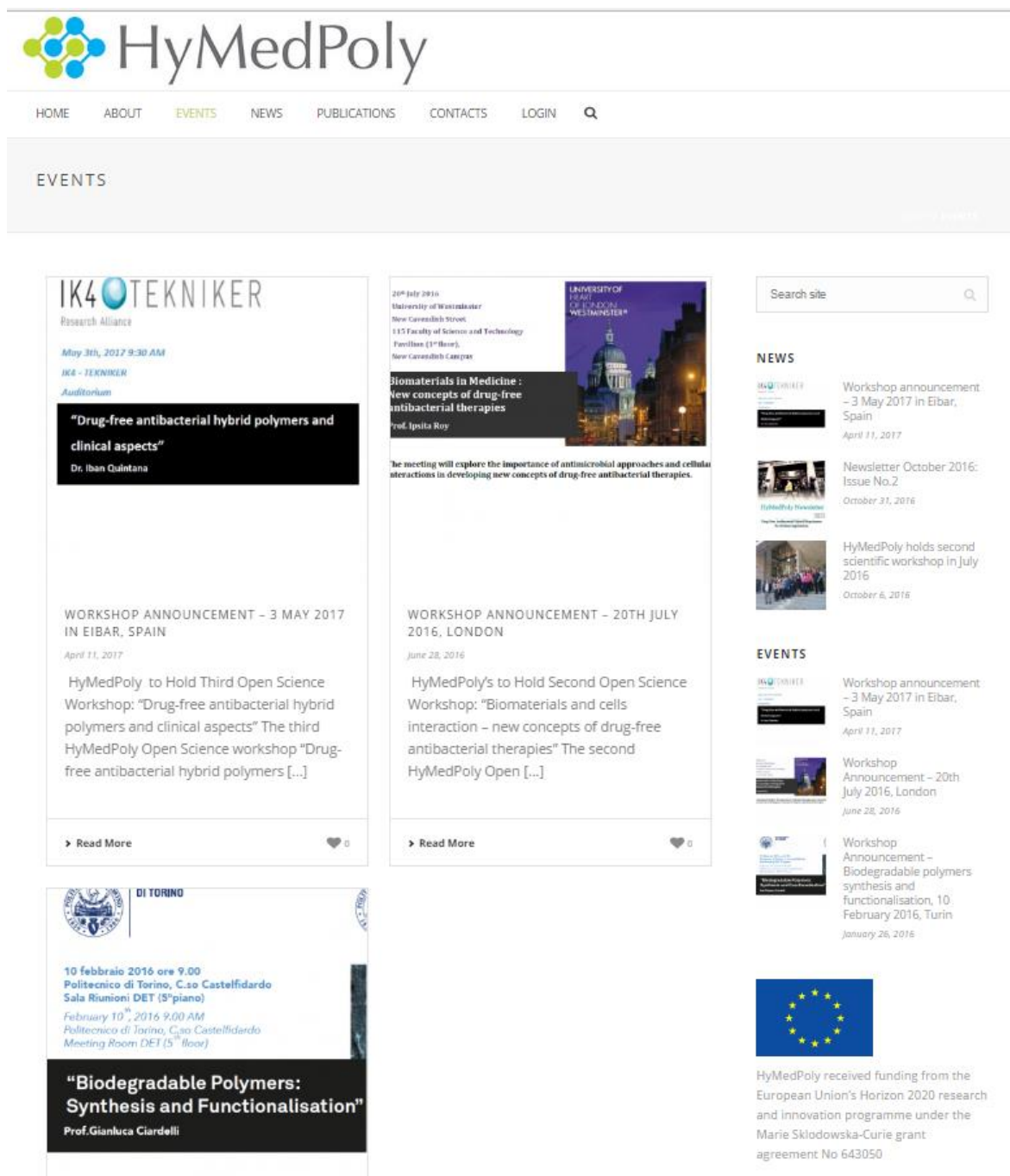


Figure 5 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – The Events Page

The “News” page also updates users on research highlights in addition to activities, such as the ESRs’ and partners’ outreach activities and presentations to conferences.

The “Publications” tab enables users to download the newsletters, which are produced by the ESRs, press releases and the 18 deliverable reports with a “Public” dissemination level. These reports will be available once they have been approved by the European Commission and the project partners (Figure 6).

HyMedPoly

HOME ABOUT EVENTS NEWS PUBLICATIONS CONTACTS LOGIN Q

DELIVERABLES

Show 10 entries

Search:

Search site

DELIVERABLE NUMBER	DELIVERABLE TITLE	DUE DATE
D4.1	Summer school 1	12
D4.2	Workshop 1	17
D4.3	Summer school 2	21
D4.4	Workshop 2	27
D4.5	Summer school 3	33
D4.6	Workshop 3	39
D4.7	International School and Conference	45
D5.1	Research highlights and project profiles - web based	24
D5.2	Written material for project dissemination	24
D5.3	Outreach activities - status report	24

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**NEWS**

Workshop announcement – 3 May 2017 in Eibar, Spain  
April 11, 2017

Newsletter October 2016: Issue No.2  
October 31, 2016

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Figure 6 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – The Deliverable Page

A contact page gives details of the Project Coordinator and Scientific Coordinator as well as the “contact” e-mail for users wanting further information about HyMedPoly and its research activities.



HOME ABOUT EVENTS NEWS PUBLICATIONS **CONTACTS** LOGIN

CONTACTS

For general project enquiries, please send and email to: [contact@hymedpoly.eu](mailto:contact@hymedpoly.eu)

PROJECT COORDINATOR:

**Dr Xiang Zhang, Lucideon Ltd.**




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NEWS

-  Workshop announcement - 3 May 2017 in Eibar, Spain  
April 11, 2017
-  Newsletter October 2016: Issue No.2  
October 31, 2016
-  HyMedPoly holds second scientific workshop in July 2016  
October 6, 2016

EVENTS

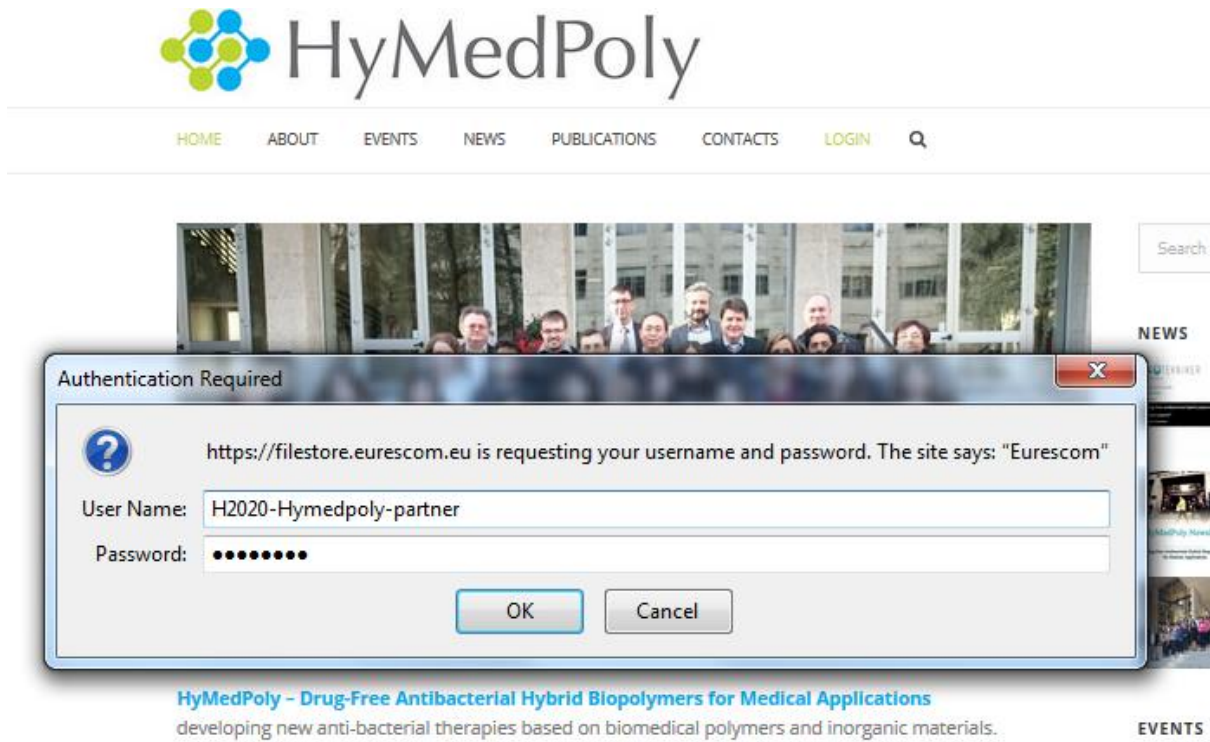
-  Workshop announcement - 3 May 2017 in Eibar, Spain  
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January 26, 2016



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

Figure 7 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – The Contacts Page

Finally, there is the login button to the project storage area. The website is also an entrance point to the project documentation sharing, like that constituting a vehicle to internal communication as well.



**Figure 8 - [www.hymedpoly.eu](http://www.hymedpoly.eu) – Login to Internal Communication Area**



### **3 Conclusions**

The first two years of HyMedPoly have enabled the project group to establish the foundations of the researcher cohort and infrastructure for dissemination, based on a raining plan for best practices on communication and dissemination. In pursuing the work programme, the project group has seen the start of both effective research to produce the required research outputs and proactive communication to disseminate results.

These approaches will develop in the final two years of the project to ensure that both the scientific community and the general public are aware of the impact of the research.

## Appendix 1 – The HyMedPoly Project Group and Research Projects

HyMedPoly aims to develop new therapies based on biomedical polymers and inorganic materials. The nine universities and companies from across Europe shown in Table 1 are creating a cohort of 15 European Industrial Doctorates. The projects, detailed in Table 2, are to synthesise new biopolymers with added antibacterial functionality and develop functionalised bioactive ceramics and glasses that can act as active agents to kill bacteria and prevent their growth.

The new material systems from HyMedPoly are aimed at applications such as wound care, implants and bio film prevention.

**Table 1.1 - The HyMedPoly Consortium Members**

<b>Consortium Member</b>		<b>Legal Entity Short Name</b>
<b>Beneficiaries</b>		
1.	Lucideon	Lucid
2.	University of Westminster	UoW
3.	Politecnico di Torino	Polito
4.	University of Erlangen-Nuremberg	FAU
5.	Vornia	Vornia
6.	University of Southampton	Soton
7.	Knappschafts-Hospital Bochum GmbH	KHB
<b>Partner Organisations</b>		
8.	IK4 Tekniker	IK4
9.	Eurescom	EUR

**Table 1.2 - The HyMedPoly Research Projects**

<b>ESR</b>	<b>Project Title</b>	<b>Researcher</b>	<b>Academic Host</b>	<b>Non Academic Host</b>
1	Degradable Antibacterial Polyesters and Composites	Jeddah Marie Vasquez	Polito	Vornia
2	Design and Engineering of Therapeutic Polyurethanes	Subha Purkayastha	Polito	Vornia
3	Bioresorbable Antibacterial Polyesters	Lukas Gritsch	FAU	Lucid
4	Biodegradable and Bioresorbable Polyesters	Binh Thi Thanh Phan	FAU	Lucid
5	Novel Antibacterial Natural Polymers	Elena Marcello	UoW	Vornia
6	Hydrogel Based Hybrid Antibacterial Polymers	Isabel Orlando	UoW	Vornia
7	Bioactive Silica Glass	Seray Kaya	FAU	Lucid
8	Substituted Hydroxyapatite	Muhammad Maqbool	FAU	Lucid
9	Bioactive Phosphate Glass	Agata Łapa	FAU	Lucid
10	Innovative Antibacterial Polymers	Alexandra Paxinou	UoW	KHB
11	Antibacterial Materials For Tissue Engineering Scaffolds	Sheila Piarali	UoW	KHB
12	Mechanobiology of Cell-Surface Interaction	Faezeh Shalchy	Soton	Lucid
13	Mechanics of Porous and Structured Materials	Loris Domincale	Soton	Lucid
14	In-vitro Bio-evaluation of Antibacterial Polymers	Ayesha Idrees	Polito	KHB
15	Antibacterial Testing of Polymers	Patricia Valera	Polito	KHB