



“Boosting Lignocellulosic Biomass Deconstruction with Designer Cellulosomes for Industrial Applications”

CellulosomePlus

Area NMP.2013.1.1-2: Self-assembly of naturally occurring nanosystems
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Deliverable 10.3

Report on press releases of public information on *CellulosomePlus* activities.

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Authors: O. Salazar/Laura Vay & M. Carrión-Vázquez, CSIC.

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PP	Restricted to the other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

DISTRIBUTION LIST

Partner nº	INSTITUTION	PERSON IN CHARGE
1	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS, CSIC	Mariano Carrión Project Coordinator mcarrion@cajal.csic.es Oscar Salazar/Laura Vay Project Managers oscar.salazar@cajal.csic.es
2	WEIZMANN INSTITUTE OF SCIENCE	Edward A. Bayer Group Head ed.bayer@weizmann.ac.il
3	LUDWIG.MAXIMILIANS UNIVERSITAET MUENCHEN	Hermann Gaub Chair for Applied Physics gaub@lmu.de Michael Nash Research Fellow michael.nash@lmu.de
4	INSTYTUT FIZYKI POLSKIEJ AKADEMII NAUK	Marek Cieplak Group Head mc@ifpan.edu.pl
5	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	Mirjam Czjzek Permanent researcher, DR2 of CNRS mirjam.czjzek@sb-roscoff.fr
6	UNIVERSITY OF LIMERCK	Damien Thompson Lecturer damien.thompson@ul.ie
7	DESIGNER ENERGY	Ely Morag CTO Designer Energy ely@designerenergy.net Alon Karpol alon@designerenergy.net
8	ABENGOA BIOENERGIA NUEVAS TECNOLOGIAS SA	Eva Sánchez R&D Engineer eva.sanchez@bioenergy.abengoa.com
9	BIOPOLIS SL	Marta Tortajada Biotechnology lab head. marta.tortajada@biopolis.es Beatriz Álvarez Molecular Biology lab Manager Beatriz.alvarez@biopolis.es

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Introduction

This report describes mainly the project activity carried out by the CSIC in the completion of Task 10.2 of the *CellulosomePlus* project. The deliverable for Task 10.2 is the project webpage as well as this formal document. This document provides an overview of the project activity corresponding to this task and the website itself and the press release announcing the creation of the consortium and the start of the project.

The purpose of this task is to inform the general public on the objectives and activities of the project and to store, freely available, dissemination material such as newsletters, public reports and deliverables, and publications. The purpose of writing and circulating a press release at the start of the project was to enable external professionals working in biotechnology and new sources of energy to know about the *CellulosomePlus* initiative, and hopefully to attract the interest in following the activities of this coordination action.

CellulosomePlus Public website

The *CellulosomePlus* public website (www.cellulosomeplus.eu) is a major dissemination tool intended to facilitate the spread of project's information to different stakeholder groups: 2nd generation biofuel industry members, policy makers, biofuel international associations and professional organizations. It is the core element of the external communication strategy of *CellulosomePlus* project.

The *CellulosomePlus* public website has been prepared by CSIC, Project Coordinator and leader of WPs 1 and 10. The website is hosted and maintained by the company Web4Bio, as part of an activity sub-contracted by CSIC to this company. The website has been designed according to "EU project Websites – Best Practice Guidelines (August 2009)".

The *CellulosomePlus* public web site is a key element of the project's dissemination strategy.

This site will:

- Ensure the visibility of the project.
- Facilitate the diffusion of the project's results.
- Promote their exploitation.

The website provides a basic set of information about the project and will be regularly updated with scientific results, findings and achievements. Positioning of the site will be increased through active

links (websites of CellulosomePlus partners and of relevant EU projects / institutions and within the stakeholder network of national relays) and by targeting appropriate keywords for each page of the CellulosomePlus website.

The information contained in the project website is likely to be valuable even after the project has finished. Therefore, if funding is available the consortium would ensure that the website will continue to exist after the project funding has finished and that bookmarks and published URLs will continue to work.

CellulosomePlus Press release

The first draft of the press release was circulated among all the partners by the coordinator before the kick-off meeting. This action enabled discussion of the document during the same event and led the partners to send their feedback afterwards. The final document is annexed to this deliverable report, and was uploaded in the *CellulosomePlus* webpage:

[http://cellulosomeplus.eu/en/page.cfm?id=60&title=news-\(newsletter\)#.U9pJAeN_vTo](http://cellulosomeplus.eu/en/page.cfm?id=60&title=news-(newsletter)#.U9pJAeN_vTo)

After the publication of the press release, the document has been distributed among the consortium partners for international distribution, and subsequently, has been published in different webpages in Spain.

A. Local distribution in Spain:

Madrid+D: First R&D dissemination webpage in Spain.

<http://www.madrimasd.org/informacionidi/noticias/noticia.asp?id=60305>

AENOR. Spanish association of standardization and normalization.

http://www.aenor.es/aenor/normas/normas/normas_idi.asp#.U9pLkuN_vTo

FISICA HOY

<http://www.fisicahoy.com/noticia/obtencion-de-bioetanol-a-partir-de-residuos-urbanos-organicos>

PAS Cantabria Infonet

<https://pas2.cantabria.es/infonet/noticia.asp?id=506901&palabra=cellulosomeplus>

WEB4BIO

<http://www.web4bio.com/es/portfolio-web.html>

B. European distribution.

Cordis wire:

http://cordis.europa.eu/search/result_en?q=cellulosomeplus

University of Limerick, Ireland.

<http://www.ul.ie/news-centre/news/biofuel-energy-solutions-investigated-by-ul-researchers>

IFPAN, Poland.

http://info.ifpan.edu.pl/ACTIVITY/Press_release_launch_of_CellulosomePlus_draft_V1.pdf

Biofuelsdigest.

<http://www.biofuelsdigest.com/bdigest/2014/03/12/university-of-limerick-leads-eu-project-to-improve-biomass-processing/>

Agriland, Ireland.

<http://www.agriland.ie/news/biofuel-energy-solutions/>

Buysfan

<http://buysfan.com/2/university-of-limerick-leads-eu-project-to-improve-biomass-processing/13/>

University of München

<http://www.en.uni->

[muenchen.de/about_lmu_alt/research/collaborations/eu_proj/7frp/cooperation/en_7frp_co_nano/index.html](http://www.en.uni-muenchen.de/about_lmu_alt/research/collaborations/eu_proj/7frp/cooperation/en_7frp_co_nano/index.html)

The carbon capture report:

http://biofuels.carboncapturereport.org/cgi-bin//dailyreport_showlist?DATE=2014-03-13&field=blogposts&norm=87

Saving Gas:

<http://savgas.com/university-of-limerick-leads-eu-project-to-improve-biomass-processing/>

Green Energy Investing

<http://greenenergyinvesting.net/innovations-in-biofuel-energy-solutions>

The press release document is annexed to this deliverable report, in both versions Spanish and English.

ANNEX I: *CellulosomePlus* press release (English)



CELLULOSOMEPLUS PROJECT – EU/FP7

PRESS RELEASE #1

A 4-year innovative research and development project to exploit new technologies to add value to the process of biomass deconstruction for industrial applications, particularly in the energy market, has received funding support of 4M Euro from the European Union under the EU FP7.

The “CELLULOSOMEPLUS” project commenced on 1st November 2013, supported by a strong public-private consortium dedicated to “Boosting Lignocellulose Biomass Deconstruction with Designer Cellulosomes for Industrial Applications”. The *CellulosomePlus* consortium partners are all leaders in their specific fields: Project co-ordinator and specialist in the characterization of proteins by molecular-biophysical approaches (Instituto Cajal-CSIC, Spain); and specialists in a wide variety of fields including the analysis of substrates, enzymes and Designer Cellulosomes (Weizmann Institute of Science, Israel); the characterization of protein interactions (Ludwig-Maximilians-Universitaet of Muenchen, Germany); coarse-grained modeling (Instytut Fizyki Polskiej Akademii Nauk, Poland); atomic-scale modeling (University of Limerick, Ireland); structural characterization (Centre National de la Recherche Scientifique, France); enzymatic activity monitoring (Designer Energy LTD, Israel); innovative technology solutions for sustainability in the energy and environment sectors (Abengoa Bioenergias Nuevas Tecnologías, S.A., Spain) , preindustrial scaling-up (Biopolis, S.A., Spain), and technical support for standardization aspects (AENOR, S.A., Spain, subcontracted).

The major bottleneck for plant biomass processing is fibre saccharification: the conversion of plant cell wall lignocellulosic biomass into fermentable sugars en route to production of value-added chemicals, such as second generation biofuels. Some microbes enhance this step by using natural self-assembling proteinaceous nanocatalysts known as cellulosomes, a Lego-like assembly of enzymes with high degradation efficiency. *CellulosomePlus* targets rational design of optimized cellulosomes to overcome this problem. Cost-effective manufacture of potent designer cellulosomes would allow efficient production of biofuels from low-value raw materials like the organic fraction of municipal solid waste, inedible parts of plants or industrial residues (which are all renewable, sustainable and inexpensive). The consortium will characterize the physicochemical and structural properties (including mechanostability) as well as interactions of enzymes and scaffolds from natural cellulosomes and non-

cellulosomal components. In parallel, the consortium will characterize the municipal waste (organic fraction of municipal solid waste) and will develop improved assays to reliably follow cellulosomal enzymatic activity. The acquired knowledge will be complemented with rapid computational multi-scale modelling at the atomic and supramolecular levels for testing and predictions. Experimental and theoretical knowledge from this combined multidisciplinary approach will be then integrated to design improved cellulosomes for cost-effective saccharification and subsequent biofuel production. Finally, the production of the optimized cellulosomes (and the process involved) will be scaled up to preindustrial scale to demonstrate their viable commercial production. These results will be patented, and a roadmap will be drawn up towards future standardization of the process.

To kick off the *CellulosomePlus* activities, a workshop gathering of all participating members has been held on the 16th of January in Madrid in the headquarters of CSIC, where all the participants discussed and refined the objectives of *CellulosomePlus* and actively explored new ideas covering all aspects of the project. With over 25 participants, this meeting provided an overview of the organization and paved the way for the future of *CellulosomePlus*.

The *CellulosomePlus* coordinator Mariano Carrión-Vázquez from the Instituto Cajal-CSIC, Spain, said that this meeting has been an invaluable opportunity for the consortium members to meet each other in an established contractual framework, and thus examine together in detail the various features of this ambitious program. Indeed, this and future *CellulosomePlus* workshops were designed to cover all aspects of the project and act as hubs where all of the participants can meet to efficiently coordinate their activities and potentiate their synergistic activities.

Contact:

CellulosomePlus coordinator: mcarrion@cajal.csic.es

CellulosomePlus communication: oscar.salazar@cajal.csic.es

ANNEX II: CellulosomePlus press release (Spanish).



PROYECTO CELLULOSOMEPLUS – EU/FP7

NOTA DE PRENSA#1

Un innovador proyecto de investigación de 4 años de duración, basado en el desarrollo de nuevas tecnologías para el aprovechamiento y deconstrucción de biomasa para aplicaciones industriales en el sector de las energías renovables, ha recibido un apoyo financiero de 4 millones de euros de la Unión Europea dentro del Séptimo Programa marco de Investigación y Desarrollo.

El proyecto CELLULOSOMEPLUS comenzó el pasado 1 de noviembre del 2013 con el apoyo de un fuerte consorcio público-privado dedicado al impulso de la deconstrucción de biomasa de lignocelulosa mediante el uso de *celulosomas* para aplicaciones industriales. Todos los miembros del consorcio *CellulosomePlus* son líderes en sus áreas específicas de investigación: el coordinador del proyecto y especialista en la caracterización por biofísica molecular de las proteínas (*Instituto Cajal – CSIC, España*) y otros expertos en diferentes disciplinas que incluyen el análisis de sustratos, enzimas y celulosomas (Weizmann Institute of Science, Israel), caracterización de interacciones entre proteínas (Ludwig-Maximilians-Universität Munich, Alemania), modelado molecular simplificado (Instytut Fizyki Polskiej Akademii Nauk, Polonia), modelado molecular a escala atómica (Universidad de Limerick, Irlanda), caracterización estructural (Centre National de la Recherche Scientifique, Francia), monitorización de la actividad enzimática (Designer Energy Ltd., Israel), desarrollo de soluciones tecnológicas innovadoras en los sectores de energía y medioambiente (Abengoa Bioenergías Nuevas Tecnologías, S. A., España), escalado preindustrial (Biopolis, S. L., España) y apoyo técnico en aspectos de estandarización.

El mayor problema actual para procesamiento de la biomasa vegetal es la conversión de la pared celular de la biomasa lignocelulósica en azúcares fermentables (proceso de sacarificación), paso intermedio en la producción final de compuestos químicos con valor añadido, como los biocombustibles de segunda generación. Algunos microorganismos tienen la capacidad de mejorar este paso mediante la producción de complejos nanocatalíticos de proteínas auto-ensamblables (el celulosoma, una especie de Lego® molecular de enzimas que posee un alta eficiencia).

El proyecto *CellulosomePlus* se ha focalizado en el diseño racional de celulosomas optimizados para superar este problema. La fabricación a bajo coste de potentes celulosomas de diseño permitiría una producción eficiente de biocombustibles a partir de materias primas de bajo valor, como la fracción

orgánica de las basuras urbanas, las partes no comestibles de las plantas y los residuos industriales, todos ellos renovables, sostenibles y baratos.

En el proyecto está prevista la caracterización de las propiedades físico-químicas y estructurales del celulosoma, incluyendo estudios de mecano-estabilidad de las proteínas, como de las interacciones entre las enzimas del complejo y la proteína ensambladora a partir de celulosomas naturales y componentes no celulosomales. Simultáneamente se van a caracterizar los sustratos provenientes de los mencionados residuos urbanos y se van a desarrollar ensayos mejorados para monitorizar de forma precisa la actividad enzimática del celulosoma. El conocimiento adquirido será complementado con un rápido modelado molecular multi-escala a nivel atómico y supramolecular para realizar comprobaciones y predicciones. El conocimiento teórico y experimental que se obtenga a partir de esta aproximación multidisciplinar combinada será integrado en el diseño de celulosomas mejorados para la obtención de un proceso de sacarificación de bajo coste y la posterior producción de biocombustibles. Finalmente, el proceso de producción de celulosomas optimizados (y todo el proceso involucrado) será escalado a escala preindustrial para demostrar su producción comercial viable. Todos los resultados obtenidos van a ser objeto de patente, elaborándose asimismo una hoja de ruta para la futura estandarización del proceso.

Con objeto de lanzar a las actividades del consorcio *CellulosomePlus* celebró el pasado 16 de Enero en la sede central del CSIC, Madrid, un taller específico donde todos los participantes del consorcio discutieron y refinaron los objetivos del proyecto, explorándose nuevas ideas para cubrir todos los aspectos del mismo. Con una asistencia de más de 25 participantes, esta reunión permitió el establecimiento de las estructuras científicas y de gestión del consorcio, y se definieron las acciones clave a seguir a lo largo del proyecto. En dicha reunión, el coordinador del proyecto *CellulosomePlus*, el Dr, Mariano Carrión Vázquez, del Instituto Cajal-CSIC, señaló que la reunión ha supuesto una oportunidad muy valiosa para que los miembros del consorcio se conozcan e interaccionen en el marco contractual, examinando en detalle los diferentes aspectos de este ambicioso proyecto. De hecho este taller (y los futuros que se celebren en el contexto del proyecto) ha sido diseñado para cubrir todos los aspectos del proyecto y servir como foro donde todos los miembros coordinen de manera eficaz todas sus actividades y potencien sus sinergias.

Contacto:

Coordinador del proyecto CELLULOSOMEPLUS: mcarrion@cajal.csic.es

Comunicación del proyecto CELLULOSOMEPLUS: oscar.salazar@cajal.csic.es