



## CELLULOSOMEPLUS PROJECT – EU/FP7

### PRESS RELEASE #1

A 4-year innovative research and development project to exploit new technologies to add value to the business 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 1<sup>st</sup> 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 top-notch 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) and preindustrial scaling-up (Biopolis, S.A., Spain).

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 like the so-called 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. This 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 a highly 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 all participating members has been held last 16 January in Madrid in the headquarters of CSIC, where all the participants refined the objectives of *CellulosomePlus*, and actively explored new ideas covering all aspects of the project. With over 25 participants, this meeting certainly led to draw a picture of the organization, and paved the way for *CellulosomePlus* future.

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 dig into the actual matter. Indeed, this and future *CellulosomePlus* workshops were designed to cover all aspects of the project and act as hubs where all stakeholders can meet to efficiently coordinate their activities and potentiate their synergies.

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