ECO-BIO 2018

Team up to accelerate the global bioeconomy

4-7 March 2018 | Dublin, Ireland

Programme Booklet

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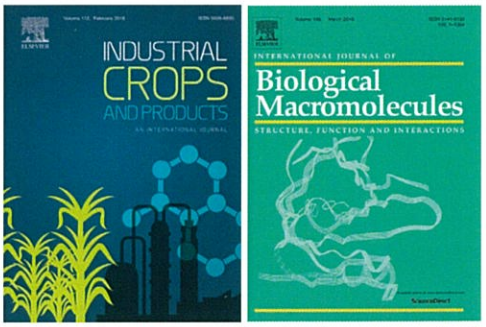

www.elsevier.com/eco-bio-conference

Sunday 04 March 2018				
17:00-18:00	Registration | *Room: Hall 3 Foyer*			
18:00-19:00	Welcome Reception | *Room: Hall 3*			
Monday 05 March 2018				
Room	*RDS Concert Hall*			
08:30-09:30	**Elsevier publishing workshop: Understanding and Benefiting from the Publishing Process**			
09:30-10:20	**Opening session - Collaboration: The key to success**			
10:20-11:00	**[PL.01] No time to waste: Accelerating bio-based innovation to solve today's societal challenges**			
Room	*Serpentine Hall/ Hall 3*			
11:00-11:30	Refreshment Break			
Room	*RDS Concert Hall*	*Dodder A*	*Dodder B*	*Lansdown Room*
11:30-13:00	**Track 1: Science Discovery**	**Track 2 (industrial): Technological development**	**Track 3: Impact assessment of biobased solutions**	**Track 4: Innovation and valorisation**
Session 1	**New feedstock**	**Pre-treatment**	**Ecological aspects (soil, water, human, climate)**	**Valorisation of lignin**
Room	*Serpentine Hall/ Hall 3*			
13:00-14:00	Lunch Break			
14:00-15:30	**Poster Session 1**			
Room	*RDS Concert Hall*	*Dodder A*	*Dodder B*	*Lansdown Room*
Session 2	**Industrial microbiology**	**Renewable products**	**Soil and crop management, nutrient cycles**	**Biobased in the context of other renewables**
Room	*Serpentine Hall/ Hall 3*			
17:00-17:30	Refreshment Break			
Room	*RDS Concert Hall*			
17:30-19:00	Forum discussion 1: Bio jet fuels			
Tuesday 06 March 2018				
Room	*RDS Concert Hall*			
09:00-09:50	[PL.02] To be confirmed at the time of print			
09:50-10:40	**[PL.03] RenovaBio: A Brazilian vector to boost the development of the world's Bioeconomy**			
Room	*Serpentine Hall/ Hall 3*			
10:40-11:15	Refreshment Break			
Room	*RDS Concert Hall*	*Dodder A*	*Dodder B*	*Lansdown Room*
Session 3	**Synthetic Biology**	**Bioenergy**	**Social, environmental and economic impacts**	**Start-ups/SME's**
Room	*Serpentine Hall/ Hall 3*			
12:45-14:00	Lunch Break			
14:00-15:30	**Poster Session 2**			
Room	*RDS Concert Hall*	*Dodder A*	*Dodder B*	*Lansdown Room*
Session 4	**Bioactive compounds from nature**	**CO/CO2 as feedstock**	**Biomass supply**	**The value of specialty chemicals**
Room	*Serpentine Hall/ Hall 3*			
17:00-17:30	Refreshment break followed by dinner			
18:30-21:30	**Conference Dinner** |The Guinness Storehouse			
Wednesday 07 March 2018				
Room	*RDS Concert Hall*			
09:00-10:00	**Forum discussion 2: Impact of the biobased economy on the environment, ecology and ecosystem**			
10:00-10:40	**[PL.04]: The coming of age of lignin-first biorefinery**			
Room	*Serpentine Hall/ Hall 3*			
10:40-11:15	Refreshment Break			
Room	*RDS Concert Hall*	*Dodder A*	*Dodder B*	*Lansdown Room*
Session 5	**Metagenomics and mining, computational engineering**	**Biorefinery**	**Policy and public perception**	**Natural materials and fibers**
12:45-13:15	**Closing ceremony and Poster award**			

[P1.16]	**Does sugarcane bagasse ash modify soybean morphology and nutrient allocation?** V. Dombinov*[1], W.J. Zang[2], H. Poorter[1], M. Watt[1], N.D. Jablonowski[1], S.D. Schrey[1], *[1]Institute of Bio- und Geosciences, Germany, [2]Instituto Federal de Goiás IFG, Brazil*
[P1.17]	**Innovations in fibre-based packaging, wood construction and biochemicals - solution for industry renewal towards forest-based bioeconomy?** A. Toppinen*[1], J. Korhonen[1], S. Berghäll[1], M. Ollikainen[1], J. Miettinen[1], M. Autio[1], E. Kylkilahti[1], L. Linnanen[2], M. Mikkilä[2], A. Tuppura[2], *[1]University of Helsinki, Finland, [2]Lappeenranta University of Technology, Finland*
[P1.18]	**Identification of PPAR active biomolecules from Vietnamese natural plant and fungal biomass** N.L. Pham*[1], T.C.H. Dang[1], H. Besselink[2], A. Brouwer[2,3], B. van der Burg[2], *[1]Vietnamese Academy of Science and Technology, Viet Nam, [2]BioDetection Systems b.v, The Netherlands, [3]Vrije Universiteit, The Netherlands*
[P1.19]	**Biorefinery concept of birch bark processing - value added products and ecological biocomposites** J. Rizhikovs*, P. Brazdausks, A. Paze, R. Tupciauskas, J. Grinins, M. Puke, A. Plavniece, *Latvian State Institute of Wood Chemistry, Latvia*
[P1.20]	**Pretreated hemp shives: Conversion possibilities into levoglucosan and levoglucosenone** J. Rizhikovs*, P. Brazdausks, G. Dobele, V. Jurkjane, A. Paze, K. Meile, M. Puke, *Latvian State Institute of Wood Chemistry, Latvia*
[P1.21]	**Ensiling of the pulp fraction after biorefining of grass into pulp and protein juice** S.U. Larsen*[1,2], M. Ambye-Jensen[2], H. Jørgensen[3], *[1]Danish Technological Institute, Denmark, [2]Aarhus University, Denmark, [3]University of Copenhagen, Denmark*
[P1.22]	**Effect of nitrogen fertilization on protein yield, protein extractability and amino acid composition when biorefining tall fescue** S.U. Larsen*[1,4], H. Jørgensen[2], C. Bukh[3], J.K. Schjørring[2], *[1]Danish Technological Institute, Denmark, [2]University of Copenhagen, Denmark, [3]Thermo Fischer Scientific, Denmark, [4]Aarhus University, Denmark*
[P1.23]	**Impact of heat treatment during the processing of lignin precursor fibres** A. Beaucamp*, M. Culebras, Y. Wang, M.N. Collins, *University of Limerick, Ireland*
[P1.24]	**Use of near infrared spectroscopy for the rapid low-cost analysis of a wide variety of lignocellulosic feedstocks** D.J. Hayes, *Celignis Limited, Ireland*
[P1.25]	**Lignocellulosic pre-treatment augmentation by White-rot fungi** T.E. de Boer*[1], A. Dao[1], P. Harmsen[3], B. Brouwer[1,2], *[1]MicroLife Solutions, The Netherlands, [2]BioDetection Systems, The Netherlands, [3]WUR-FBR, The Netherlands*
[P1.26]	**Integration of next generation biosurfactant production into biorefinery processes** J. Fritsch*[1,2], J. Büchs[1], L. Regestein[1,2], *[1]RWTH Aachen University, Germany, [2]Bioeconomy Science Centre (BioSC), Germany*
[P1.27]	**Solids loading influence on brewer's spent grain saccharification for production of butanol by way of *C. beijerinckii* DSM 6422** P.E. Plaza, M. Coca, G. González-Benito, S. Lucas, M.T. García-Cubero*, *University of Valladolid, Spain*
[P1.28]	**Lignin-based Bio-PET blends as carbon fibre precursor produced by a melt spinning process** Y. Wang*, A. Beaucamp, M. Culebras, M.N. Collins, *University of Limerick, Ireland*
[P1.29]	**Development of a social impact indicator to evaluate workers' status: The case of ethanol biorefineries in Brazil** A. Souza*[1], M.D.B. Watanabe[1], O. Cavalett[1], C.M.L. Ugaya[3,4], M. Cunha[2], A. Bonomi[1], *[1]Brazilian Bioethanol Science and Technology Laboratory (CTBE/CNPEM), Brazil, [2]University of Campinas (Unicamp), Brazil, [3]Federal University of Technology -Paraná (UTFPR), Brazil, [4]CNPq fellow, Brazil*
[P1.30]	**Re-cycling nutrients and organic matter from agro-industry wastewater in rural areas using adsorbents** J. Lacuesta*, S. Gutiérrez Parodi, *Univeristy of the Republic, Uruguay*
[P1.31]	**Using plant based materials to form polymer encapsulated spheres** S.H. Kalluru*, E.W. Cochran, *Iowa state university, USA*
[P1.32]	**Production of polyhydroxyalkanoates in the non-sulphur purple bacterium Rhodospirillum rubrum S1H** G. Bayon-Vicente*[1], B. Leroy[1], R. Onderwater[2], R. Wattiez[1], *[1]University of Mons, Belgium, [2]Biotech Materia Nova, Belgium*
[P1.33]	**The EPS production by Cyanothece sp. PCC 7822 through an adapted metabolism** C. Van Camp*, R. Wattiez, *University of Mons, Belgium*
[P1.34]	**Valorisation of perennial plant biomass by OrganoCat pulping** H. Klose*[1,2], P.M. Grande[2,3], S. Schrey[2,3], N.D. Jablonowski[2,3], M. Dama[2,4], M. Pauly[2,4], D. Weidener[2,1], W. Leitner[1,5], P. Dominguez de Maria[6], U. Schurr[2,3], *[1]RWTH Aachen University, Germany, [2]Bioeconomy Science Center, Germany, [3]Forschungszentrum Jülich, Germany, [4]Heinrich Heine Universität Düsseldorf, Germany, [5]Max-Planck-Institut für Kohlenforschung Mühlheim an der Ruhr, Germany, [6]Sustainable Momentum, Spain*

Eco Bio 2018 | Poster Programme

[P1.35]	**Carbon dioxide explosion as a pre-treatment for lignocellulosic biomass** L. Tian[1], M. Mushtaq[1], L. McNea[1], K. VanOverloop[1], X. Hao[2], A. Dutta[3], B. Gilroyed*[1], *[1]University of Guelph Ridgetown Campus, Canada, [2]Agriculture and Agri-Food Canada, Canada, [3]University of Guelph, Canada*
[P1.36]	**Development of a sustainable biorefinery based on winemaking by-products** I. Dávila*, A. Morales, J. Labidi, P. Gullón, *University of Basque Country, Spain*
[P1.37]	**Circular economy in the wine sector: Assessment of the potential of four Portuguese grape varieties for seed oil production and by-products development** I. Afonso, A. Ferraz, A.S. Rodrigues, A.P. Vale, S. Mendes, J. Alonso, J. Domingues, M. Alves, A.C. Rodrigues*, *Polytechnic Institute of Viana do Castelo - IPVC, Portugal*
[P1.38]	**Waste utilization for pollutant retention and compost generation in small and medium scale devices** V. Willson*, F.M. Calcagno, S.P. Boeykens, N. Caracciolo, *Universidad de Buenos Aires, Argentina*
[P1.39]	**Microalgal photobiorrefinary based on *Spirulina* grown in medium supplemented with bioenergy industry waste** E.G. Morais*, J. Corá, M.G. Morais, J.A.V. Costa, *Federal University of Rio Grande, Brazil*
[P1.40]	**L-asparaginase production and lipid accumulation by the psychrotolerant yeast *Leucosporidium scottii*** I.S. Moguel[1,2], C.K. Yamakawa[2], A. Pessoa Jr[1], S.I. Mussatto*[2], *[1]University of São Paulo, Brazil, [2]Technical University of Denmark, Denmark*
[P1.41]	**Commercializing the lignocellulosic biorefinery forbioethanol and lactic acid production Onsite cellulase and evolutionaryadaptation** A.S. Qureshi*[2], I. Khushk[2], M. Naqvi[1], C.H. Ali[3], A. Ahmad[4], I. Ibrahim[1], *[1]Mälardalen University, Sweden, [2]University of Sindh, Pakistan, [3]UET, Pakistan, [4]MNS UET, Pakistan*
[P1.42]	**The algae testbed public private partnership (atp[3]): A platform for engagement and access to industry, national lab and academic expertise, and world-class algal r&d facilities at the food-energy-water nexus** J.A. McGowen, *Arizona State University, USA*
[P1.43]	**How sustainable is the production of *Miscanthus* x *giganteus* Greef et Deu in sewage sludge contaminated soils?** A.L. Fernando, *Universidade NOVA de Lisboa, Portugal*
[P1.44]	**Chemical pretreatment of brewer`s spent grain (BSG) for ABE solvents production by *C. beijerinckii* fermentation** M. Fernández-Delgado, P.E. Plaza, G. González-Benito, S. Lucas, M. Coca, M.T. García Cubero*, *University of Valladolid, Spain*
[P1.45]	**Improvement of food-waste dark fermentation by Clostridium enriched microbial consortia** J. Ortigueira*[1,3], L. Martins[2], C. Silva[3], P. Moura[1], *[1]Laboratório Nacional de Energia e Geologia, Portugal, [2]Faculdade de Ciências da Universidade de Lisboa, Portugal, [3]Instituto Dom Luiz, Faculdade de Ciências, Portugal*
[P1.46]	**Development of perennial grain cultivars targeting the needs of the biobased economy** K.M. Murphy, *Washington State University, USA*
[P1.47]	**Decomposition of untreated wood and simultaneous ethanol production under solid-state fermentation by the fungus *Phlebia radiata*** H.K. Mattila*, M. Mäkinen, A. Hartikainen, N. Risulainen, T. Lundell, *University of Helsinki, Finland*
[P1.48]	**Effect-based safety assessment of bio-based chemicals and chemical mixtures: A case study on bio-based plastics** B. van der Burg*[1], B.M.A. van Vugt[1], M. Naderman[1], D. van Es[2], A. Brouwer[1,3], *[1]BioDetection Systems bv, The Netherlands, [2]Wageningen UR, The Netherlands, [3]VU University, The Netherlands*
[P1.49]	**Lignin-based carbon / clay hybrid materials as reinforcement of polymer composites** J. Park*, H. Roh, *Seoul National University, Republic of Korea*

Poster Session 2

Tuesday 06 March 2018 14:00-15:30

[P2.01]	**The FUNGUSCHAIN project; valorisation of residues of mushroom cultivation to obtain high value products** B. van der Burg, *BioDetection Systems BV, The Netherlands*
[P2.02]	**Large scale algal oil production for bio-fuel use: Techno-economic analysis and evaluation** A. Roussos*[1], Y. Stavropoulos[1], A. Koulouris[2], D. Petrides[3], *[1]Intelligen Europe, Greece, [2]Alexander Technological Education Institute of Thessaloniki, Greece, [3]Intelligen Inc., USA*
[P2.03]	**Evaluation of ethanol production from renewable cellulosic resources using process simulation tools** A. Roussos*[1], Y. Stavropoulos[1], A. Koulouris[1], D. Petrides[1], *[1]Intelligen Europe, Greece, [2]Alexander Technological Education Institute of Thessaloniki, Greece, [3]Intelligen Inc., USA*

Title:

Improvement of food-waste dark fermentation by *Clostridium* enriched microbial consortia

Authors & affiliations:

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Abstract:

Food waste (FW) is defined as "raw or cooked food discarded at any point of the food production and supply line, encompassing manufacturing/production, distribution, wholesale/retail, food service and household preparation" [1]. The efficiency in food production/processing/consumption is unlikely to increase up to the point where FW is completely eliminated. Therefore, the disposal of inevitable FW should be oriented for the generation of additional value. Food waste is mainly composed of carbohydrates, proteins, fats, among other functionalised compounds [2]. These can be used as substrate in biochemical processes, such as dark fermentation (DF), for the production of energy vectors, electricity and chemical precursors for bioplastics [3].

This study evaluated FW conversion through DF and tested the effect of adding a H_2-producing microorganism as process biocatalyst. The FW samples were prepared and characterised as described previously [4]. Batch fermentations were performed in a 1.65 L bioreactor, operated at 37 °C, pH ≥ 5.5, containing 100 g of FW (20 g/L total sugars) [4]. *Clostridium butyricum* DSM 10702 was added as biocatalyst (5% v/v) under non-sterile conditions, and the cumulative H_2 production reached 1.7 L/L, with a H_2 productivity and production yield of 146 mL/L.h and 37.5 mL/g, respectively. However, the cumulative H_2 production decreased by 60.5% over the sterile fermentations. To overcome this problem, by reducing the sample contamination and enhancing the effect of the biocatalyst addition, a stage of FW pretreatment by microwave, acid addition, or microwave and acid was introduced.. The result was a decrease of 43, 49 and 68% c.f.u., respectively, of the pretreated *vs* untreated FW sample. The most effective pretreatment was applied to FW and the H_2 production was compared. The performed study aims to improve the efficiency and possible scalability of FW biochemical conversion, keeping pretreatment conditions (handling/processing) simple enough to be perform at the household level.

[1] B. Lipinski, C. Hanson, J. Lomax, L. Kitinoja, R. Waite, T. Searchinger, Reducing food loss and waste, World Resources Institute Working Paper, June (2013) 1-40.
[2] N.B.D Thi, Food Waste towards bio-energy: management policy and methodologies, Int. J. Environ. Sci. Dev. (2016) 7, 763-767.
[3] S.V.Mohan, G.N. Nikhil, P. Chiranjeevi, C.N. Reddy, M.V. Rohit, A.N. Kumar, O. Sarkar, Waste biorefinery models towards sustainable circular bioeconomy: Critical review and future perspectives, Bioresource technology, September (2016) 215, 2-12.
[4] J. Ortigueira, C. Silva and P. Moura, Food-waste to energy: potential for fermentative hydrogen production, WASTES: Solutions, Treatments and Opportunities, 4th International Conference, September 25 – 26th 2017.