PROGRAMME AND ABSTRACT BOOK

efb | european federation of biotechnology

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Programme

Tuesday 4th October 2022	
09:00-10:30	**Publications workshop** PLATINUM SPONSOR: ELSEVIER The workshop is designed to help early career biotechnologists get their results published in international journals. Participants will be invited to submit manuscripts for a thematic issue of the EFB Journal New Biotechnology on the development of Valuable Products from Renewable Resources. • **Introduction to EFB Journal New Biotechnology: impact factor 6.49** • **Dan Cheng**, Publisher of "New Biotechnology" • ***Why papers are rejected: how to increase the chance of acceptance,* Mike Taussig,** Chief Editor. "New Biotechnology" • ***How to work with editors and reviewers,* Steve Euston,** Chief Editor, "Bioeconomy Journal" • ***Publications ethics*, Anthony Newman,** Senior publisher Elsevier • **Call for papers for a thematic issue "Valuable products from renewable resources"** • Questions to the Editors and Publisher • **Introduction to EFB Journal New Biotechnology: impact factor 6.49** • **Dan Cheng**, Publisher of "New Biotechnology" • ***Why papers are rejected: how to increase the chance of acceptance,* Mike Taussig,** Chief Editor. "New Biotechnology" • ***How to work with editors and reviewers,* Steve Euston,** Chief Editor, "Bioeconomy Journal" • ***Publications ethics*, Anthony Newman,** Senior publisher Elsevier • **Call for papers for a thematic issue "Valuable products from renewable resources"** • Questions to the Editors and Publisher

Tuesday 4th October 2022	
11:00-13:00	**Harvesting renewable marine resources** organised by the EFB Environmental Biotechnology Division

Chairs: **Marlen Vasquez**, Cyprus University of Technology (CY); **Fabio Fava**, BLUEMED, University of Bologna (IT)

- **Introduction**
- **Keynote lecture: *Marine biotechnology,* Margrét Geirsdóttir**, MATIS (IS)
- **Invited talk: *Marine biodiscovery: pharmacological and medical applications*, Olivier Thomas,** NUI Galway (IE)
- **Invited talk: *New proteins and ingredients for aquaculture from renewable sources*, Olafur Fridjonsson,** MATIS (IS)
- **Invited talk: *Isolation of novel antibiotics and other natural compounds,* Fernando Reyes,** Fundación Medina (ES)
- **Keynote lecture: *Efficient processing of seaweeds for products,* Kamalesh Prasad,** Senior Principal Scientist, CSIR-Central Salt & Marine Chemicals Research Institute (IN)
- **Keynote lecture: *Seaweed biomass refinery for bioenergy production,* Michele Stanley,** Scottish Association for Marine Science (UK)
- Q + A; invitation to establish confidential biopartnering meetings

Tuesday 4th October 2022	
14:00-16:10	**"Valuable products from renewable resources"** organised by the EFB Bioengineering and Bioprocessing Division

Chairs: **Cecília A. Roque**, FCT-NOVA University of Lisbon (PT);
Neil Dixon, University of Manchester (UK)

- **Introduction**
- **Keynote lecture:** *Carbon capture***, Allan Kent Nielsen,** Novozymes (DK)
- **Invited lecture:** *Industrial scale biocatalytic production of (R)-1,3-butanediol from renewable resources using a multi-enzyme cascade***, Osama Mahmoud,** Enzymaster Deutschland GmbH (DE)
- **Invited lecture:** *Selection of a* Yarrowia lipolytica *strain for production of long-chain fatty acids, defoamers and biodiesel from organic compounds of sugar cane vinasse***, Mário Lucio Lopes,** Fermentec (BR)
- **Short talk:** *Design of an enzymatic CO_2 capture and utilization process for carboxylation of phenols***, Luigi Marra**, Università degli Studi di Napoli Federico II (IT)
- **Short talk:** *Integration of carbonic anhydrase in amine scrubbing for efficient CO_2 capture of industrial emissions***, Io Antonopoulou**, Luleå University of Technology (SE)
- **Short talk:** *From CO_2 to value-added products: potential of anoxygenic photosynthetic bacteria***, André Freches**, NOVA School of Science and Technology (PT)
- **Invited lecture:** *Sustainable manufacturing of biosurfactants*, **Joana Pereira,** Holiferm (UK)
- **Invited lecture:** *Application of carbonic anhydrase for the accelerated weathering of residues from the pulp & paper industry towards CCS,* **Ayanne de Oliveira,** Luleå University of Technology (SE)
- **Short talk**: *Bacterial cellulose and Fucopol based dressings for advanced wound treatment ,* Asiyah Esmail, FCT UNL (PT)
- **Keynote lecture:** *Exploitation of industrial wastes for biopolymer and bulk chemical production,* **Maria Reis,** FCT-NOVA University of Lisbon (PT)
- Questions and answers; invitation to establish confidential biopartnering meetings

Wednesday 5th October 2022	
09:00-11:10	**"Valuable products from renewable resources"** organised by the EFB Executive Board

Chairs: **Jitka Frébortová**, CATRIN- Palacký University (CZ); **Jeff A. Cole,** EFB President (UK)

- **Introduction**
- **Short talk:** *Solid state fermentation of arabica coffee pulp (coffea arabica) using* Aspergillus sp. *to increase the extraction yield of phenolic acid*, **Muhammad Yusuf Abduh**, Institut Teknologi Bandung (ID)
- **Short talk:** *Carotenoid production by* Paracoccus spp. *using agricultural wastes via submerged fermentation*, **Weronika Pyter**, University of Warsaw (PL)
- **Short talk:** *Immobilised biocatalysts for waste valorisation,* **Sana Siddiqui,** Macquarie University, Australia
- **Short talk: V***alorization of agro-industrial wastes/by-products into high value bacterial cellulose production,* **Cátia Gil**, NOVA, Portugal
- **Invited lecture:** *Production of fragrance and flavour ingredients via fermentation,* **Matthew Styles,** Isobionics (NL)
- **Keynote lecture:** *Production of chitin and chitosan from renewable resources using fermentation: towards a circular process***, Wolfram Brück,** University of Applied Sciences Western Switzerland, HES-SO (CH)
- **Keynote lecture:** *Carbon capture and sustainable utilization***, Thomas Brück,** Technical University of Munich (DE)
- **Keynote lecture**: *A field of dreams - lignin valorisation to the world's leading chemicals,* **Christoph Wittman,** Saarland University (DE)
- Q + A; invitation to establish confidential biopartnering meetings

12:00-13:00	**Flash poster session**
13:00-14:00	**Poster session**

Wednesday 5th October 2022	
14:00-16:15	**"Valuable products from renewable resources"** organised by the EFB Executive Board in collaboration with the Biocatalysis Division
	Chairs: **Marta Woźniak**, Poznań University of Technology (PL); **Steve Euston,** Chief Editor, "Bioeconomy Journal" (UK)
	• **Introduction** • **Keynote lecture:** *Molecular basis of a CO_2-fixing enzymatic protein nanowire,* **Jan Michael Schuller,** Phillipps-University (DE) • **Invited lecture:** *Organic waste conversion into fully biodissolvable and non-toxic polymeric granulate.***, Marina Cvijanovic**, Eco Bio Croatia (HR) • **Short talk:** *Mechanistic study of enzymes used for energy saving in refining of cellulose fibers*, **Martin Nagl**, Institute of Environmental Biotechnology, University of Natural Resources and Life Sciences, Vienna (AT) • **Short talk:** Zymomonas mobilis *an emerging microbial cell factory to produce prebiotics*, **Adelaide Braga**, Universidade do Minho, Centro de Engenharia Biológica (PT) • **Short talk:** *Evaluation of the possibility of application of concrete as a carrier of humic substances extracted from the sewage sludge - the impact on soil environment*, **Justyna Michalska**, Silesian University of Technology (PL) • **Short talk:** *Design of an* Escherichia coli *strain to be used as platform for* de novo *production of flavonoid-derived compounds*, **Daniela Gomes**, Centre of Biological Engineering University of Minho (PT) • **Short talk:** *Zeolites as a platform for cellulase immobilization and application in biomass Saccharification*, **Namrata Joshi**, University of Warsaw (PL) • **Invited lecture:** *Application of supercritical CO_2 in up-stream and down-stream bioprocessing***, Nicola Collard**, Phytome (UK). • **Invited lecture:** *Bioblue Natural Absorber – the most efficient oil absorber in the world***, Guilhermo Queiroz**, Biosolvit (BR). • **Short talk:** *Polydopamine production by enzymatic pathway and enzyme reuse using aqueous biphasic systems*, **Flávia Magalhães**, CICECO - Aveiro University (PT) • **Short talk:** *Application of* in-situ *and soft-sensors for estimation of recombinant* P. pastoris *GS115 biomass concentration*, **Oskars Grigs**, Latvian State Institute of Wood Chemistry (LV)

- **Keynote lecture:** *Optimizing cell factories for xylose and lignin use in bioprocesses,* **Marie Gorwa-Grauslund**, Lund University (SE)
- **Keynote lecture:** *Utilization of rice husk waste,* **Lucia Gardossi,** Bioeconomy Journal and the EFB Biobased Materials Division Board (IT)
- Q + A; invitation to establish confidential biopartnering meetings

Design of an *Escherichia coli* strain to be used as platform for de novo production of flavonoid-derived compounds

Daniela Gomes[1,2], Joana L. Rodrigues[1,2], Ligia R. Rodrigues[1,2]

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[2] LABBELS- Associate Laboratory, Braga/Guimarães, Portugal

Flavonoids is a class of polyphenols with at least 9000 compounds with a wide range of medical and industrial applications. These compounds are hard to chemically synthesize and their extraction from plants is difficult, expensive and renders non-pure compounds. For this reason, the heterologous production of flavonoids using microbes and cheap carbon sources has emerged as a possible solution. Naringenin chalcone (NC) is considered the branching point of the flavonoids pathway to produce more complex compounds, namely prenylflavonoids, isoflavonoids, flavones, and flavonols. To produce NC, tyrosine is converted into coumaric acid (CA) by tyrosine ammonia-lyase (TAL). Then, CA is converted into coumaroyl-CoA by 4-coumarate-CoA ligase (4CL) that is further converted into NC by chalcone synthase (CHS). Herein, we designed and validated an efficient *E. coli* strain to produce NC *de novo*. Firstly, 2 TAL genes from different organisms were expressed in *E. coli* BL21, K12 MG1655 and M-PAR-121 to select the best enzyme and strain to produce CA. The highest CA production (2.54 g/L) was achieved in the tyrosine-overproducing *E. coli* M-PAR-121 strain expressing TAL from *Flavobacterium johnsoniae* (*Fj*TAL). Then, 4 different 4CL and 3 different CHS encoding genes were selected and expressed in combination with *Fj*TAL originating 12 different *E. coli* strains. The highest production of NC was achieved in the *E. coli* M-PAR-121 strain expressing *Fj*TAL, *At*4CL and *Cm*CHS (311.0 mg/L). In the future, this strain will be used as a platform to produce more complex compounds, namely prenylflavonoids.