



European Polysaccharide  
Network Of Excellence

N°48 - JANUARY 2019



***“Nature makes polysaccharides,  
EPNOE turns them into products”***

## editorial

**D**ear Readers of the EPNOE Newsletter,

I wish all of you a wonderful year 2019 for you, your family and all the persons you love. Let's hope that 2019 will see more peace in our world, food and water for the hundreds of millions of children, women and men who are suffering, and less resistance to the changes which are needed for keeping our small planet in good shape.

The EPNOE story started beginning of 2000, with a small group of enthusiastic persons willing to promote polysaccharide science. EPNOE is now a mature, well respected organization. All EPNOE members and members of the different committees can be proud of this achievement.

I made the decision to stop leading EPNOE. It is with a great pleasure and emotion that I see so many persons, including young scientists, willing to be actively engaged in the future development and to tackle new challenges. The new management team will be elected in the next few months.

I wish to thank all the persons who took care of the practical aspects of EPNOE life, and in particular Julie and Sylvie.

I will, of course, stay close to and involved in EPNOE activities.

This 48th editorial is thus my last one.

I wish EPNOE a long and fruitful life for the benefit of science. I wish all EPNOE members and followers to be successful in their professional activities.

With my best wishes



**Dr. Patrick Navard**

Coordinator of EPNOE  
Armines/Mines ParisTech/CNRS  
CEMEF - Centre for Material Forming  
Sophia-Antipolis (France)

## news

### ► Member's info



#### **Masters & PhD defenses:**

- At **IMT - Mines d'Alès, France:**

Raymond HAJJ defended his PhD thesis entitled "Grafting of phosphorus-based flame retardants on natural fibers" in collaboration between IMT - Mines Alès and the Lebanese University in November 29th, 2018 at the Lebanese University - Fanar, Lebanon.

- At **Jena University, Germany:**

- Dr. Christian Ahtel defended his PhD Thesis entitled "New cellulose solvents: Dissolution and functionalization of cellulose in triethyl-n-octylammonium chloride"

- M. Sc. Manuel Arnold defended his Master Thesis entitled "Colorimetric assay for the specific detection of Legionella pneumophila by isothermal amplification"

- At **BOKU University, Austria:**

#### **PhD defenses**

Dr. nat. techn. Sven Plappert, Assembly of Nanocellulose Building Blocks into Anisotropic Mem-branes, Gels and Aerogels (Supervisor: F. Liebner).

#### **Diploma / Master theses**

- DI Paul Jusner, Environmentally Benign Esterification of Lignocelluloses (Supervisors: T. Rosenau, M. Beaumont).

- DI Franz-Josef Pichler, Decolouration of Lignin (Supervisors: S. Böhmendorfer, A. Potthast, T. Rosenau).

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## News "Member's info"

### Awards

**Assist. Prof. Dr. Selestina Gorgieva** from Institute of Engineering Materials and Design, University of Maribor, become Slovenian National Chapter for Young Scientist Forum in frame of European Society for Biomaterials (ESB). <http://www.esbiomaterials.eu/Cms/Content/24>.

She also receive the **Julia Polak European Doctorate Award** on the 28th ESB conference in Maastricht, Netherlands (9-13.9.2018).

We are pleased to inform that a group of scientists from the Institute of Biopolymers and Chemical Fibres (Poland) including: K. Wrześniewska - Tosik, T. Mik, M. Pałczyńska, D. Dębiec, R. Dziuba and J. Ryszkowska at the International Exhibition of Inventiveness and Design KIDE 2018, which took place on 07-09 December 2018 in Kaohsiung, Taiwan won the Gold Medal and the special prize "Award of Excellence", awarded by iCAN-TORONTO, CANADA for the invention "Polymer materials modified with flame retarded keratin powder".



### New comers

- At **Petru-Poni Institute, Romania:**

Raluca Ioana Baron, Supervisor: Dr. Sergiu Coseri, Topic: Polymeric structures based on polysaccharides and their applications

Madalina Elena Culica, Supervisor: Dr. Sergiu Coseri, Topic: Cellulose and its derivatives for unconventional applications

Ioana Alexandra Duceac, Supervisor: Dr. Sergiu Coseri, Topic: New polymeric networks based on functionalized polysaccharides with medical applications.

- At **University of Maribor, Slovenia:**

Lucija Jurko joined the LCPP group as PhD student (in the frame of FibreNet project H2020-MSCA-ITN-2017) working in the field of nano fibrous materials for advanced biomedical applications. Supervisor: Dr. Rupert Kargl.

Fazilet Güler joined the LCPP group as PhD student (in the frame of FibreNet project H2020-MSCA-ITN-2017) working in the field of 3D printed polymer and porous polysaccharide scaffolds for regenerative medicine. Supervisor: Dr. Tamilselvan Mohan.

- At **Jena University, Germany:**

Dipl.-Chem. Dörte Jakobi joined the group as scientific coworker. She is working in the field of regioselective etherification of cellulose in the frame of a project funded by the Swiss Innovation Agency (Innosuisse) and two companies. Those compounds will be subjected to DNP-NMR investigations in comparison with conventionally synthesized samples at EPFL in Lausanne.





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## EPNOE Conference 2019

Aveiro, Portugal

7th-11th October 2019

It is a great pleasure and privilege to welcome you to Aveiro and to the **6th EPNOE International Polysaccharides Conference** (<https://epnoe2019.sciencesconf.org/> - website opening end of January 2019) that will take place from 7th – 11th of October 2019.

This congress is an initiative of EPNOE, the Cellulose and Renewable Division of the American Chemistry Society (ACS), and the Cellulose Society of Japan (CSJ) and is being hosted in Aveiro, Portugal for the first time.

The ambition of the EPNOE International Polysaccharides Conferences is to bring together students, scientists and experts working or interested in polysaccharides related R&D topics, to disseminate results and to promote a networking platform for close interactions between academia and industry.

We are pleased to offer you an excellent scientific programme, structured in Thematic Sessions covering different areas where polysaccharides have a relevant role, co-organized by scientific experts in each field.

We hope that it will be an enjoyable event that will provide an opportunity for delegates to discuss and share knowledge, ideas and expertise with colleagues and peers.

We wish you a fruitful meeting and a pleasant stay in Aveiro!

On behalf of the organizing committee,

### Local Organizers

Carmen Freire

Manuel Coimbra

### EPNOE Association

Patrick Navard

### EPNOE-ACS-CSJ committee

Pedro Fardim

### ACS

Kevin Edgar

Steve Eichhorn

### CSJ

Tetsuo Kondo

Yoshinobu Tsujii

Hirofumi Ono



Aveiro , Portugal



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## New H2020 Marie-Skłodowska-Curie-ITN project at the University of Maribor, Slovenia

**FibreNet**

The Laboratory for Characterization and Processing of Polymers (LCPP) is part of FibreNet, a Marie Skłodowska-Curie-ITN project in the field of bio-based fibres for a duration of four years. A consortium of 15 European academic and industrial organizations collaborate in bridging the knowledge-gap between the properties of fibres and fibre-based products. The project is coordinated by the group of Prof. Pasi Kallio, Tampere University of Technology, Finland. Targeted are products with new functionalities in packaging, biomedicine, paper, board and composites. 15 PhD students are working on their own personal projects but intensively cooperate with other partners through secondments and other forms of exchange.



*First FibreNet event at Tampere University, Finland*

Six network-wide training events will educate PhD students in technical and soft skills and give them the possibility to present their results. The 2nd network-wide training event is a winter school on multi-scale characterization of bio-based fibre products held in Austria and hosted by Prof. Ulrich Hirn at the Institute of Paper, Pulp and Fiber Technology, Graz University of Technology from 11th - 15th of February 2019, with the whole consortium and all PhD students participating. The 3rd network-wide training event is a summer school on surface functionalization of bio-based fibre products held in Maribor, LCPP from 2nd - 6th of September 2019. Detailed information on the project's concept, results and latest news can be found under: <http://fibrenet.eu>.

*"This project has received funding from the European Union's Horizon 2020 research and innovation program under Marie Skłodowska-Curie grant agreement No 764713".*

This article was proposed by Rupert Kargl, Alenka Ojstršek and Karin Stana Kleinschek,  
University of Maribor, Slovenia





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## BIOACTIVE and $\mu$ -STRUCTURED COMPOSITE MEMBRANES with RELEVANCE in TREATMENT of PERIODONTAL DEFECTS

Post doc project

**Selestina GORGIEVA**

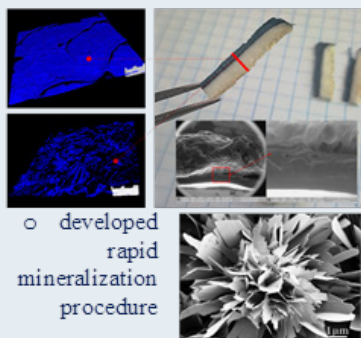
Institute of Engineering Materials and Design, Faculty of Mechanical Engineering,  
University of Maribor, Slovenia

Development of biopolymer-based, composite membranes for Guided Tissue Regeneration (GTR) treatment is post-doctoral project financed by Slovenian Research Agency (ARRS). Project objectives include systematic engineering of bio-based, functionally graded, multilayer composite to site-specific introduce the chemical (composition), structural (porosity) and mechanical triggers within a single material, which closely meet the periodontal complex tissue properties. Such membranes present supplement by means of functionality, gathering superior performance of their *state of the art* counterparts: starting from their basic barrier function, regeneration function, degradation capacity and antimicrobial function due to incorporated native antimicrobial peptide being active against periodontal disease-related pathogens.

The outcomes of project' interdisciplinary research provide valuable contribution to i) material science trough introduction of novel and systematic methodologies as well as to ii) medicine by considering the biocomposites as new GTR membranes for periodontal defects treatment and as acellular scaffolds for tissue-interfaces' regeneration. Project develop two combinations of membranes: *gelatin/chitosan/genipin* and *bacterial cellulose/gelatin/EDC*, both processed by regulated solvent- and freeze-casting procedures.

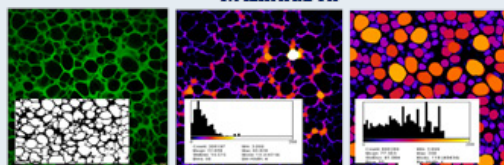
### Important project outcomes are:

- developed methodology(s) for *in situ* integration of membrane' layers and different length scale  $\mu$ -structuring

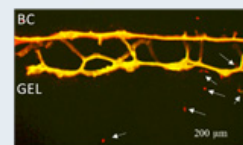


- developed rapid mineralization procedure

- new evaluation method for porosity examination



- new discovers for cell-material interaction event(s).
- inclusion of antimicrobial nisin against periodontal pathogens



Considering the devastating statistics, i.e. >8% of adults aging between 20 and 64 have periodontal disease, ~ 5% of them have moderate to severe form, correlation with other systematic diseases (diabetes, osteoporosis, cardio-, cerebrovascular and respiratory diseases) and very high cost (4<sup>th</sup> highest cost disease) the significance of improving its treatment routes could be resumed. In this regards, the up grading of conventional GTR towards simplicity, multi-functionality and cost-efficiency is highly relevant for the medical sector.

**Acknowledgement** The project (ID Z7-7169) was financially supported by the Slovenian Research Agency.



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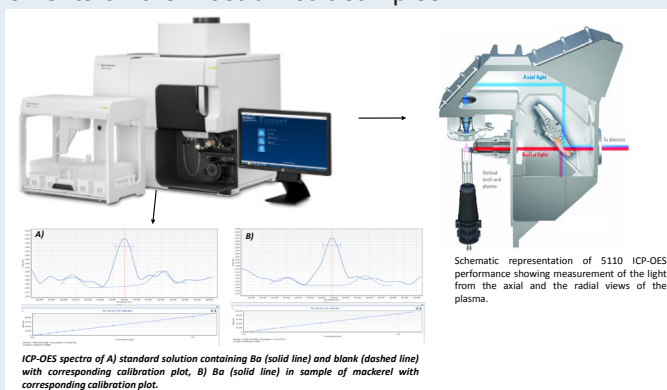
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## NEWLY AVAILABLE

# Agilent 5110 Vertical Dual View ICP-OES Faster, more accurate ICP-OES analysis without compromise

- Faster and more precise ICP-OES analysis, using less gas.
- Reduction of cost-per-analysis and more than doubled productivity.
- Measuring all wavelengths in a single measurement.
- Minimizing self-absorption and recombination interferences.
- Uncompromised robustness for axial and radial measurements with less cleaning, less down-time and less replacement torches.
- Automatically alignment of the torch and connects gases.
- Uncompromised robust measurements on the most difficult samples.
- Long-term analytical stability.



### Features:

The simple and effective torch loader mechanism automatically aligns the torch and connects gases for fast start up and reproducible performance.

Fully PC-controlled peristaltic pump with variable speed from 0-80 rpm.

All plasma related gas flows are computer controlled with high precision Mass Flow Controllers.

3 interchangeable gas control modules for supply of argon, nitrogen, and argon/oxygen blend.

Solid state RF generator: power output of 700-1500 W in 10 W increments.

Robust free running design: rapid reaction to changes in plasma load → stable and consistent power supply into plasma during sample switches of high or varying matrix.

Vertical torch enables measurements of the most challenging samples (from high matrix to volatile organic solvents).

Vertical dual view pre-optics allow axial and radial plasma viewing → providing the lowest argon consumption per sample.

Cooled Cone Interface (CCI) prevents the cooler plasma tail from being viewed by optics in axial measurement → wide linear dynamic range and low background.

A high speed, continuous wavelength coverage CDC detector with anti-blooming protection on every pixel.

### Applications:

Aqueous samples.

Organic solvents.

High salt/matrix samples.

Samples with hydrofluoric acid (HF).

Hydride and non-hydride elements including As, Se and Hg (to sub ppb levels).

**Authors:** Tanja Zidarič, Boštjan Krajnc, Tina Maver, Dušanka Mičetić Turk, Uroš Maver

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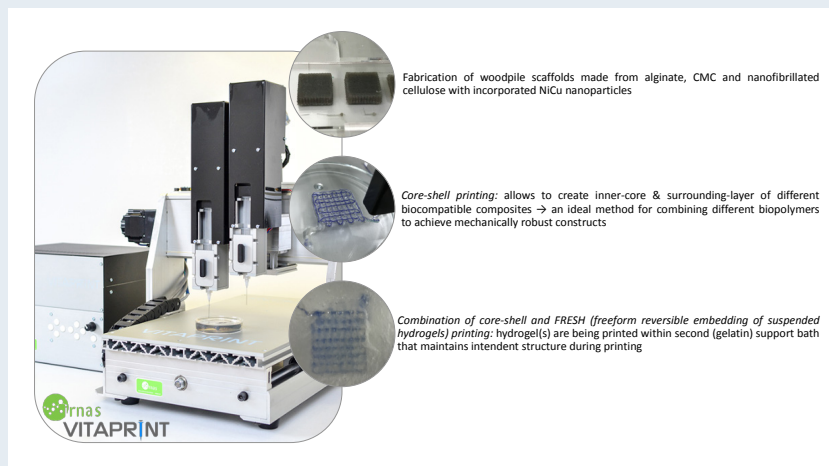


## NEWLY AVAILABLE

### VITAPRINT

## Core-shell and FRESH 3D bioprinting techniques

- Cost-effective solution for custom 3D-bioprinting.
- Fabrication of tissue matrices to emulate the extracellular matrix.
- 3D-printing of biocompatible and structural support as building blocks for intricate biomimetic scaffolds.
- Suitable for aseptic work in a laminar flow hood.
- Controlled extrusion for broad range of usable materials.



#### **Features:**

A large printing volume: 200 x 300 x 50 mm (x, y, z).

Requires only a standard power outlet and USB/Ethernet connection → ideal for work in laminar hood.

An open-source and modular platform → simple integration and exchange of various tools.

Integrated thermal control provides 3D-printing in accordance to the specific melting point of materials up to 80 C.

Direct force translation from motor to piston → a controlled extrusion.

Broad range of usable materials, even highly viscous materials (i.e. paste).

Advanced printing control → provides to use g-code in a broad range of formats.

2 separate extruders allow to combine different materials with different (temperature) properties in one scaffold.

#### **Applications:**

- Tissue engineering
- Biomaterial development
- Biomedicine
- Regenerative medicine

**Authors:** Tanja Zidarič, Marko Milojević, Boštjan Vihar, Tina Maver, Uroš Maver

**Contact:** [uros.maver@um.si](mailto:uros.maver@um.si)



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## Bio-surface modification of polyester-based vascular-graft materials with peptides and glycosaminoglycans for controlled protein adhesion and improved endothelialisation

Post doctoral project

Matej Bračič<sup>1</sup>

<sup>1</sup> Laboratorij za obdelavo in preskušanje polimernih materialov (LOPPM), Fakulteta za strojništvo, Univerza v Mariboru, Smetanova ulica 17, 2000 Maribor, Slovenija.

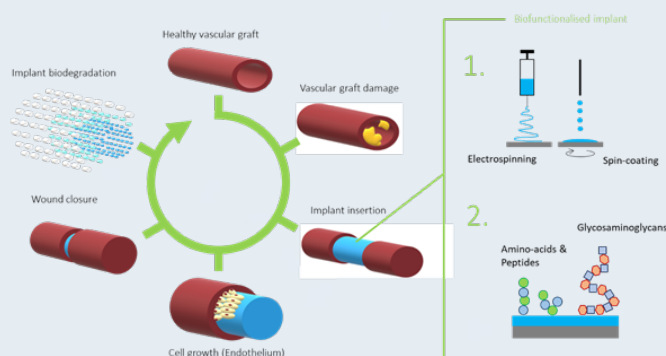


Understanding and controlling the adsorption of blood components like proteins, platelets and cells at vascular interfaces is of crucial importance for the rational design and application of materials to be used in vascular tissue engineering as their unspecific adsorption can prevent endothelialisation, leading to infections associated with vascular implants, which are notoriously difficult to treat and can also lead to serious complications or rejection of the implants.

As reported by the World Health Organisation, cardiovascular diseases are the number one cause of death globally, accounting for more than 17.7 million deaths in 2015, which represents 31 % of all global deaths. Apart from preventive measures, surgical replacement of vascular grafts by autologous or artificial blood vessels based on polyester biomaterials is one of the leading solutions to fight these diseases.

The aim of this work is to modify the surface of nanometric PCL films by naturally derived components like amino-acids, peptides and glycosaminoglycans and systematically, and in great detail study the interactions of this highly bioactive surfaces with proteins, platelets and endothelial cells by state of the art surface analytical techniques, QCM-D, MP-SPR, and atomic force microscopy (AFM). The knowledge gained from this will be transferred to designing a 3D structured and highly bioactive electrospun PCL substrates with tuneable micro- and nano-meter sized pores, fibres and morphology, which will be submitted to protein/platelet properties and endothelial cell growth test in order to determine its potential as a fully biocompatible artificial vascular graft.

This project is fully financed by the Slovenian research agency.







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## Starch Film as a Carrier of a Model Drug Substance from the Group of Non-Steroidal Anti-Inflammatory Drugs

Dariusz Wawro <sup>1</sup>, Andrzej Bodek <sup>1</sup>, Kazimiera Henryka Bodek <sup>2</sup>

<sup>1</sup> Institute of Biopolymers and Chemical Fibres, <sup>2</sup> Medical University of Lodz,

For a long time, polymers have had a great role in pharmacy as they are the auxiliary components of drugs of various forms, mainly tablets. They are more and more widely applied mainly due to their properties and the fact that other useful forms can be produced from them, e.g. nonwoven, sponges and films. Microcrystalline cellulose, starch, chitosan, alginate and other polysaccharides are common components of tablets – fillers, and disintegrating and binding agents. Researchers from the Institute of Biopolymers and Chemical Fibres elaborated a technology of obtaining films from aqueous solutions of polysaccharides, i.e. cellulose, chitosan, sodium alginate, starch and their blends. The results of investigations allowed a selection of films characterised by properties which are suitable for drugs. Non-steroidal anti-inflammatory drugs (NSAIDs), which are carboxylic acid derivatives, constitute the largest group of drugs, and are widely applied in pharmacotherapy. They are analgesic, antipyretic and anti-inflammatory drugs.

The article [1] describes the preparation of starch film as a carrier of a model drug substance from the group of non-steroidal anti-inflammatory drugs (NSAIDs). The following solid drug substances were included in the tests: acetylsalicylic acid, salicylic acid, ibuprofen lysine salt, naproxen in the form of acid, and sodium salt. Forming a film under laboratory conditions involved spreading aqueous starch solution containing a drug on a flat heated surface and evaporating water. The films obtained were transparent. Starch films which contained therapeutic substances were characterised by Fourier transform infrared spectroscopy (FTIR),

Scanning electron microscope (SEM) as well as by determination the release rate of a drug to an acetate buffer pH 4.5 (acetylsalicylic acid and salicylic acid) or phosphate buffer pH 7.38 (ibuprofen lysine salt and naproxen).



a) Photo of starch films containing naproxen sodium (NapNa/2)

b) Photo of starch films containing naproxen (Nap/4)

Acetylsalicylic acid and salicylic acid were almost completely released from the starch film as early as in the first minutes of the procedure, with a maximum value of around 90%. The release of ibuprofen lysine salt and naproxen in the form of acid from the starch film was partial, about 40%. The release of naproxen sodium from the starch film was time-proportional, and there was a tendency towards further release. This is positive with regard to the topical drug-application, which is for giving a prolonged therapeutic effect.

[1] Wawro D, Bodek A, Bodek KH. ; *FIBRES & TEXTILES in Eastern Europe* 2018; 26, 6(132): 102-113.  
DOI: 10.5604/01.3001.0012.5166



## Dimensional characteristics and mechanical properties of natural fibres: towards an efficient and reliable assessment of their cross-sectional area

William GARAT<sup>1</sup>, Stephane CORN<sup>1\*</sup>, Nicolas LE MOIGNE<sup>1\*\*</sup>, Johnny BEAUGRAND<sup>2,b</sup>, Anne BERGERET<sup>1</sup>

<sup>1</sup> Centre des matériaux des Mines d'Alès (C2MA), IMT Mines Alès

<sup>2</sup> Fractionnement des Agro Ressources et Environnement (FARE), INRA, Université de Reims Champagne-Ardenne

<sup>b</sup> Current address: Biopolymères Interactions Assemblages (BIA), INRA, Nantes, France

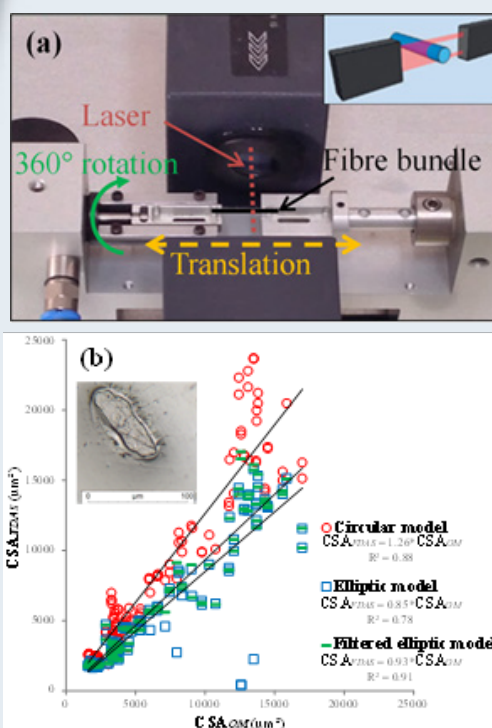


Figure 1. (a) automated laser scanning principle, (b) Correlation between CSAFDAS and CSAOM for circular, elliptic and filtered elliptic models for hemp fibres bundles.

The development of natural fibres in engineering applications requires the reliable and accurate assessment of their dimensional characteristics and mechanical properties. Fibre cross-sectional area (CSA) obtained from lateral dimensional measurements should consider the specific cross-sectional shape of natural fibres and its wide lengthwise morphometric variations. A detailed dimensional analysis was conducted on a selected panel of natural fibres (palm, sisal, flax, hemp, nettle) with contrasted morphometric characteristics belonging to various phylogenetic plant species with dissimilar functions in planta. An automated laser scanning device (FDAS, Diastron Ltd) was used (Figure 1a) and compared to optical microscopy (OM) measurements. Geometrical models and filtering data method were developed for calculation of reliable CSAs adapted to each plant fibre species. Results show that CSAs of palm and sisal fibre bundles can be satisfactorily assessed by a circular model with minimal data processing, whereas hemp, flax and nettle fibre bundles require specific data filtering due to partial splicing, and can be better assessed by an elliptic model (Figure 1b).

The results and methodologies developed in this work are an important step forward for improving the characterization of the dimensional characteristics and mechanical properties of natural fibres. The devices can be placed in controlled environments (humidity, T°C) to consider the effect of water and solvents on the swelling and mechanical behaviour of natural fibres.

### Find more information in:

[1] Garat, W., Corn, S., Le Moigne, N., Beaugrand, J., Bergeret, A. (2018) *Analysis of the morphometric variations in natural fibres by automated laser scanning: Towards an efficient and reliable assessment of the cross-sectional area*. Composites Part A: Applied Science and Manufacturing, 108, pp. 114-123.

<https://doi.org/10.1016/j.compositesa.2018.02.018>

[2] Garat W, Corn S, Le Moigne N, Beaugrand J, Bergeret A. (2018) *Dimensional variations and mechanical behaviour of natural fibres from various plant species in controlled hygro/hydrothermal conditions*. ECCM 2018 - Proceeding of the 18th European Conference on Composite Materials, Athens





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## EPNOE Member's Scientific Publications

### At ARMINES-CEMEF, France:

K. LABIDI, O. KORHONEN, M. ZRIDA, A. H. HAMZAOUI, T. BUDTOVA, "All-cellulose composites from alfa and wood fibers", *Industrial Crops & Products* 127 , 135–141 (2019)

R. H. ABOU-SALEH, M. C. HERNANDEZ-GOMEZ, S. AMSBURY, C. PANIAGUA, M. BOURDON, S. MIYASHIMA, Y. HELARIUTTA, M. FULLER, T. BUDTOVA, S. D. CONNELL, M. E. RIES, Y. BENITEZ-ALFONSO, "Interactions between callose and cellulose revealed through the analysis of biopolymer mixtures", *Nature Communications* 9 , 4538 – 4551 (2018)

K. GANESAN, T. BUDTOVA, L. RATKE, P. GURIKOV, V. BAUDRON, I. PREIBISCH, P. NIEMEYER, I. SMIRNOVA, B. MILOW "Review on the Production of Polysaccharide Aerogel Particles", *Materials*, 11, 2144 - 2181 (2018)

### At IMT - Mines d'Alès - C2MA, France:

Mathiot C, Ponge P, Gallard B, Sassi J-F, Delrue F, Le Moigne N (2019) Microalgae starch-based bioplastics: Screening of ten strains and plasticization of unfractionated microalgae by extrusion, *Carbohydrate Polymers*, 208, 142-151 doi.org/10.1016/j.carbpol.2018.12.057

Hijazi, N., Le Moigne, N., Rodier, E., Sauceau, M., Vincent, T., Benezet, J.-C., Fages, J. (2018) Biocomposite films based on poly(lactic acid) and chitosan nanoparticles: Elaboration, microstructural and thermal characterization. *Polymer Engineering and Science*, 59:E350–E360. doi.org/10.1002/pen.24983

Liotier P.-J., Pucci M.F., Le Duigou A., Kervoelen A., Tirilló J., Sarasini F., Drapier S. (2019) Role of interface formation versus fibres properties in the mechanical behaviour of bio-based composites manufactured by liquid composite molding processes. *Composites Part B*: 163, 86-95. doi.org/10.1016/j.compositesb.2018.10.103

Garat W, Corn S, Le Moigne N, Beaugrand J, Bergeret A. (2018) Dimensional variations and mechanical behaviour of natural fibres from various plant species in controlled hygro/hydrothermal conditions. *ECCM 2018 - Proceeding of the 18th European Conference on Composite Materials*, Athens

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### At INRA-Nantes, France:

Evolution of flax cell wall ultrastructure and mechanical properties during the retting step  
Alain Bourmaud, David Siniscalco, Loïc Foucat, Camille Goudenhooff, Xavier Falourd, Bruno Pontoire, Olivier Arnould, Johnny Beaugrand, Christophe Baley. *Carbohydrate Polymers* 2019, <https://doi.org/10.1016/j.carbpol.2018.10.065>

Ferulic acid derivatives used as biobased powders for a convenient plasticization of polylactic acid in continuous hot-melt process

Samir Kasmi, Antoine Gallos, Johnny Beaugrand, Gabriel Paës, Florent Allais. *European Polymer Journal* 2019, <https://doi.org/10.1016/j.eurpolymj.2018.11.036>

Humidity responsive actuation of bioinspired hygromorph biocomposites (HBC) for adaptive structures

Le Duigou A, Keryvin V, Beaugrand J, Pernes M, Scarpa F, Castro M. *Composites Part A: Applied Science and Manufacturing* 2019, <https://doi.org/10.1016/j.compositesa.2018.10.018>

Mechanical properties of leaf sheath date palm fibre biomass waste reinforced polycaprolactone (PCL) biocomposites

Dhakal H.N, Bourmaud A, Berzin F, Almansour F, Zhang Z, Darshil U. Shah D.U, Beaugrand J. *Industrial Crops and Products* 2018, <https://doi.org/10.1016/j.indcrop.2018.10.044>

### At Petru-Poni Institute, Romania:

Maria Bercea, Gabriela Biliuta, Mihaela Avadanei, Raluca Ioana Baron, Maria Butnaru, **Sergiu Coseri**  
Self-healing hydrogels of oxidized pullulan and poly(vinyl alcohol)  
*Carbohydrate Polymers*, 206, 210-219, **2019**.

Raluca Ioana Baron, Maria Bercea, Mihaela Avadanei, Gabriela Lisa, Gabriela Biliuta, **Sergiu Coseri\***  
Green route to produce self-healable hydrogels based on tricarboxy cellulose and poly (vinyl alcohol)  
*International Journal of Biological Macromolecules*, 123, 744-751, **2019**.

### At Maribor University, Slovenia:

POTTATHARA, Yasir Beeran, THOMAS, Sabu, KALARIKKAL, Nandakumar, GRIEBER, Thomas, GROHENS, Yves, BOBNAR, Vid, FINŠGAR, Matjaž, KOKOL, Vanja, KARGL, Rupert. UV-Induced reduction of graphene oxide in cellulose nanofibril composites. *New journal of chemistry*, ISSN 1144-0546. [Print ed.], 2019, vol. 43, iss. 2, str. 681-688, doi: 10.1039/C8NJ03563F.

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### At Jena University, Germany:

Modular synthesis of non-charged and ionic xylan carbamate derivatives from xylan carbonates L. Gabriel, M. Gericke, Th. Heinze Carbohydrate Polymers (2018) DOI: 10.1016/j.carbpol.2018.12.012

Reactive nanoparticles with activated ester moieties from cellulose acetate phthalate derivatives P. Schulze, M. Gericke, Th. Heinze Cellulose (2018) DOI: 10.1007/s10570-018-2108-5

Aminocelluloses – Polymers with fascinating properties and application potential Th. Heinze, Th. Elschner, K. Ganske in Cellulose Science and Technology – Chemistry, Analysis, and Applications, Th. Rosenau, A. Potthast, J. Hell (Eds.), John Wiley & Sons, 2018, pp. 1-18, ISBN 9781119217589.

Improvement of dyeing performance of cellulose fibers by pre-treatment with amino cellulose Th. Heinze, Th. Wellhöfer, K. Jedvert, A. Koschella, H. Würfel Lenzinger Berichte 94 (2018) 115-122.

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Synthesis of pyridine-free xylan sulfates A. Pfeifer, Th. Heinze Carbohydrate Polymers 206 (2019) 65-69.

### At University of Trieste, Italy:

Nucleation, reorganization and disassembly of an active network from lactose-modified chitosan mimicking biological matrices

Franco Furlani, Pasquale Sacco, Francesca Scognamiglio, Fioretta Asaro, Andrea Travan, Massimiliano Borgogna, Eleonora Marsich, Michela Cok, Sergio Paoletti, Ivan Donati Carbohydrate Polymers 208 (2019) 451–456

31 December 2018 (accepted)

<https://doi.org/10.1016/j.carbpol.2018.12.096>

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B. S. Okhunedae, R. F. Mukhamatkhanova, I. J. Shamyayov, N. Z. Mamadalieva, M. Bacher, S. Böhmendorfer, T. Rosenau, G. Zengin. Flavone glucosides from *Artemisia juncea*. *Nat Prod Res* 2018, 1-7.

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Hosoya, T., Bacher, M., Potthast, A., Elder, T., Rosenau, T., Insights into degradation pathways of oxidized anhydroglucose units in cellulose by  $\beta$ -alkoxy-elimination: a combined theoretical and experimental approach. *Cellulose* 25/7 (2018) 3797-3814.



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## Other news

### **Plant fibres and biopolymers for biobased materials and composites applications**

24-25-26 April 2019, Nantes - Westotel (France)

For more information, [bernard.cathala@inra.fr](mailto:bernard.cathala@inra.fr) or [chloe.joly@univ-ubs.fr](mailto:chloe.joly@univ-ubs.fr)

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### **Postdoctoral position: Supramolecular buildings of nanocelluloses INRA Biopolymères, Interactions et Assemblages, Nantes (France)**

This postdoctoral position corresponds to the fabrication of mono and multi motor-modified cellulose nanocrystals capable of performing nanomolecular work.

In this project we aim to selectively introduce chemical moieties on the surface of cellulose nanocrystals (CNC). As chemical functionalities we will explore (macro)molecules capable of responding to external stimuli that control CNC movement and arrangement. The objective is therefore the fabrication of nanomolecular machines consisting of molecular motors (molecules that develop molecular work under external stimuli) coupled to cellulose nanocrystals (that will act as the "arms" of the nanomachines).

The postdoc will modify cellulose nanocrystals, and he/she will characterize them. Characterization will involve the detection of the motor within the cellulose structure. He/she will also focus on the application of the assemblies nanocellulose-motor, the evaluation of cellulose nanocrystals motion, and the exploitation for the development of applications.

This postdoctoral position (18 months from February-April 2019) will be developed at the Biopolymers Interactions and Assemblies (BIA) unit from the National Institute for Agricultural Research (INRA) located in Nantes (France), more precisely in the Nanostructured Assemblies (Nano) team under the supervision of Ana Villares.

Application procedure: Send a brief CV (maximum 2 pages) and a cover letter to Ana Villares ([ana.villares@inra.fr](mailto:ana.villares@inra.fr)) and Bernard Cathala ([Bernard.cathala@inra.fr](mailto:Bernard.cathala@inra.fr)) including two references for possible recommendation.

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### **Realising the circular bioeconomy**

#### **OECD SCIENCE, TECHNOLOGY AND INDUSTRY POLICY PAPERS**

**November 2018 No. 60**

First the bioeconomy and then circular economy have gained political traction during the second decade of this century. There are synergies to be exploited, but also potential misalignments. The movement of bioeconomy toward the use of wastes, co-products and residue sources resonates well with circular economy principles of making the most efficient use of natural resources, as does the transition in focus from virgin to secondary materials in production. However, poorly aligned waste characterisation as well as biomass competition reflect both theoretical and practical conflicts between industrial and environmental policy. Further, waste markets can be disrupted as some materials that currently go to recycling, landfill or incineration could in the future be bound for biorefineries, with implications for waste management markets and public infrastructure. Policies promoting the cascading use of biomass could help mitigate these tensions by achieving high resource productivity.

[https://www.oecd-ilibrary.org/industry-and-services/realising-the-circular-bioeconomy\\_31bb2345-en](https://www.oecd-ilibrary.org/industry-and-services/realising-the-circular-bioeconomy_31bb2345-en)

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### **IWBLCM 2019**

**2nd International Workshop on Biorefinery of Lignocellulosic Materials - CeIA3**

**4-7 June 2019, Córdoba, Spain**

More information: <https://iwblcm2019.com/>





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## Other news

**12th International Conference on Bio-based Materials, 15–16 May 2019, Maternushaus, Cologne, Germany**

<http://bio-based-conference.com/>  
[dominik.vogt@nova-institut.de](mailto:dominik.vogt@nova-institut.de)

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**Eurofillers PolymerBlends Conference, Palermo April 23-26, 2019**

Information at : <http://modest.org.uk/eurofillers-polymerblends-palermo-italy/>

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**Electrospinning and related techniques. From design to production of advanced polymer materials and devices conference, Como, Italy on 12-16th May, 2019**

The conference will cover the following topics:

Principles of electrospinning and related electro-hydrodynamic techniques (electrospinning...). Effect of high electric fields in the behaviour of polymer and composite formulations. Miscibility and segregation of polymers and composite formulations

Chemical structure, morphology and orientation rules in electrospinning and related techniques.

Random and oriented fibers. Control of process parameters. Application of templates for specific orientation and interactions of fibers and loaded systems

Advanced applications in energy and transport.

Contribution to new approaches in nanomaterials and nanodevices

Developments in the biomedical and pharmaceutical field. New methodologies for the fabrication of drug delivery systems, 3D cell supports and tissue engineering scaffolds.

Design and fabrication of new equipments for advanced applications.

Future prospects of electrospinning and related techniques in the field of polymer and composite materials.

Details can be found on <https://www.aim.it/eupoc2019>

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**International Symposium on Green Chemistry (ISGC 2019) 13-17 May 2019, La Rochelle, France**

ISGC is the largest international scientific event putting together actors involved in sustainable chemistry: researchers from private and academic laboratories, business developers, start-ups founders, investment funds, SATT.

ISGC 2019 scientific program : 240 oral communications and 80 industrial communications

More information: <https://www.isgc-symposium.com/>

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**EUBCE 2019 - 27th European Biomass Conference and Exhibition, 27-30 May 2019, Lisbon, Portugal**

The Conference will be structured along the following main topics:

1. BIOMASS RESOURCES
2. BIOMASS CONVERSION TECHNOLOGIES FOR HEATING, COOLING AND ELECTRICITY
3. BIOMASS CONVERSION TECHNOLOGIES FOR ENERGY CARRIERS, CHEMICALS AND MATERIALS
4. BIOMASS SUSTAINABILITY, IMPACTS AND POLICIES
5. BIOENERGY INTEGRATION IN ENERGY SYSTEMS

More information at <http://www.eubce.com>



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## Other news

**Fourth International Conference on Nanomaterials: Synthesis, Characterization and Applications (ICN 2019) 12-14 April 2019 at Mahatma Gandhi University, Kottayam, Kerala, India**

More information at: <http://www.nanomaterials.macromol.in>

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### **Biobased Coatings Europe 2019, 19th & 20th June, Düsseldorf, Germany**

Demand for bio-based coatings is on the rise. Volumes of bio-based solvents are following a similar upward trajectory. The most important or largest outlet for bio-based solvents is paints, surface coatings and printing inks, with a 40% share. Experts forecast that Europe alone will account for 1 million tonnes by 2020 and will enjoy an annual average growth rate (CAGR) of 8.8% over the period 2015 to 2020

The two day conference will once again bring together senior executives and experts from the coatings industry, policy makers, consultants, technology innovators and leading market analysts to discuss the latest challenges and developments within the industry and engage in excellent networking opportunities.

More information at: <https://www.wplgroup.com/aci/event/biobased-coatings-europe/>

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### **Plant-Based Summit 2019, May 22-24, 2019, Lyon, France**

2019 FOCUS: The Markets of Biobased Solutions

The focus of the 2019 conference is to stimulate biobased products development through a market driven approach. The conference program intends to demonstrate how a higher uptake of biobased solutions in everyday-life products will benefit to consumers and meet their expectations. Your application should therefore highlight the added value and benefits that your products and services bring to the value chain and in particular to the consumers.

More information at: <http://www.plantbasedsummit.com/>

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### **Third International Conference ICBBM2019 Bio-Based Building Materials, June 26th -28th 2019 Belfast, UK**

Biomaterials are processed or engineered products obtained partially or fully from renewable Following up the great success of ICBBM 2017 and ICBBM2015, in 2017 ICBBM2017 International Conference on Bio-Based Building Materials was one of the biggest conferences worldwide in the area on bio-based materials (3BM) used in construction and provided also an excellent platform for networking with more than 260 participants from all over the world and an exhibition. The purpose of this international conference ICBBM2019 is to present the latest available scientific and technical information in the field of bio-based building materials, natural fibres, earthen ramped, innovative hybrid composites natural fibres, sustainable binders for sustainability and energy efficiency of buildings, life cycle analysis of 3BM.

More information at: <https://www.qub.ac.uk/sites/ICBBM2019/>

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### **4th edition of ICNF - International Conference on Natural Fibers – Smart Sustainable Solutions, 1st to 3rd July 2019, Porto, Portugal**

Following up the great success of ICNF2013, ICNF2015 and ICNF2017 covering the topics, "Sustainable materials for advanced applications", "From nature to market" and "Advanced Materials for a Greener World", ICNF2019 will focus on "Smart Sustainable Solutions", aiming to explore the potential of natural fibres as key materials to design smart and sustainable solutions for the future generations. To fulfil this important goal, along with the scientific sessions, Natural Fibrenamics Award contest will be organized to promote and show new innovative natural fibre based products from all over the world.

More information at: <https://www.icnf2019.fibrenamics.com/>





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declared under law of 1901 on December 14th 2007 and published in the French Journal Officiel  
on January 5th 2008 under number 1006, and accept its statutes.*)

L'adhésion est effective pour l'année calendaire en cours dès le paiement de la cotisation annuelle.  
(*Membership is effective for the current calendar year upon payment of the annual membership fee.*)

**Cotisation annuelle** (*Annual membership fee*) 1 000 euros HT (hors taxes) la première année  
(*1 000 euros the first year net fee excluding taxes and duties*) et 700 euros les années suivantes (*700  
euros the following years*)

**Fait à** (lieu), **done in** (*place*): .....

**Date:** .....

**Par** (nom), **By** (*name*): .....

**Titre, Title:** .....

dûment habilité(e) à cet effet (*duly empowered to that effect*).

**Signature:**

**A compléter et envoyer à l'adresse postale suivante, to be filled in and sent to the following  
postal address:**

**Sylvie Massol, CEMEF ARMINES, CS10207  
F-06904 Sophia Antipolis – France**

**Ou par e-mail (or by e-mail to) [contact@epnoe.eu](mailto:contact@epnoe.eu)**

(*Note: any translation in this form is courtesy translation only.*)