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European Polysaccharide Network Of Excellence



"Nature makes polysaccharides, EPNOE turns them into products"

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editorial

Dear Readers of the EPNOE Newsletter,

Polysaccharides are and will be at the central point of the world for the supply of sustainable fuel, food, materials and medical products. They are essential for providing a good standard of living to all organisms including human beings. This should be the asset for developing EPNOE considering the mission statement of EPNOE:

To link academia, research institutes and industry in Europe for developing background knowledge, education, fundamental and applied science in all areas where polysaccharides are involved.

EPNOE must better serve its members and the community.

To this end, five strategic targets were identified, the overall objective being to strongly improve the EPNOE position in each of these five targets.

- Target 1: EPNOE as a scientific society
- Target 2: EPNOE as an actor in the polysaccharide policies
- Target 3: EPNOE as a basic science boosting network
- Target 4: EPNOE as an innovation booster
- Target 5: EPNOE being an actor in polysaccharide education

A survey was conducted in May-July 2018. Sixty EPNOE and non-EPNOE academic and industrial scientists from all over the world expressed their view on the usefulness of EPNOE and on the activities which should be conducted.

The conclusion is that all the activities presently conducted are of interest and only a few are missing. Before the end of the year, an action plan will be implemented, leading to more efficient services to members and more visibility of their activities.

I recall that two EPNOE workshops are organized before the end of the year,

"Polysaccharides as Sweet Spot for Innovation". Leuven (Belgium). 17-18 September 2018.

"Towards flame retardant biopolymers and biocomposites: current research strategies, scientific barriers and application perspectives". Alès (France). 16-17 October 2018.

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 **Jena University, Germany:**

- M. Sc. Maximilian Jacob defended his Master Thesis entitled "Carbon fiber reinforced cast polyamide"

- At **Armines - Mines d'Alès, C2MA, France:**

- Raymond Hajj from Lebanese University, Lebanon and IMT - Mines Alès, France, will defend his PhD thesis entitled " Natural fibers modification processes" in November 29, 2018 at Lebanese University.

New comers:

- At **Jena University, Germany:**

- **M. Sc. Jaka LEVANIČ** from University of Ljubljana joined the group for a short term stay. He is working in the field of nanocellulose hydrogels under the supervison of Martin Gericke and Thomas Heinze.

EPNOE meeting:

- The Cellulose Symposium was held in the frame of annual meeting of the Zellcheming association in Frankfurt/Main June 27-28, 2018. Speakers from Germany, Sweden, Austria, and Finland presented 18 scientific talks.

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How to prepare if the UK leaves the EU with no deal : the case of EU projects

Extracts from an official UK notice published 23 August 2018 by the Department for Exiting the European Union

The full document is available at

https://www.gov.uk/government/collections/how-to-prepare-if-the-uk-leaves-the-eu-with-no-deal#applying-for-eu-funded-programmes

The purpose of this notice is to provide an overview of the scope of the government's guarantee for EU-funded programmes and to link external stakeholders to the parts of government responsible for overseeing the application of the guarantee for specific programmes.

Before 29 March 2019

Until our departure from the EU, we remain a Member State, with all the rights and obligations that entails. This means that the UK will continue to participate in all EU programmes while we remain a member of the EU. As agreed as part of the Financial Settlement, the UK will continue to take part in all EU programmes post 29 March 2019 for the rest of the 2014-2020 Multiannual Financial Framework. This Financial Settlement has been signed off by both UK and Commission negotiators in a draft Withdrawal Agreement and welcomed by the other 27 EU countries at March European Council.

After 29 March 2019 if there's 'no deal'

In this event the UK will leave the EU Budget in March 2019 meaning UK organisations would no longer receive future funding for projects under EU programmes, such as the European Regional Development Fund and Horizon 2020, without further action. However, the Chancellor announced in August and October 2016 that the government will guarantee EU projects agreed before we leave the EU, to provide more certainty for UK organisations over the course of EU Exit. This guarantee ensures that UK organisations, such as charities, businesses and universities, will continue to receive funding over a project's lifetime if they successfully bid into EU-funded programmes before the end of 2020.

The guarantee does not cover funding for organisations from other countries who are in consortia with UK participants – only the funding for UK participants is in scope. We are aware of some cases where UK participants lead a consortium and are responsible for distributing funding to the other participants; the UK government is seeking to discuss how this could best be addressed in a 'no deal' scenario with the European Commission. These discussions would also need to include consideration of projects where the UK's change in status from member state to third country could lead to concerns about ongoing compliance with Horizon 2020 rules (for example, where a consortium no longer meets the threshold for member state and/or associated country participants).

UK researchers and businesses could be able to apply to and participate in all those Horizon 2020 calls open to third country participants from the date of exit, with funding provided via the extended guarantee. Third country participation does not extend to some Horizon 2020 calls; these include European Research Council (ERC) grants, some Marie Sklodowska-Curie Actions (MSCA) and the SME instrument. The government is considering what other measures may be necessary to support UK research and innovation in the event that the guarantee and the extension are required.

This article was proposed by Patrick Navard, ARMINES-CEMEF, France

Open Access and European Commission

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All scientists know that the business of publishing is a rather strange economic model, with countries or companies funding research, paying the salaries of the reviewers and paying to have a copy of research papers. This is a very profitable activity with margins above 30%.

According to the Horizon magazine of the European commission, EU is willing to change this organization and allow all work produced by European states to be open access. Robert-Jan Smits has been recently been appointed as the EU's special envoy on open access, with the target to have all publicly funded research in Europe freely available by 2020. Open access is a top priority within the open science agenda, hoping to place all the billions of euros given to publishers into research. Another objective is also to give easy and low-cost access to scientific publications to the developing countries.

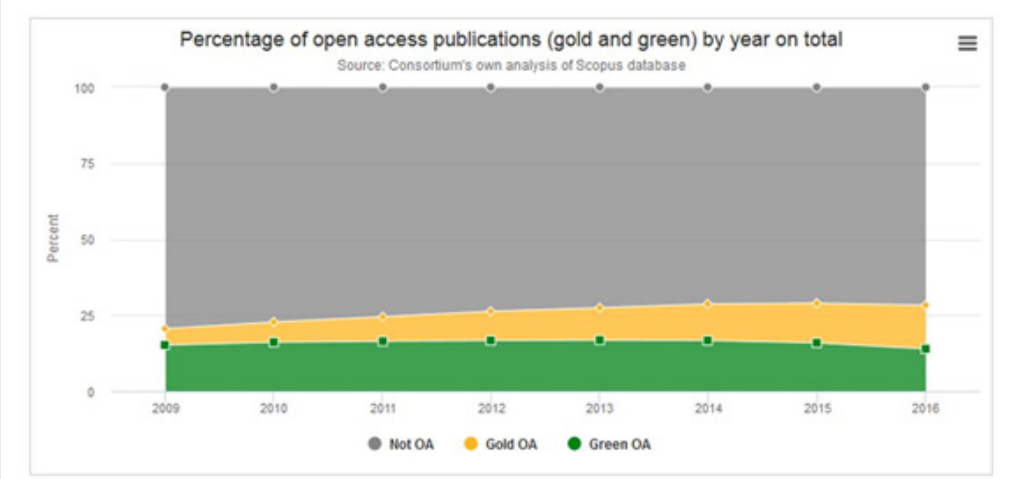

Figure: articles gathered on Scopus. Source https://ec.europa.eu/info/open-science/open-science-monitor/trends-open-access-publications_en. Accessed 10 September 2018

However, this is not such an easy task and the difficulties are numerous, in particular when considering hypocrisies of universities and researchers. All support open access but researchers dream of publishing in the most prestigious journals with the highest impact factor, which are for most of them subscription journals. As well the universities are using the number of publications in high impact journals to rank their researchers.

The last move [Nature 561, 17-18 (2018)] of Robert-Jan Smits is the launch of a plan called Plan S initiative where research European research agencies from UK, France, the Netherlands, Austria, Ireland, Luxembourg, Norway, Poland, Slovenia, Italy and Sweden funding more than 7.6 billion of euros per year) will impose their researchers to publish only in a way which will make publications immediately accessible publicly. Note that some EU countries did not sign, as Germany. Publishers have serious concerns about such plan, as can be imagined.

Such moves towards open access can change the way scientists are evaluated, in particular considering that Plan S would bar researchers from publishing in 85% of journals, including *Nature and Science*.

This article was proposed by Patrick Navard, ARMINES-CEMEF, France



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CELEBRATION OF JAN DLUGOSZ UNIVERSITY DAY

Jan Dlugosz University in Częstochowa (Poland), an EPNOE member, a former Polish 'academy', became a full 'university' in 2018. This was celebrated on 20th June 2018 as the 'University Day', attended by academic teachers and administrative staff, as well as many special guests from outside the university, such as rectors or representatives of partner universities and politicians, including the president of polish Senate. The representatives of the student council and the families of people involved in the event were invited to the celebration, as well. One of our foreign guests was the Coordinator of EPNOE - Dr. Patrick Navard.

The 'University Day' was inaugurated with the Holy Mass celebrated by Archbishop Dr. Wacław Depo, Metropolitan of Częstochowa. After the Mass, the dignitaries, academics, staff, alumni and friends of the University participated in the wreath laying ceremony at Marshal Józef Piłsudski Monument and then marched in the procession to the University Building where further celebrations were held. The event consisted of a few major parts, such as granting academic title of Doctor Honoris Cause to a well-known Polish linguist – Prof. Stanisław Gajda, formal promotion of Doctors and Habilitated Doctors from JDU, or a lecture by Her Magnificence Rector of Jan Dlugosz University – Prof. Anna Wypych-Gawrońska and speeches given by the invited guests, devoted mainly to the change of the official name of our university. The whole ceremony was graced with an instrumental performance of the academics from the Institute of Music of Jan Dlugosz University led by M.Sc. Marek Kudra and choral performance of the academics conducted by Prof. Przemysław Jeziorowski.

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CELEBRATION OF JAN DLUGOSZ UNIVERSITY DAY

(continued)

It would not have happened if it had not been for the endeavor and development of the academic teachers and administrative staff. Jan Dlugosz University is a community proud to have nearly 50 years of history. The year 2018 marked the 48th anniversary of the founding of the University, established first as a Teachers' College then into a Higher Institute of Pedagogy leading in 2004 to the status of the school to Academy for being finally labelled as University in 2018. Jan Dlugosz University currently consists of four faculties, Faculty of Philology and History, Faculty of Mathematics and Natural Sciences, Faculty of Pedagogy, and Faculty of Art, further divided into separate institutes. It has taught students and doctoral candidates in over 40 fields for bachelor, master and doctoral studies including engineering studies, **and biomass-based polymers and products, of course.**

New fields of study and specializations are opened annually. Our staff conduct research and participate in various scientific, scholarship and art exchange programs, improving their professional qualifications. Jan Dlugosz University, as academic center of Częstochowa, is associated with dynamic research, high quality education, and the highest challenges for student enlightenment and plays a major role in encouraging economic and social development for the whole region. The university inspires action and serves the residents of the city, voivodeship, Poland and Europe.

Written by dr hab. Janusz Kapuśniak, Vice-Rector for Research and International Relations

Source: archives of Jan Dlugosz University.



Meeting between EPNOE and Italian Chapter of the Controlled Release Society (CRS)

A first meeting between members of EPNOE and the CRS Italy Chapter took place in the 14th of June in Rome at the Sapienza University. About 20 researchers from 12 universities in Europe participated in this meeting with the objective of promote collaborations in the field of Polysaccharides on Drug Delivery.

The one day agenda included presentations of the different research teams (expertise and interests in this domain) and a round table to discuss different cooperation strategies (exchange of students, co-supervision of thesis, preparation of project proposals, etc.).

Some collective research interests were clearly identified, including the development and production of diverse polysaccharide based(nano)materials for drug delivery by electrospinning and microfluidics, functionalization of polysaccharides, biological evaluation of drug delivery systems and 3D bioprinting technology in general.

This article was proposed by Carmen Freire from Aveiro University, Portugal

New book in the EPNOE*Springerbriefs in Biobased polymers "Surfaces and Interfaces in Natural Fibre Reinforced Composites: Fundamentals, Modifications and Characterization"

N. Le Moigne, B. Otazaghine, S. Corn, H. Angellier-Coussy, A. Bergeret

Centre des matériaux des Mines d'Alès (C2MA), IMT Mines Alès

- **Aimed at students as well as researchers in both academia and industry**
- **Includes key definitions to facilitate learning**
- **Includes a detailed and comprehensive description of the tools and methodologies developed to investigate the interface in natural fibres based composites**

This book is addressed to Master and PhD students as well as researchers from academia andindustry. It aims to provide the key definitions to understand the issues related to interface modifications in natural fibre based composites considering the particular supramolecular and micro- structures encountered in plant fibres. A particular emphasis is given to the modification and functionalization strategies of natural fibres and their impact on biocomposites behaviour and properties. Commonly used and newly developed treatment processes are described in view of scaling-up natural fibre treatments for their implementation in industry. Finally, a detailed and comprehensive description of the tools and methodologies developed to investigate and characterize surfaces and interfaces in natural fibre based composites is reviewed and discussed.

Le Moigne et al. (2018) *Surfaces and Interfaces in Natural Fibre Reinforced Composites*: *Fundamentals, Modifications and Characterization.* Biobased polymers. Springer International Publishing. pp. 136. https://doi.org/10.1007/978-3-319-71410-3

https://www.springer.com/fr/book/9783319714097

This article was proposed by Nicolas Le Moigne and co-authors from IMT Mines d'Alès, France

Origins of hyperswelling of wood in mixed solvents

Julie Bossu[1, 2], Nicolas Le Moigne[2], Stéphane Corn[2], Philippe Trens[1], Francesco Di Renzo[1]

[1] Institut Charles Gerhardt Montpellier – UMR 5253 CNRS, Université de Montpellier-ENSCM

[2] Centre des Matériaux des Mines d'Alès (C2MA), IMT Mines Alès, Université de Montpellier

The relevance of solvents and technical treatments used for wood-based products requires a proper identification of the specific role of each solvent on wood biopolymers to better understand their influence on wood properties. In particular, wood impregnated with aqueous solutions of organic solvents has shown to give rise to a stronger swelling than that observed in pure water. This unexplained phenomenon, described as "hyperswelling", can hardly be elucidated because of the complexity of wood microstructure.

In this work, the effect of the impregnation of aqueous solutions of ethanol of variable concentrations on the physico-mechanical properties of poplar wood has been investigated [1]. The sorption behaviour of veneer sapwood samples has been investigated by vapour sorption gravimetry, dynamic mechanical analysis and optical microscopy monitoring. Pure water and ethanol showed two really contrasting sorption behaviours. Despite comparable amounts sorbed, ethanol leads to a lower swelling and a very limited softening, suggesting different affinities of ethanol and water for wood biopolymers. With mixed solutions, larger swelling and stronger variations in visco-elastic behaviour than in pure solvents were observed, confirming the synergistic effect of water / ethanol mixtures on wood cells physico-mechanical properties. Microscopic observations evidenced that ethanol, both alone and in aqueous solutions, generates intercellular decohesion and disbonding of the wood cell wall layers in the middle lamella region (Fig. 1). These observations are consistent with a mechanism of partial solubilization by ethanol of phenolic compounds such as lignins, leading to a release of constraints between the wood cell wall layers and playing an important role in enabling hyperswelling of cell walls when mixed solvents are absorbed.

These results suggest several orientations for future research programs. The selective interactions of solvent components with different wood biopolymers are worth to be investigated and validated by molecular dynamic simulations. The synergistic swelling mechanism by mixed solvents, implying a loss of stiffness by selective alteration of lignin-rich structures, suggests useful developments of theoretical physico-chemical models of wood swelling. The mechanical study of the transitory states, a factor not to be underestimated in the evaluation of structural materials, represents a largely unexplored field when mixed solvents are concerned. It remains an open question to which extent the size of the specimens and diffusion mechanisms can affect the mechanical behaviour. As a last observation, the understanding of the mechanism of hyperswelling in mixed solvents other than water and ethanol remains terra incognita despite its technological relevance in industrial wood treatments and its service-life.

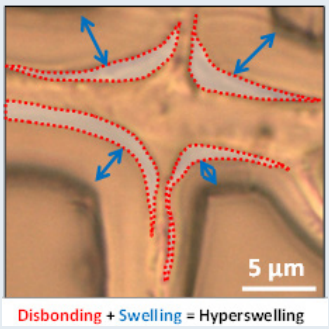

Fig.1. Micrograph of the cell wall microstructure of poplar veneer specimen after immersion and dynamic mechanical testing in water / 44 % ethanol mixture.

Work funded by the Agence Nationale de la Recherche program Investissements d'Avenir in the framework of the contract ANR-10-LABX-05-01 (LabExCheMISyst).

[1] J Bossu, N Le Moigne, S Corn, P Trens, F Di Renzo *Wood Sci Technol* (2018) 52:987–1008
https://doi.org/10.1007/s00226-018-1022-1



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IBWCh Institute of Biopolymers and Chemical Fibres

IBWCh Institute
Research on Polysaccharides

Biopolymers - This direction is specialization of the Institute of Biopolymers and Chemical Fibres (Poland) for many years. This field concern natural polymers such as cellulose, chitin and chitosan, starch, alginates and proteins (keratin, collagen). Works are carried out on the modification of the structure and properties of these polymers using chemical, physicochemical and biochemical methods. Such modified biopolymers are processed into useful products: fibers, nonwovens, films, 3D molds, micro- and nano-structures for further application in medicine, agriculture, textile, paper and packaging industries.

Recently the IBWCh has been conducting research on the conversion of industrial by-products, biomass and wood based raw materials into value-added products. In particular, the works concern the use of different kinds of biomass such as: (i) plant biomass which is a source of cellulose, starch, hemicellulose, lignin; (ii) animal biomass as source of keratin, chitin, chitosan; (iii) microbiological biomass as a source of bacterial cellulose, chitosan. In this area, the Institute carried out a number own research studies as well as within national and EU research projects.

IBWCh is deeply involved in using Plant biomass for the production of biomass- based polymers and actively participated in research projects such as:

• EU project "Wood based materials and fuels", WOBAMA developed within ERA-Net Bioenergy - aim was to converse wood based raw materials to a range of value added bioproducts, both materials and fuels, using different conversion technologies. The project result was a series of demonstrators, i.e. ethanol, composites, cellulose film and others.

• National project " Utilization of biomass for preparation of environment-friendly materials", BIOMASA – focused on developing a range of technologies to produce polymeric fibrous and composite materials based on raw materials deriving from processing of various types of plant biomass by biotechnological methods, utilizing specialized enzyme preparations or cultures of microorganisms. Intermediate products in this processing were: cellulose nanofibres, aliphatic-aromatic copolyesters containing residues of fatty acids and Lactic acid. Obtained cellulose micro- and nanofibres can be used as a filler for the production of innovative thermoplastic composites; on the base of copolyesters functional fibers and nonwovens were produced with potential applications for technical purposes; Lactic acid was the raw material for preparation of polylactide which is potential material for fiber-forming and thermoforming purposes.

IBWCh also has experience with the use Animal biomass which is a source of keratin fibres in the form of waste feathers from the poultry industry. Poultry feathers were applied for the manufacture of new bio-products and composite materials with a wide spectrum of applications, such as:

• Feathers-based absorbent mats for cleaning water reservoirs from crude-oil pollutants. It is characterized by very high capacity to absorb oily substances and selectivity (sorption of fluids immiscible with water).

• Flame retardant plastics modified with keratin fibres. Keratin contained in feathers has a flame-retardant properties. Its use in polymeric materials causes a reduction of their flammability, so it can be a substitute in relation to the currently used anti-pyrenons classified as substances particularly dangerous for human and the environment.

• PP/keratin fibres or PLA/keratin fibres spun bonded nonwoven. Composite nonwovens are hydrophobic, exhibit flame retardant properties and can be used as a filter material, in construction, agriculture or the automotive industry.

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• Presently IBWCh is a Partner of EU Project KaRMA2020 dedicated to "Industrial Feather Waste Valorisation for Sustainable KeRatin-based MAterials". Main Goal of the project is industrial manufacture and exploitation of sustainable raw materials from feather waste to develop innovative green products for high impact cross-sectorial markets such as: fertilizers, food packaging from feather based bioplastics, technical coatings for textiles, thermoset biobased composites.

The second polymer derived from Animal biomass is chitin and chitosan (the main sources are shrimp shells and crabs). An important part of IBWCh development work on biopolymers is research related to the modification, processing and application of chitosan in medicine and veterinary:

• A modern haemostatic dressing and accelerated healing of Tromboguard® wounds have been developed, which is a unique combination of active ingredients (chitosan, alginate, silver) responsible for stop bleeding;, chitosan-modified partial resorbable surgical nets and peripheral nerve prostheses.

• New generation composite dressings based on two-component chitosan/alginate fibres of the core-skin type. These fibres combine the biological properties of both polymers: alginate: they are biocompatible, and also form gels which absorb the fluids secreted by wounds. chitosan: provide antibacterial and haemostatic properties and accelerate the wound healing process.

• Microcrystalline chitosan-based peripheral nerve prosthesis which are neutral, biodegradable and resorbable, and with an internal structure allowing easy rgrowth of the parallel nerve fibres.

• Surgical meshes modified by chitosan - partially-resorbable fascia prosthesis for hernia treatment. Chitosan fibres, other useful chitosan forms (gels, microcrystalline chitosan, fibrids) are employed for the modification of PP surgical meshes.

One of the field of our investigations is Microbiological biomass such as bacterial cellulose, very popular in medical and veterinary devices. Bacterial cellulose is:composed of ultrafine fibers that form an ultrafine network, has a high crystallinity, high polymerization degree and tensile strength, is chemically pure, free of lignin and hemicellulose, it is generated in the form of a never dried membrane and can be modified during synthesis. Wound dressings based on bacterial cellulose modified with chitosan show some advantages when compare with traditional materials, for instance: maintain the optimal moisture conditions for rapid wound healing, provide good isolation of the wound from the environment, show bacteriostatic activity against Staphylococcus aureus and Escherichia coli as well as bactericidal activity against Escherichia coli, are susceptible to degradation by lysozyme (degradation products: mono- and oligo-aminosaccharides are considered bioactive substances), show no cytotoxicity, skin irritation nor allergization and no side-effect changes within the wound.

IBWCh elaborated the following bacterial cellulose-based products:

• Biological hydrogel based on bacterial cellulose modified with chitosan which is perfect dressing in the treatment of burns, bedsores, skin ulcers, hard-to-heal wounds and wounds requiring frequent dressing change.

• Artificial blood vessels obtained due to biosynthesis of modified bacterial cellulose in tubular form, which can be applied in medicine as vascular grafts.

• Surgical PP meshes coated with bacterial cellulose with the addition of chitosan modifier.

This article was proposed by Ewa Wesołowska, IBWCh Institute, Poland

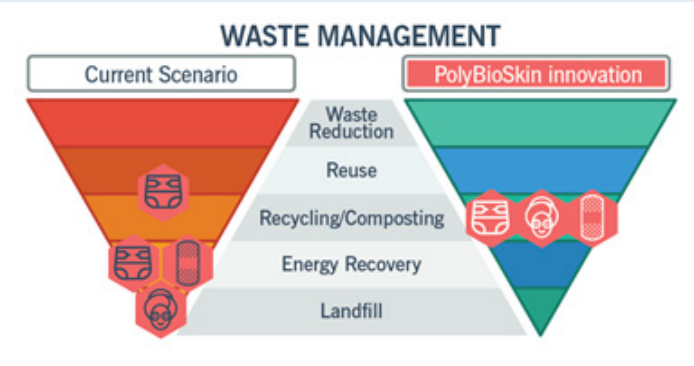
"Nature makes polysaccharides, EPNOE turns them into products"



POLYBIOSKIN: High performance functional bio-based polymers for skin-contact products in biomedical, cosmetic and sanitary industry

Today, most of skin-contact products are still made from fossil-based polymers and are non-recyclable and non-biodegradable. The Union of Concerned Scientists estimates that about 18 billion diapers end up in landfills each year, which poses great environmental concerns. PolyBioSkin aims at leveraging the enormous untapped potential of the use of bio-based polymers in skin-contact product applications by advancing the research and development towards the industrial exploitation of renewable, sustainably-sourced bio-based polymers that offer unprecedented antimicrobial, antioxidant, absorbency, and skin compatibility properties and functionalities for skin protection and sustainability in three strategic target markets: sanitary, cosmetic and biomedical.

Polybioskin will develop and validate: a biodegradable diaper; a biodegradable and bioactive facial beauty mask; a nanostructured biocompatible non-woven tissue. An LCA and LCCA will be performed to demonstrate the products' environmental and economic sustainability and compliance with safety and regulatory requirements will be demonstrated.



This ambitious project started in June 2017 under coordination of IRIS, Spain. POLYBIOSKIN combines the expertise of 12 partners from 7 European countries, including 5 partners from academia and technology institutes, 6 industry participants (SMEs), as well as the European Bioplastics association (EUPB) in a 4 million EUR, 36 month project. ARMINES, France, as a WP3 leader, will be responsible for the synthesis of a >90% bio-based, fully biodegradable and skin compatible super-absorbent polymer (SAP) derived from lignocellulosic materials. More: http://polybioskin.eu/

"PolyBioSkin has received funding from the Bio-based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation program under grant agreement No. 745839"

This article was proposed by Clément Lacoste, IMT - Mines d'Alès, France



EPNOE Member's Scientific Publications

At Jena University, Germany:

Evaluation of the synthesis of soluble aromatic cellulose carbonates of low degree of substitution
K. Ganske, Th. Heinze
Macromolecular Chemistry and Physics (2018) DOI: 10.1002/macp.201800152

Efficient and catalyst-free synthesis of cellulose acetoacetates
H. Würfel, M. Kayser, Th. Heinze
Cellulose (2018) DOI: 10.1007/s10570-018-1908-y

Synthesis of biopolymer□based precursors for the formation of organic–inorganic hybrid materials
Ch. Achtel, S. M Härling, W. Hering, M. Westerhausen, Th. Heinze
Macromolecular Rapid Communications (2018) DOI: 10.1002/marc.201800199

Surprising insensitivity of homogeneous acetylation of cellulose dissolved in triethyl(n-octyl) ammonium chloride/molecular solvent on the solvent polarity
Ch. Achtel, K. Jedvert, M. Kostag, O. A. El Seoud, Th. Heinze
Macromolecular Materials and Engineering 303 (2018) 1800032

At Armines - Mines ParisTech - CEMEF, France:

A. PODSHIVALOV, F. BESSON, T. BUDTOVA, S. BRONNIKOV, "Morphology and improved impact strength of cellulose acetate butyrate blended with 1 polyethylene copolymer", *Express Polymer Letters*, 12 (10), 856–866 (2018)

L. DRUEL, P. NIEMEYER, B. MILOW, T. BUDTOVA, Rheology of cellulose-[DBNH][CO2Et] solutions and shaping into aerogel beads", *Green Chem.*, 20, 3993-4002 (2018), in press, http://dx.doi.org/10.1039/C8GC01189C

AM. RESMERITA, A. COROABA, R. DARIE, F. DOROFTEI, I. SPIRIDON, B. SIMIONESCU et P. NAVARD
"Erosion as a possible mechanism for the decrease of size of plastic pieces floating in oceans", Marine Pollution Bulletin, 127, 387-395 (2018)

Y. FU, G. FODOREAN, P. NAVARD et E. PEUVREL-DISDIER
"Morphology of PLA/PBAT/PA ternary blends: Influence of interfacial measurement accuracy", Polymer International, 2018 DOI 10.1002/pi.5651

M. BERCEA et P. NAVARD
"Viscosity of hydroxypropylcellulose solutions in non-entangled and entangled states", Cellulose Chemistry and Technology, 7-8, 603-608 (2018)

EPNOE Member's Scientific Publications

At IMT Mines d'Alès, France:

J. Bossu, N. Le Moigne, S. Corn, P. Trens, F. Di Renzo (2018) *Sorption of water–ethanol mixtures by poplar wood: swelling and viscoelastic behaviour.* Wood Science &. Technology 52, 987-1008.
https://doi.org/10.1007/s00226-018-1022-1

Lammi, S., Le Moigne, N., Djenane, D., Gontard, N., Angellier-Coussy, H. (2018) *Dry fractionation of olive pomace for the development of food packaging biocomposites.* Industrial Crops and Products, 120, 250-261.
https://doi.org/10.1016/j.indcrop.2018.04.052

N. Le Moigne, M. Sauceau, M. Chauvet, JC Bénézet, J.Fages (2018) *Microcellular Foaming of (Nano)Biocomposites by Continuous Extrusion Assisted by Supercritical CO2.* In: Biomass Extrusion and Reaction Technologies: Principles to Practices and Future Potential. 171-188.
https://doi.org/10.1021/bk-2018-1304.ch009

T. Cadu, M. Berges., O. Sicot, V. Person, B. Piezel, L. Van Schoors, V. Placet, S. Corn, R. Léger, L. Divet, P. Ienny, S. Fontaine (2018) *What are the key parameters to produce a high-grade bio-based composite? Application to flax/epoxy UD laminates produce by thermocompression.* Composites Part B, 150, 36-46.
https://doi.org/10.1016/j.compositesb.2018.04.059

C. Campana, R. Léger, R. Sonnier, L. Ferry, P. Ienny (2018) *Effect of post curing on mechanical properties of a flax fiber reinforced epoxy composite.* Composites Part A, 107, 171-179.
https://doi.org/10.1016/j.compositesa.2017.12.029

J. Bossu, R. Lehnebach, S. Corn, A. Regazzi, J. Beauchêne, B. Clair, *Interlocked grain and density patterns in bagassa guianensis: Changes with ontogeny and mechanical consequences for trees*, Trees - Structure and Function, 2018, https://doi.org/10.1007/s00468-018-1740-x

M.F. Pucci, B. Duchemin, M. Gomina, J. Bréard, T*emperature effect on dynamic wetting of cellulosic substrates by molten polymers for composite processing* – Composites Part A, 2018, https://doi.org/10.1016/j.compositesa.2018.08.031



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EPNOE Member's Scientific Publications

At BOKU, Division of Chemistry of Renewable Resources, Austria:

Most recent articles

Hubbe, M.A., Henniges, U., Potthast, A., Ahn, K., Smith, R.D., Nonaqueous Solution Deacidification Treatments to Prolong the Storage Life of Acidic Books: A Review of Mechanistic and Process Aspects. Bioresources 13/3 (2018) 7096-7136.

Plappert, S.F., Quraishi, S., Pircher, N., Mikkonen, K.S., Veigel, S., Klinger, K.M., Potthast, A., Rosenau, T., Liebner, F.W., Transparent, Flexible, and Strong 2,3-Dialdehyde Cellulose Films with High Oxygen Barrier Properties. Biomacromolecules 19/7 (2018) 2969-2978; DOI: 10.1021/acs.biomac.8b00536.

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Monzote, L., Geroldinger, G., Tonner, M., Bergmann, S., Staniek, K., Gille, L., Monzote, L., Scull, R., De, S. S., Chatterjee, M., Bacher, M., Rosenau, T., Interaction of ascaridole, carvacrol, and caryophyllene oxide from essential oil of Chenopodium ambrosioides L. with mitochondria in Leishmania and other eukaryotes. Phytother Res 32/9 (2018) 1729-1740; DOI: 10.1002/ptr.6097.

Stutzenstein, P., Bacher, M., Rosenau, T., Pfeifer, C., Optimization of Nutrient and Carbon Recov-ery from Anaerobic Digestate via Hydrothermal Carbonization and Investigation of the Influence of the Process Parameters. Waste and Biomass Valorization 9/8 (2018) 1303–1318; DOI: 10.1007/s12649-017-9902-4.



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EPNOE Member's Scientific Publications

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Ahead of Print

Hosoya, T., Zwirchmayr, N.S., Klinger, K.M., Reiter, H., Spitzbart, M., Dietz, T., Eibinger, K., Krei-ner, W., Mahler, A.K., Winter, H., Röder, T., Potthast, A., Elder, T., Rosenau, T., Chromophores in cellulosics, XVIII. Degradation of the cellulosic key chromophore 5,8-dihydroxy-[1,4]-naphthoquinone under conditions of chlorine dioxide pulp bleaching: a combined experimental and theoretical study. Cellulose 2018; DOI: 10.1007/s10570-018-1912-2.

Zinovyev, G., Sulaeva, I., Sumerskii, I., Potthast, A., Podzimek, S., Rossner, D., Kilpelainen, I., Rosenau, T., Getting closer to absolute molar masses of technical lignins. ChemSusChem 2018; DOI: 10.1002/cssc.201801177.

Gao, R., Xiao, S., Gan, W., Liu, Q., Amer, H., Rosenau, T., Li, J., Lu, Y., Mussel adhe-sive-inspired Design of Superhy-drophobic Nanofibrillated Cellulose Aerogels for Oil/Water Separation. ACS Sustainable Chem. Eng. 2018; DOI: 10.1021/acssuschemeng.8b01397.

Hosoya, T., Bacher, M., Potthast, A., Elder, T., Rosenau, T., Insights into degradation pathways of oxidized anhydroglucose units in cellulose by β-alkoxy-elimination: a combined theoretical and experimental approach. Cellulose 2018; DOI: 10.1007/s10570-018-1835-y.

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Beaumont, M., Bacher, M., Potthast, A., Rosenau, T., Opietnik, M., Gindl-Altmutter, W., Rosenau, T., A General Aqueous Silanization Protocol to Introduce Vinyl, Mercapto or Azido Functionalities onto Cellulose Fibers and Nanocelluloses. Molecules 23/6 (2018); DOI: 10.3390/molecules 23061427.

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Other news

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