N°28 - NOVEMBER 2014

European Polysaccharide Network Of Excellence



"Nature makes polysaccharides, EPNOE turns them into products"

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**

editorial

Dear Readers of the EPNOE Newsletter,

The use of polysaccharides and polysaccharide-based or-derived products is progressing in all sectors of activities, rendering even more important the activities of consortia, organisations and networks like EPNOE. To meet the new challenges faced by polysaccharide science and industry, EPNOE Governing Board made the decision to widely open membership. From now, any organization, legal entity or body, whatever its nationality and status, whether private or public, being interested in the overall progress of research in the field of polysaccharide science and any related fields, but not conducting any commercial activities for marketing, producing and selling products based on polysaccharides, can join EPNOE. This new membership status, called Affiliated Members, is particularly suited to universities and research institutions. Detailed information is available in this issue.

Another initiative is to be more active in the building and construction sector. Several EPNOE partners have already activities in this sector and some are building expertise. EPNOE joined the organisation committee of the First Conference on Bio-based Building Materials 2015 to organise a one-day course entitled "Bio-based building materials and use of polysaccharide in building and construction materials" on Sunday June 21, 2015. See details in this issue.

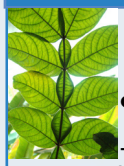
Finally, two major meetings will be organized in January 2015, the EPNOE Junior Scientist International Meeting and the training course: Polysaccharides in health and personal care. They are open to all scientists, members or not of EPNOE (see details in this issue).

Best wishes,

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

news

Member's info



New staff:

- At **ARMINES-CEMEF**, France:

- Nela Buchtova (Post-Doc) research in the frame of "Aerowood" project (Supervisor: Tatiana Budtova on cellulose- and wood-based aerogels);- Dieter de Ridder (KU Leuven) « Thermal stability of biomass tissues", Master degree, Biomass for the Future project;

- Min Wu: "Plant-based concrete", Post-doctoral scientist, Biomass for the Future project.

- At **Jena University**, Germany:

- Sebastian Pflanze, Bachelor thesis, "Synthesis of 6-deoxy-6-amino cellulose with high degree of polymerization" (supervisor: Prof. Th. Heinze);

- Kurt Maier joined the group as businessman to support the Dextrinova project;

- Dr. Holger Wondraczek joined the goup as postdoc working in the field of amphiphilic starch derivatives.

- At **University of Natural Resources and Life Sciences Vienna (BOKU)**, Austria:

- PhD students: Sakeena Quraishi (Anna University, Chennai, India and Hamburg University of Technology), Luca Bertoli (University of Milano-Bicocca and Helsinki University), Enkhjargal Budjav (Mongolian University of Science and Technology), Marco Beaum ont (University of Frei-burg), Grigory Zinovyev (Sankt Petersburg State Forest Technical University, Russia);

- Post-Doc for a two-year project on tunable films (WoodWisdom-Net+): Tiina Nypelö (NC State University, Raleigh, USA and Aalto University, Finland), Associate Editor of the new journal "Hydrogels" (http://www.degruyter.com/view/j/hydro).



EPNOE Member's research

Presenting a national 5 year research network for biopolymers coordinated by Fraunhofer IAP

On August 28 the final meeting of the German research network "Forschungsverbund Biopolymere" was held at the Fraunhofer Institute for Applied Polymer Research IAP at Potsdam-Golm. This 5 year project was funded by the German Ministry of Food and Agriculture via its Agency for Renewable Resources (FNR) with 4.8 million Euros. Coordinated by the Fraunhofer IAP, Research Division Biopolymers, three scientific institutions, i.e. Fraunhofer IAP, Kassel University (Institute for Materials Engineering, IfW), and Technical University Clausthal (Institute for Polymer Materials and Plastics Engineering, PuK) together with 15 industrial partners worked on developing new bio-based materials and products. In close cooperation with the industrial partners, 7 major research lines were followed:

- The use of lignin from domestic black liquor in (bio-based) epoxy systems
- Energy efficient processing of cellulose (regenerated) fiber reinforced bio-based polyamides
- Foam injection molding of starch-polyolefin and starch-poly(lactic acid)(PLA) blends
- Bio-based additives for bioplastics (in particular PLA)
- Polyvinyl acetate-based sizings for cellulose fibers in composites
- Improved thermal stability of cellulose fibers
- Starch-polyolefin blends for blown films and thermoforming
- Lignin-polyolefin blends and composites therefrom with cellulosic reinforcement.

Within the 5 years of project work 20 bachelor, master and diploma theses were written, and results were presented to a broader audience in 20 journal publications and 60 oral presentations. Intellectual property was generated and laid down in 5 patent applications. An overview will be given and selected topics will be presented at the next Biopolymer Colloquium of Fraunhofer IAP in January 2015.

Contact: johannes.ganster@iap.fraunhofer.de

This article was proposed by Fraunhofer Institute for Applied Research, Germany

news (continued)

Member's info

Masters & PhD defenses:

- At **ARMINES-CEMEF, France:**

- Sabri Khalfallah, Master on the microstructure of injected natural-fibre polymer composites (supervisor T. Budtova). The project is part of the Industrial Chair in Bioplastics leaded by CEMEF, Mines ParisTech, Sophia-Antipolis, France.

- At **Jena Univerity, Germany:**

- Philipp Riehl, Master thesis "Antibacterial modification of surfaces by polysaccharide derivatives".

- Melanie Nikolajski, PhD thesis "Multifunctional nanoparticles from 6-deoxy-6-(omega-aminoalkyl)amino celluloses", which has been rated "summa cum laude".

- At **University of Natural Resources and Life Sciences Vienna (BOKU)**, Austria:

- Dr. Bojan Stefanovic "Mechanism for cellulose modification-degradation and surface modification".

Events:

- **University of Maribor**, Slovenia:

- First European conference on SMART INORGANIC POLYMERS in September 2014. Co-hosted by University of Maribor and Graz University of Technology. More info on the website: http://eusip.um.si/

- Workshop "Functional polymer materials" on 6th -10th October 2014, at University of Maribor, Slovenia. For more information follow up our https://www.facebook.com/LCPP.UM

- **Ynsect,** BIC Member, Paris, France:

- Insectinov, 2&3 December 2014, Romainville, France

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**



EPNOE Member's Research

Gefördert durch: Bundesministerium für Wirtschaft und Energie aufgrund eines Beschlusses des Deutschen Bundestages

eXIST Existenzgründungen aus der Wissenschaft

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**

Dextrinova - Starch esters as innovative hot melts

Jana Wotschadlo, Susanne Schmidt, Tim Liebert, Kurt Maier, Thomas Heinze*

Dr. J. Wotschadlo, S. Schmidt, Dr. T. Liebert, K. Maier, Prof. Dr. T. Heinze
Center of Excellence for Polysaccharide Research, Institute of Organic Chemistry and Macromolecular Chemistry, Friedrich Schiller University of Jena, Humboldtstraße 10, 07743 Jena, Germany
Fax: +49 (0) 3641 9 48272; E-mail: Thomas.Heinze@uni-jena.de

Starch is a promising starting material for novel and innovative products. Prof. Heinze and his team at Jena University investigated novel synthesis paths for fatty acid esters of starch and found an efficient procedure to get thermoplastic starch esters with controlled melting behavior. After a period of more than 6 years of basic research, the chemists Dr. Tim Liebert, Dipl.-Chem. Susanne Schmidt, the biotechnologist Dr. Jana Wotschadlo and the businessman Kurt Maier (Figure 1) will bring these starch ester into the marked by founding the startup company "dextrinova". The starch ester should be used as bioadhesives, a hot melt product. The team works on the establishment of "dextrinova" that is supported by the mentor Prof. Dr. Thomas Heinze and the Federal Ministry of Economic Affairs and Energy, which is funding the project as a part of the German EXIST program with almost 500,000 euros.

The main advantage of the new concept of bioadhesives is a customer-specific range of products. According to the application, melting point (38-250°C), viscosity and the holding power of the adhesive may be controlled. The "dextrinova" adhesives are unlike many chemical products best suited due to its biocompatibility and biodegradability to attach hair or eyelashes extensions. In the medical field, it may become possible to stick and fix bone implants, because using this bioadhesive no toxic solvents are needed. In the first phase of the project, the team focuses on industrial, energy-saving low-temperature boning, for example in the packaging industry. It is possible to glue paper and board, metals, wood, ceramics and glass that is possible due to the fact the bioadhesive may be colorless and optical transparent. The team is open for cooperation and looks for partners and customers, who are interested in application of the new bio-super glue and to support the startup "dextrinova".

Figure 1. The founding startup team of "dextrinova": Susanne Schmidt, Dr. Tim Liebert, Kurt Maier and Dr. Jana Wotschadlo. Photo: FSU Jena/Jan-Peter Kasper

This article was proposed by Friedrich Schiller University of Jena, Germany



European Polysaccharide Network Of Excellence

EPNOE Member's research

Biorefinery in practice: a peek in the kitchen

How is biomass actually converted to plastic cups, chemicals or biofuels? We often hear that there are alternatives to petroleum-based products, but how do they work in practice? How is a pile of grass, stems or leaves processed into all kinds of useful products? At Wageningen UR Food & Biobased Research, scientists work on these topics on a day-to-day basis. Two of them give us a peek into the kitchen of the Biobased Economy.

"Often, we get literally a few cubic metres of green stuff, such as sugar beet, roadside grass or tomato stems," says Edwin Keijsers, a specialist in extracting fibres from biomass. "This is sometimes first left to brew and steam outside for a while. However, if you need fresh material, you need to get started quickly or the composition will change and important functional properties will be lost. While the fibres have a longer shelf-life, for an economically viable process you need to fully utilise all the ingredients, including, for example, proteins and sugars."

Paper containers made of tomato leaves

Processing tomato stems into cardboard, for example, and making leaves suitable as raw material for paper containers, requires mechanical, enzymatic and chemical processes. "It's a complex procedure," Keijsers says. "The leaves and stems are separated, shredded and cleaned. Next, the sap is extracted using a belt filter press. This is done not just to remove excess water, but also to extract any ingredients from the biomass that are not required to make paper, yet can still have value for other materials or chemicals. This includes raw materials for plastics or biocides. The process is designed so that tomato leaves are ultimately transformed into a material that can easily be converted into containers in a paper mill using existing machines."

Keijsers and his colleagues have a toolbox full of techniques and knowledge on the used biomass. "The fibres in the tomato stems retain moisture too well," he says. "This makes the machine in the mill runs somewhat slower. Other components, which we still want to remove, cause an unpleasant odour during production. A tailored solution is required for each issue."

Testing refining processes in the technology hall

The equipment in the technology hall of Food & Biobased Research allows Wageningen scientists to search for the most efficient and feasible way to get value from crops and residues. "This allows us to investigate and show what the costs and benefits are," explains Robert Bakker, another scientist at Food & Biobased Research. "Processes that have been developed in the lab are scaled up to a level that makes the process relevant to the industry. This helps companies to decide whether they wish to invest in a given process."

"Biomass residues and byproducts don't always have the same composition, so we are working on processes which can deal with this variety in a flexible way," continues Bakker, who specialises in extracting proteins and sugars from biomass waste streams. "If residues contain a lot of high-quality proteins which can be processed in, e.g., compound feed or human food, we want to get those out first. If there are few or no proteins, then the process focuses primarily on extracting cellulose and lignin."

What Bakker and his colleagues then do with the cellulose depends on its structure. For this purpose, samples of the biomass are first analysed in the lab. Depending on the composition of the lignocellulose, the scientists determine which enzymes are best used to get the most value from the sugars via fermentation – as enzymes can break down sugar chains in controlled conditions in bioreactors.

Temperature, acidity and mixing methods in the conical reactors are adjusted so that the enzymes can do their work optimally. The viscous paste-like mass slowly changes into a liquid. Once the process is completed, it can be clearly seen what impact the enzymes have had – the resulting liquid consists of several layers, and soluble components (such as sugars) are separated from undissolved components (such as lignin).

Micro-orgnisms can subsequently be used to transform the sugars into various chemical compounds. The typeof the micro-organisms added to the liquid depends on the product desired – (poly)lactic acid, ethanol, butanol or hydrogen. This allows products and fuels to be derived from biomass which could, until recently, only be made by refining petroleum.

Wageningen scientists work on a daily basis to make biorefinery processes better, more efficient and cheaper, laying the foundation for a Biobased Economy.

This article was proposed by University of Wageningen, the Netherlands



European Polysaccharide Network Of Excellence

EPNOE Member's research

Increasing fibre crops market advantageous for EU and China

The market for flax and hemp fibres is shrinking so much that the disappearance of just one party in the manufacturing chain could threaten many other parties in this industry. The report 'Markets for fibre crops in EU and China' contains an analysis of the opportunities and threats in the international fibre crop market by researchers from Wageningen UR Food & Biobased Research. Fibre crops are an important source for the textile and other industries and offer a sustainable alternative to synthetic fibres.

Europe and China need each other if the cultivation of fibre crops such as flax and hemp is to remain economically viable, according to European and Chinese researchers, who are collaborating in the project FIBRA. The mechanised cultivation, harvesting and processing of European flax and hemp fibres lead to very high quality fibres. Chinese growers who still produce traditional fibre crops such as hemp, kenaf and ramie, still almost entirely by manual labour, are giving up the cultivation as a result of severe competition. Yet the linen textile industry, which processes most of these fibres, has largely disappeared from Europe, having moved to China where wages are lower. This means that various interdependent links in the manufacturing chain are located too far apart for it to work effectively.

Textile production in low-wage countries

One of the obstacles facing the fibre industry is that wages differ too strongly worldwide, say the researchers. The textile production that relies on fibre processing is now starting to move to countries where labour costs are even lower. "This is worrying," researcher Jan van Dam says, "because the fibre industry is small and the manufacturing chain depends more and more on one-to-one contacts. If a link disappears, a large part of the chain is affected."

Thousands of years of expertise in bio-based fibres

The trend described above immediately exposes another obstacle: the trade in natural fibres is gradually diminishing. For thousands of years, fibre crops have been cultivated, bred, refined and processed to produce clothing, yarns, rope and paper and, these days, car parts as well. This expertise threatens to be lost because bio-based fibres are often being replaced by cheaper but less sustainable synthetic fibres. Another important point is that other crops such as subsidised energy crops are often more profitable for the growers than traditional fibre crops. The present price of petroleum makes it impossible to compete with petrochemical synthetic fibres, but there is a niche market: the consumers who consciously choose sustainable, bio-based products.

Beyond niche market

While high-quality flax and hemp fibres are used in clothing, the lower-quality waste fibres can go to manufacturing, for example, construction and composite materials. However, this is a niche market too – for environmentally aware consumers who prefer to use sustainable materials originating from plants. The price of these materials is higher than that of competing products. "It would be worthwhile identifying niche markets in the short term," Van Dam believes, "but if a sustainable product is to succeed it is important for the sector to rise beyond the niche market status."

Mechanisation in China necessary

The report 'Markets for fibre crops in EU and China' contains several recommendations for expanding the market. Mechanised cultivation and processing of fibre crops in China is important for raising the quality of fibres and for ensuring that prices remain competitive in relation to new low-wage countries. This does not necessarily constitute a threat to European chain parties; on the contrary, it is a chance for them to sell their know-how, skills and machinery in China.

Improve international trade

Another of the researchers' recommendations is to set up international quality labels. These would ensure that companies on the world market could buy precisely the fibres they need – from high-quality fibres for clothing to low quality fibres for use in, for example, insulation materials. "This is essential if the sector is to survive in the 21st century", believes Jan van Dam. Trade can then take place on a larger scale instead of via one-to-one contacts and that will make manufacturing chains less vulnerable if one of the links drops out.

This article was proposed by University of Wageningen, the Netherlands



European Polysaccharide Network Of Excellence

EPNOE Member's research

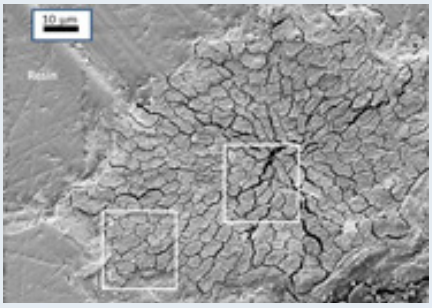
New facilities established in the Materials Forming Center (Centre de Mise en Forme des Matériaux, Cemef), Sophia Antipolis, France

Plant-filled concrete preparation laboratory

In the framework of the Biomass for the Future project (, Cemef established a new laboratory dedicated to the study of plant-filled concrete. It is composed of pieces of equipment allowing preparing different types of concrete (treating biomass, mixing, vibrating, testing, analyzing texture). Concrete filled with lignocellulosic biomass is a very promising material. It is much lighter than classical concrete and has very good thermal and acoustic properties. Due to the use of renewable biomass, its environmental performances are much better than concrete. In a period of time where regulations about the thermal properties of buildings are being increasingly difficult to be met, this class of concrete is of utmost interest. But, several difficulties are hampering its industrial development.

Preparation of lignocellulosic-based concrete is complicated. Water competition between cement and biomass is an issue since water absorbed by biomass is not available for cement hydration while the fact it is present in the mixture is decreasing the overall mechanical properties of concrete. Another factor decreasing the mechanical properties of concrete and increasing hardening time is the fact that chemicals, including sugars, are extracted from biomass, slowing down hardening and building a layer around biomass particles with a lack of setting. The overall mechanical properties of biomass-based concrete are of course much lower than mineral-based concrete and there are some open questions regarding durability.
Cemef is now engaged in this research area with the aim of finding ways to decrease, even suppress, some of the disadvantages and drawbacks suffered during the preparation of plant-filled concrete.

A freshly prepared concrete bloc made with miscanthus stem fragments.



SEM image of a curaua fiber treated with cement and embedded in a resin.

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

European Polysaccharide Network Of Excellence

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**

EPNOE Members News

9th Japanese European Workshop "Cellulose and functional polysaccha-

The 9th Japanese-European Workshop "Cellulose and functional polysaccharides" was organized by the Fraunhofer Institute of Applied Polymer Research IAP Potsdam-Golm at the location of the Fraunhofer Forum in Berlin. This Japanese-European event follows a series of initially Japanese-German workshops starting 1995 in Breisach (Germany) and later Japanese-German-Austrian events (in Sapporo, Vienna, Kyoto, Berlin, Hamburg and Tokyo) which brought together leading experts in the field of cellulose and functional polysaccharides. The recent workshop was supported by the German funding organization for renewable resources FNR (Fachagentur Nachwachsende Rohstoffe e.V.) and the European EPNOE network.

The scientific program was opened with the welcome address of the hosting organizer Prof. Hans-Peter Fink (Head of Fraunhofer IAP) followed by statements of Prof. Akira Isogai (University of Tokyo and president of the Cellulose Society of Japan) and Dr. Patrick Navard (CEMEF-MINES and coordinator of the European Polysaccharide Network of Excellence). About 45 participants with 14 outstanding scientists from Japanese Universities and distinguished European attendees from Austria, Finland, France, Germany, Poland, Slovenia, Sweden and the United Kingdom followed a high level program of scientific presentations in the sections basic polysaccharide science, polysaccharide derivatives, polysaccharide based products and polysaccharide based nano-composites. The program particularly reflects the importance of cellulose and other polysaccharides as renewable resources for the European and Japanese economies. The 24 scientific presentations and 6 posters summarized the progress in cellulose and polysaccharide research since the last workshop in 2012 in Tokyo. The spectrum ranged from high level basic research to attractive product ideas which have been discussed intensely during the workshop. The scientific program ended with an excursion to the Fraunhofer Institute for Applied Polymer Research IAP in Potsdam-Golm as one of the leading German Institutes dealing with polysaccharides and applied biopolymer research. After this visit of Fraunhofer IAP the former president of the Cellulose Society of Japan, Prof. Yoshiyuki Nishio from the Kyoto University thanked Prof. Fink for his long-lasting engagement as one of the pioneers of the Japanese-German and Japanese-European workshops in the field of polysaccharides, and acknowledged as well the local organizers.

The attendees used additional networking possibilities during social events, like the conference dinner on the Berlin TV-tower and a guided bus tour through the city of Berlin (Figure). Altogether, this was a very successful meeting with the next one already scheduled for 2016 in Nice, France.

This article was proposed by Prof. Dieter Hofmann, Fraunhofer Institute for Applied Polymer Research IAP, Germany

European Polysaccharide Network Of Excellence

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**

EPNOE Member's new equipment

University of Maribor

Ink jet printer Fujifilm Dimatix DMP-2831 (see figure 1) is our latest acquisition used for surface treatment of flat substrates and is capable of jetting a wide range of fluids. Variable jetting resolution and pattern creation is PC-controlled. It uses low cost, user-fillable piezo-based ink jet print cartridges.

Figure 1: The ink jet printer Fujifilm Dimatix DMP-2831

Our Zetasizer Nano ZS (see figure 2) is a two angle particle and molecular size analyzer, used for detection of aggregates and measurement of small or dilute samples by dynamic light scattering with non-invasive backscatter optics. It is connected with the titration system MPT-2, providing automatic acid and base additions to the measured system when performing pH dependant size and zeta potential measurements.

Figure 2: The Zetasizer Nano ZS and MPT-2 titrator

Owing the SPR Navi 200 (see figure 3), as a new generation surface plasmon resonance spectrometer, we are able to determine the interaction capacity of biomolecules with surfaces in a wide angular scan range (¬= 40–78°) that produces a complete SPR curve with absolute angle information.

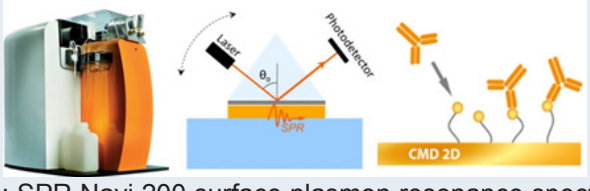


Figure 3: SPR Navi 200 surface plasmon resonance spectrometer



European Polysaccharide Network Of Excellence

In case you need more information, visit our web site **www.epnoe.eu** or send an email to **contact@epnoe.eu**

Subscribe to the EPNOE Newsletter on **www.epnoe.eu**

Affiliated Members

A new type of membership to EPNOE, open to academic institutions

EPNOE (European Polysaccharide Network of Excellence) is a research, education and knowledge transfer network connecting research and education centres, universities and companies. It was founded in 2005.

Up to now, EPNOE was constituted by the 16 founding members (all research and academic institutions) and companies.

EPNOE members decided in 2014 that EPNOE can be enlarged, with new members joining, called Affiliated Members.

The 16 founding EPNOE members established in 2005 a registered non-profit organisation called "EPNOE Association". Members are only legal bodies. May become Member of EPNOE Association only those entities and organisations adhering to the Statute and the Association Rules.
EPNOE Association has three categories of members:

- **Regular Member** are scientific and research organisations whether public or private entity or body, whatever its nationality and status, pursuing research in the field of polysaccharide science and any related field. It is presently limited to the 16 founding members.

- **Business and Industry Club Members** are companies whatever its nationality and status, whether private or public, being interested in the production of products based on polysaccharides.

- **Affiliated Members** are organisations, legal entity or body, whatever its nationality and status, whether private or public, being interested in the overall progress of research in the field of polysaccharide science and any related fields, but not conducting any commercial activities for marketing, producing and selling products based on polysaccharides..

Role and benefits of Affiliated Membership

Affiliated Members are fully embedded into EPNOE activities, without any restriction.
They will have their page on the private web site where they will be able to post their activities, staff expertise, on-going and former PhD work.
They can join all meetings and participate to research and education projects.

It is recalled that this class of membership is primarily open to research and education organisations, with the exclusion of companies which must register under the Business and Industry Club membership status.

Membership conditions and fees

Members are only legal bodies. Fees for Regular members are 500€ per year. Fees for Business and Industry Club Members depends on the number of employees (from 1000€ to 6 000€ per year);

Fees for Affiliated Members are 1000€ the first year, then 500€ per year for the following years. The higher fees for the first year are seen as participation to the huge work made by regular members these last 10 years, which is immediately benefiting to new Affiliated Members.



EPNOE Courses

One-day course on **"Bio-based building materials and use of polysaccharide in building and construction materials"**

EPNOE and the organizing committee of First Conference on Bio-based Building Materials 2015 that will take place in France on 21-24th June 2015 joined their effort to organize a one-day course. The Conference website is: https://sites.google.com/site/ICBBM2015/.

Prior to the conference, a one-day course on "Bio-based building materials and use of polysaccharide in building and construction materials" will be held on Sunday June 21, 2015.
This course has been designed for academic, industrial, and government scientists and PhD students dealing with bio-based building materials and polysaccharide products. It will offer a basis overview of polysaccharides as well as in-depth presentations of several critical aspects of the use of these materials in the building sector.
The program can be found on the conference web site. This course will take place at the same venue as the conference.

On the side of EPNOE, the course is coordinated by Jan van Dam (Wageningen University and Research, the Netherlands) and Patrick Navard (Cemef, Mines ParisTech-CNRS, Sophia Antipolis, France).

Two important meetings opened to all scientists organized by EPNOE in January 2015 in Wageningen, the Netherlands

EPNOE Junior Scientist International Meeting

Monday 19 January 2015 and Tuesday 20 January 2015

The scope of this meeting is to offer a tribune for senior post-doctoral scientists and junior academic or industrial scientists belonging to EPNOE members in order to present their views on the future development of polysaccharide science in all areas. More details will follow in the next weeks and will be posted on the EPNOE site (www.epnoe.eu).

Training course: Polysaccharides in health and personal care

Organisers: Karin Stana-Kleinschek (U. Maribor), Carmen Boeriu and Jan van Dam (Wageningen University and Research), Zdenka Persin (U. Maribor), Ewa Wesolowska (IBWCh Lodz)
Wednesday 21 January 201 and Thursday 22 January 2015

This course, focused on using polysaccharides in health and personal care sectors will be composed of an overview of PS used in health application and their basic properties, on new analytical techniques, on design of PS materials, on polysaccharide scaffolds, wound dressings, release of bioactives and food polysaccharides and health.
More details will follow in the next weeks and will be posted on the EPNOE site (www.epnoe.eu).



Member's Scientific Publications

Maribor University, Slovenia

"The study of plasma's modification effects in viscose used as an absorbent for wound-relevant fluids; Carbohydr Polym; 2013 Aug 14;97(1):143-51" that is ranked on top 20 articles since 2013 in the domain of BioMedLib search.
The article can be found at: http://www.sciencedirect.com/science/article/pii/S0144861713003986

ARMINES-CEMEF, France

C.RUDAZ, R. COURSON, L. BONNET, S. CALAS-ETIENNE, H. SALLEE, T. BUDTOVA
"Aeropectin: fully biomass-based mechanically strong and thermal super-insulating aerogel", Biomacromolecules, 15, 2188−2195 (2014)

A. DEMILECAMPS, G.REICHENAUER, A.RIGACCI, T.BUDTOVA
"Cellulose-silica composite aerogels from "one-pot" synthesis", Cellulose, 2, 2625–2636 (2014)

C.H. HAIGLER, M.J. GRIMSON, J. GERVAIS, N. LE MOIGNE, H. HOFTE, B. MONASSE, P. NAVARD, "Molecular modeling and imaging of initial stages of cellulose fibril assembly: evidence for a disordered intermediate stage", PlusOne, 9(4) e93981 (2014)

J. OBRADOVIC, H. WONDRACZEC, P. FARDIM, L. LASSILA, P. NAVARD, "Preparation of three-dimensional cellulose objects previously swollen in DMAc/LiCl solvent system", Cellulose, 10.1007/s10570-014-0403-3

IBWCh Institute of Biopolymers and Chemical fibres, Poland

"Feathers as a Flame-Retardant in Elastic Polyurethane Foam".Wrześniewska-Tosik K, Zajchowski S, Bryśkiewicz A, Ryszkowska J., FIBRES & TEXTILES in Eastern Europe 2014; 22, 1(103): 119-128

"Galactoglucomannans (GGMs) Extracted from Spruce Sawdust for Medical Applications", Kopania E, Wiśniewska-Wrona M, Wietecha J., FIBRES & TEXTILES in Eastern Europe 2014, Vol. 22, No. 2(104): 29-34

"Strong Cellulosic Film Cast from Ionic Liquid Solutions"., Wawro D, Hummel M, Michud A, Sixta H., FIBRES & TEXTILES in Eastern Europe 2014; 22, 3(105): 35-42

University of Natural Resources and Life Sciences Vienna (BOKU), Austria

Stefanovic, B., Pirker, K., Rosenau, T., Potthast, A., Effects of tribochemical treatments on the integrity of cellulose. Carbohydrate Polymers 111 (2014) 688-699

Pircher, N., Veigel, S., Aigner, N., Nedelec, J.-M., Rosenau, T., Liebner, F., Reinforcement of bacterial cellulose aerogels with biocompatible polymers. Carbohydrate Polymers 111 (2014) 505-513

Henniges, U., Veigel, S., Lems, E.M., Bauer, A., Keckes, J., Pinkl, S., Gindl-Altmutter, W., Microfibrillated cellulose and cellulose nanopaper from Miscanthus biogas production residue. Cellulose 21 (2014) 1601-1610

Hell, J., Kneifel, W., Rosenau, T., Böhmdorfer, S., Analytical techniques for the elucidation of wheat bran constituents and their structural features with emphasis on dietary fiber - A re-view. Trends in Food Science & Technology 35/2 (2014) 102-113



European Polysaccharide Network Of Excellence

Member's Scientific Publications (continued)

University of Natural Resources and Life Sciences Vienna (BOKU), Austria

S., Kneifel, W., Wheat bran-based biorefinery 2: Valorization of products. LWT – Food Science and Technology 56/2 (2014) 222-231

Lackinger, E., Bacher, M., Sartori, J., Zweckmair, T., Potthast, A., Rosenau, T., Synthesis and Characterization of C-13-labeled Alkenyl Succinic Anhydride (ASA) with Defined Double Bond Location. Current Organic Chemistry 18/9 (2014) 1208-1217

Stefanovic, B., Kostic, M., Bacher, M., Rosenau, T., Potthast, A., Vegetable oils in textile finishing applications: the action mode of wrinkle-reduction sprays and means for analyzing their performance. Textile Research Journal 84/5 (2014) 449-460

ECOLE DES MINES D'ALES, France

DOREZ G., FERRY L., SONNIER R., TAGUET A., LOPEZ-CUESTA J-M.
Effect of cellulose, hemicellulose and lignin on pyrolysis and combustion of natural fibers. Journal of Analytical and Applied Pyrolysis, Volume 107, May 2014, Pages 323–331

DOREZ G., OTAZAGHINE B., TAGUET A., FERRY L., LOPEZ-CUESTA J-M.
Improvement of the fire behavior of PBS/flax biocomposites by fiber surface modification with phosphorous compounds: molecular versus macromolecular strategy. Polymer International, Volume 63, Issue 9, Pages 1537–1740

HAIGLER C.H., GRIMSON M. J., GERVAIS J., LE MOIGNE N., HOFTE H., MONASSE B., NAVARD P.
Molecular Modeling and Imaging of Initial Stages of Cellulose Microfibril Assembly: Evidence for a Disordered Intermediate Stage. PLOS ONE, April 2014, volume 9, issue 4, e93981 (open access)

DOREZ G., TAGUET A., FERRY L., LOPEZ-CUESTA J-M.
Phosphorous compounds as flame retardants for Polybutylene Succinate/Flax biocomposite: additive versus reactive route. Polymer Degradation and Stability, Volume 102,Pages 152–159 (April 2014)

ZEMBOUAI I., BRUZAUD S., KACI M., BENHAMIDA A., CORRE YM., GROHENS Y., TAGUET A., LOPEZ-CUESTA JM.
Poly(3-Hydroxybutyrate-co-3-Hydroxyvalerate)/Polylactide Blends: Thermal stability, Flammability and Thermo-mechanical Bahaviour.Journal of Polymers and the Environment, March 2014, Volume 22, Issue 1, pp 131-139

KOUTSOMITOPOULOU A,. BENEZET JC., BERGERET A., PAPANICOLAOU GC.
Preparation and Characterization of Olive Pits Powder as a Filler to Biocomposite. Powder Technology, Volume 255, pp 10-16 (mars 2014)

TRAN TPT., BENEZET J.C., BERGERET A.
Rice and Einkorn wheat husks reinforced poly(lactic acid) (PLA) biocomposites: Effects of alkaline and silane surface treatments of husks. Industrial Crops and Products, 58, 111-124, July 2014



European Polysaccharide Network Of Excellence

Member's Scientific Publications (continued)

ECOLE DES MINES D'ALES, France

LE MOIGNE N., LONGEREY M., TAULEMESSE J.M., BENEZET JC., BERGERET A. Study of the interface in natural fibres reinforced PLA biocomposites modified by optimized organosilane treatments. Industrial Crops and Products 52 (January 2014) 481– 494

DOREZ G., OTAZAGHINE B., TAGUET A., FERRY L., LOPEZ-CUESTA JM. Use of Py-GC/MS and PCFC to characterize te surface modification of flax fibers. Journal of Analytical and Applied Pyrolysis 105 (2014) 122–130

CHABANNES M. ; BENEZET J-C. ; CLERC L. ; GARCIA-DIAZ E. Use of raw rice husk as natural aggregate in a lightweight insulating concrete: An innovative application. Construction and Building Materials 70 (2014) 428–438

HIJAZI N., RODIER E., LETOURNEAU JJ., LOUATI H., SAUCEAU M., LEMOIGNE N., BENEZET JC., FAGES J.
Chitosan nanoparticles generation using CO2 assisted processes. Journal of Supercritical Fluids