2016 report of the Bio-based Colloids and Materials group, BiCMat

Department of Bioproducts and Biosystems

School of Chemical Engineering

Aalto University

2016 Summary
(click on tags to navigate)

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BiCMat

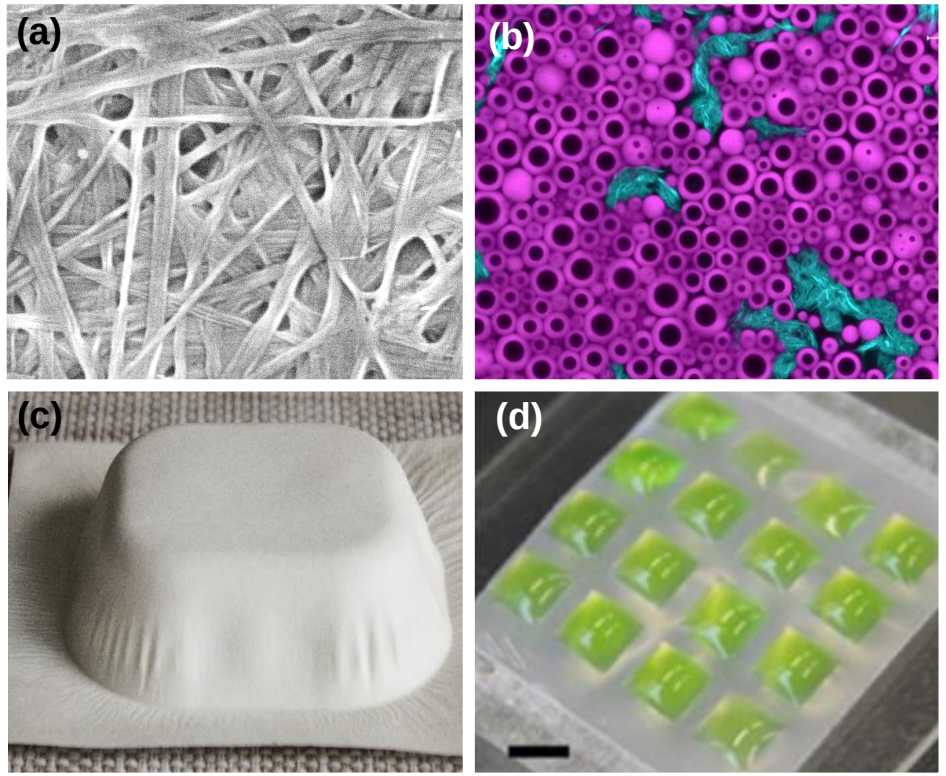
Bio-based Colloids & Materials

Research Strategy

Our core activities involve biobased materials at different size scales, mainly those displaying large interfacial areas such as fibers (micro/nano fibers), fiber networks, particles, colloids and multiphase systems.

Focus areas

- Nano/microfibrillar ligno-cellulose, nanocrystals & bacterial cellulose.
- Multiphase systems: dispersions, foams, gels, membranes and aerogels.
- Stimuli-responsive materials.
- Proteins, enzymes and (bio)sensing.

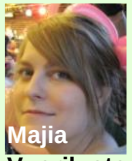


(a) Bacterial cellulose for bio-separations;
(b) double emulsions with CNF;
(c) protein application for super-stretchable paper in thermoforming;
(d) super-hydrophobic patterning of CNF films via photo-click modification.

Orlando Rojas, PhD

Separation

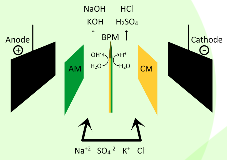
2016-2017

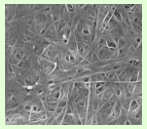


Majia Vuoriluoto

Janika Lehtonen

Alvaro Gonzalez

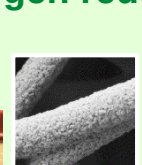




Electro-dialysis in water purification

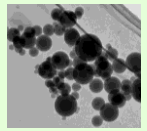
Advanced Lignocellulosics

Electrocatalytic activity: oxygen reduction, fuel cells



Maryam Borghei, PhD

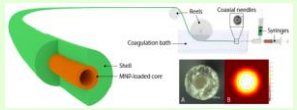
Mariko Ago, PhD



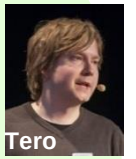
Lignin particles and fibers. Photo-active materials

Lauri Matikainen

Functional filament assemblies



Hydrogels & active materials



Tero Kämäräinen

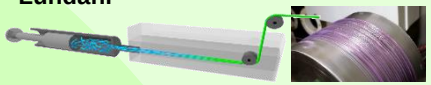
Meri Lundahl

Ling Wang

Nikorn Laocharoen

Karolina Helanto

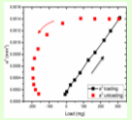
Blaise Tardy, PhD



Upcyling

Wet- and hydrogel spinnig

Alexey Khalalo



Parham Tayeb

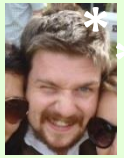
Bacterial cellulose, chitin & bioactive systems

Proteins & interfacial adhesion/composites

Proteins and fat colloids/ bioactive systems

Annamari Jukkola

Egbe Ene

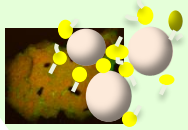


Ben Jeuck

Guillermo Reyes Torres, PhD

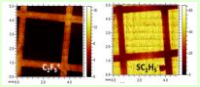
Luiz Greca

Jiaqi Guo



Outi Toikkanen, PhD

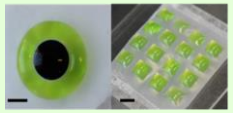
Protein and fat colloids



Wenyi Xie

Organic-inorganic hybrids

Ahsan Uddin



Particle nucleation and sensing

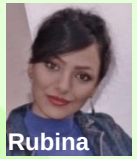
XPS

Surface chemistry

Surface modification

Ilari Filpponen,PhD

Aerogels, Foams and Emulsions



Rubina Ajdary

Wenchao Xiang

Shuai Li, PhD

Shingo Yokota, PhD

Carlos Salas, PhD

Foam forming

Miika Nikinmaa

Annika Ketola

Siqi Huan

Anurodh Tripathi

Lignocellulose-stabilized emulsions and aerogels

Oriol Cusola

Support staff:

Leena-Sisko Johansson, PhD

Marja Kärkkäinen

Ritva Kivelä

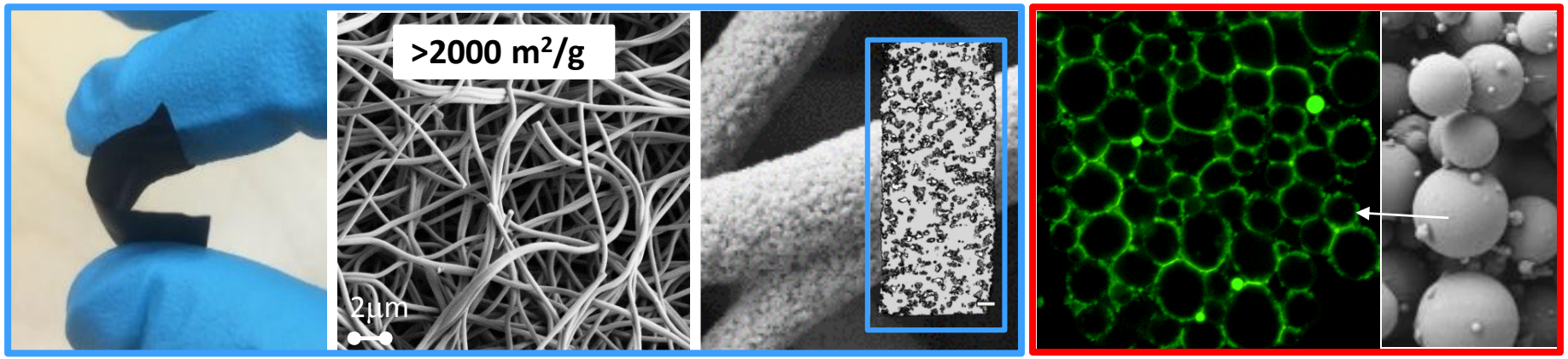
Fulbright scholar: Prof. Ravi Subramanian (Univ. Nevada): **solar cells**

Not shown:
Prajesh Adhikar (*)
Vilja Kauntola
Isabel Carrillo
Emily Facchine (*)

BiCMat members in the US: *

2016 highlight

Biobased Colloids and Materials (BiCMat) group

Topic	Lignins nanofibers and (micro/nano)particles
What?	Novel approaches were developed for integration of lignin in advanced materials
How?	Solution spinning and atomization in an aerosol flow reactor. Activation was carried out by carbonization and heteroatom doping. 
Possible application	Emulsions, foams, flexible electrodes, coatings, carbon fibers, supercapacitors and catalytic systems for oxygen reduction

Aalto University
School of Chemical Technology

BiCMat members added in 2016

1. Luiz Garcia Greca (Ph.D.)
2. Karoliina Helanto (Ph.D.)
3. Annika Ketola (Ph.D.)
4. Rubina Ajdary (M.S.)
5. Lauri Matikainen (M.S.)
6. Vilja Kauntola (M.S.), completed
7. Nikorn Laocharoen (M.S.), completed
8. Blasie Tardy (Postdoc)

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BiCMat members who departed 2016

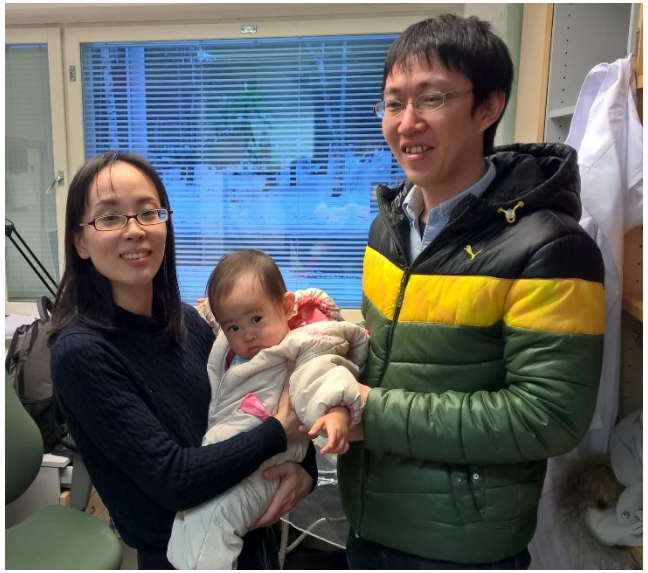
1. Siqi Huan, September 2016 (Northeast Forestry University, Harbin)
2. Ilari Filpponen, expected November 2016 (Auburn University, USA)

BiCMat members who graduated (PhD)

1. Shuai Li (BiCMat-US)
2. Xiaomin Lu (BiCMat-US)
3. Parham Tayeb (BiCMat-US)

Visiting Scholars Hosted by the Group in 2016

1. Vaidyanathan (Ravi) Subramanian, Fulbright Scholar and Asociate Professor, Chemical and Materials Engineering, University of Nevada, Reno, USA
2. Shingo Yokota, Associate Professor, Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Japan
3. Graduate Student Javier Abraham Hernández Díaz, Universidad de Guadalajara, Mexico
4. Graduate Student , Isabel Carrillo, Universidad de Concepcion, Chile

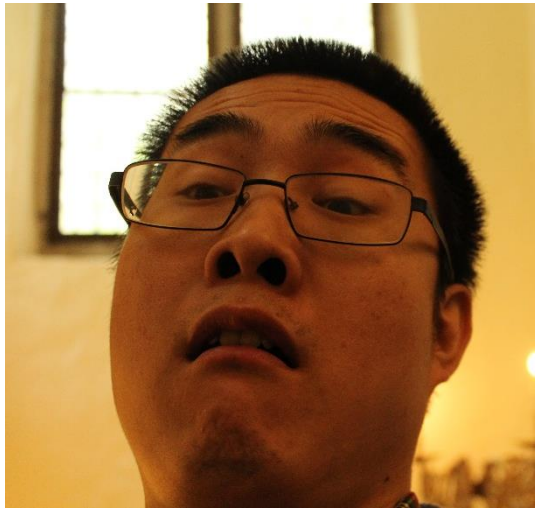


International Seminars organized or hosted

1. Cosima Stubenrauch, Institut für Physikalische Chemie, Universität Stuttgart, Germany: From Surfactants to Foams, Jan 21, 2016
2. Richard Spontak, Materials Science & Engineering, NC State University, Morphological Studies and Versatile Properties of Network-Forming Multiblock Ionomers,February 05, 2016
3. Michael Dickey, Microsoft, Seattle and Chemical and Biomolecular Engineering, North Carolina State University, Liquid metals as soft and shape reconfigurable conductors in micro-scale systems, May 13, 2016.
4. Vaidyanathan (Ravi) Subramanian, University of Nevada, Reno, Solar Energy, Sept. 12, 2016
5. Tetsuo Kondo, Biomaterial Design Lab, Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Bio-alchemy Using Water and Biological Systems, Aug 12, 2016
6. Jan Genzer, Chemical and Biomolecular Engineering, NC State University, US, Spontaneous vs. on-demand degrafting of polymer brushes and organosilane monolayers from silica surfaces, Oct 11, 2016
7. Jan Genzer, Chemical and Biomolecular Engineering, NC State University, US, Polymer sheets that self-fold in response to light, Oct 12, 2016

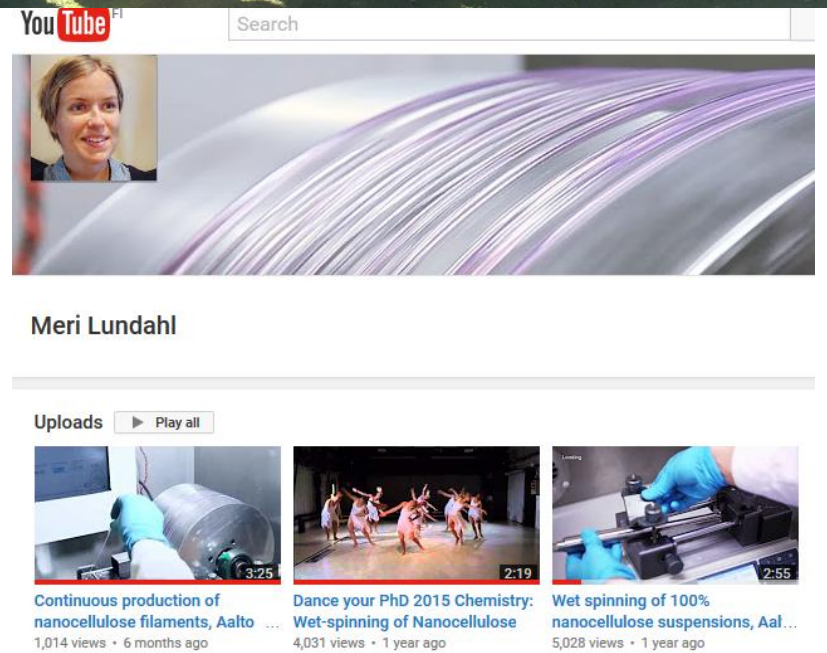
Awards and personnel highlights 2016

1. Alexey Khakalo: Fellowship and selected to present in the 5th EFPRO-CEPI Early Stage Researchers Session to be held during European Paper Week (EPW 2016) in Brussels.
2. Luiz Greca: CHEM Fellowship Aalto Doctoral Program in Chemical Technology, Aalto University (based on competitive projects)
3. Jiaqi Guo: Selected to participate and present in the Wallenberg Prize workshop, Stockholm, Sweden.
4. Jiaqi Guo: Awarded Mobility Fellowship (Aalto and FIN Paper Association) to Institute of Functional Interfaces, Karlsruhe Institute of Technology and Karlsruhe Nano Micro Facility, Karlsruhe, Germany
5. Jiaqi Guo: Awarded funds for academic trip to China (Shandong Government)
6. Meri's review article chosen as "Editor's Choice" in ACS Ind. Eng. Chem. Res



Awards and personnel highlights 2016 (Cont'd)

7. Anurodh Tripathi (BiCMat-USA): Won the 2016 Triangle Student Research competition, First place in Category of "Methods for Making New Materials", The Annual Triangle Student Research Competition was hosted by the Triangle chapters of the Materials Research Society and Electrochemical Society (MRS and ECS).
8. Anurodh Tripathi (BiCMat-USA): $10,000 Research Award from Eastman Chemical Company
9. Meri Lundahl: Selected to participate and present in the Wallenberg Prize workshop, Stockholm, Sweden.
10. Meri Lundahl: Awarded the prestigious Jenny and Antti Wihuri Fellowship.
11. Meri Lundahl: YouTube Channel with her videos reach >10000 views
12. Rubina donated her hair to Childrens with Cancer
13. Wenchao, Janika and Rubina: HYBER prize as part of teams with best one-page proposals. Prize consists of one-year free pass to all museums in Finland.
14. Maija won best PhD paper recognition in the department

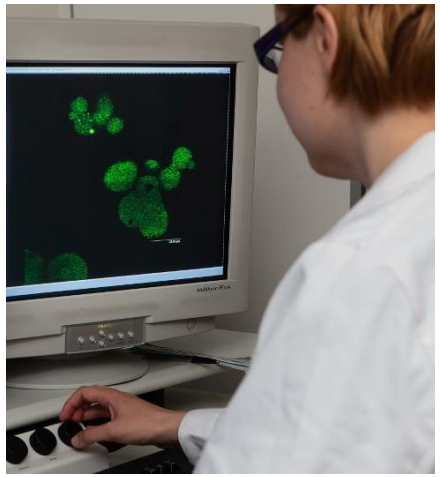


Awards and personnel highlights 2016 (Cont'd)

- Meri awarded as best presentation in the Annual Department Seminar
- Maija awarded best 2016 PhD student paper of the department
- OR: Selected chair of the Aalto's University Materials Platform
- OR: Fibrenamics Award (University of Minho, Portugal, 2016) in recognition for his scientific work and impact in the field of advanced materials from lignocellulose.
- OR: FINCeal travel award (Uruguay and Argentina)

Projects awarded:

- Academy of Finland awarded us a project on 3D-manufacturing of novel biomaterials (Biofuture 2025, with Jukka Seppälä and Jouni Partanen)
- Academy of Finland awarded Foam Forming Project SIRAF (Ilari/Orlando)
- Valio company renew appointments of Annamari Jukkola and Outi Toikkanen
- UPM funded project on superabsorbent fibers
- TEKEs and company consortium funded project on foam forming



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Conference organized in 2016

1. Annual seminar Department of Forest Products Technology Covering the 1010 Scales of Wood, Espoo, Finland, May 27, 2016
2. Nanocellulose Structure and Interactions, Session Chair, 2016 International Conference on Nanotechnology for Renewable Materials, Grenoble, June 13-16, 2016
3. Rheology in Nanocellulose Characterization, Session Chair, 2016 International Conference on Nanotechnology for Renewable Materials, Grenoble, June 13-16, 2016
4. Multiphase Systems and Surface Interaction, Organizer, 2016 International Conference on Nanotechnology for Renewable Materials, Grenoble, June 13-16, 2016
5. CIADICYP 2016, the Iberoamerican Congress on Pulp and Paper Research, Sept 5-9, 2016, Espoo

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Committee membership

1. Tenure review in Polymer Technology (Mauri Kostiainen)
2. Serra Húnter Programme (SHP) fostered by the Government of Catalonia and the Catalan public universities for Appointment of Assistant Professor in UPC-Terrassa
3. Staff Scientist Position at the Department of Chemistry, Aalto University
4. Staff Scientist Position at the Department of Forest Products Technology, Aalto University
5. Tenure track position in Biochemistry, Department of Biotechnology and Chemical Technology
6. Projektipäällikkö (Energiaplatform ja Materiaaliplatform), Aalto University
7. Aalto University Learning Centre Steering Group
8. Aalto University Materials Platform, chair
9. Tappi Research Committe Nnaotechnology of Renewable Materials, co-chair

Opponent duties

1. Jon Trifol ”Novel clay/nanocelluloe biocomposite films and coatings in the context of new packaging materials” The Danish Polymer Centre, DTU, Copenhagen
2. Fanny Hoeng, “Développement d'une encre fonctionnelle à base de nanotubes métalliques « , Grenoble Alpes University, Grenoble
3. Narges Naseri, “Porous materials based on nanopolysaccharides for medical applications: Effect of crosslinking on pore structure and mechanical performance”, Luleå University of Technology, Division of Materials Science, Luleå, Sweden
4. Mohammad Kazemi Pilehrood, “Nanostructured Fiber Materials and Composites for Tissue Engineering”, Tampere University of Technology, Tampere, Finland

Evaluation of Promotion and Tenure

1. Marina Ruths to the rank of Full Professor in the Department of Chemistry of The University of Massachusetts Lowell.
2. Pablo Zavattieri to the rank of Full Professor in the School of Civil Engineering of Purdue University.
3. Pieter Samyn to Junior Professor of Bio-based Materials Engineering, , University of Freiburg.
4. Stefan Spirk for Habilitation or *venia docenci* in “Chemistry and Technology of Bio-materials”, Austria
5. Maria Auad to the rank of Full Professor in the Department of Chemical Engineering, Auburn University.
6. Ryan Toomey to the rank of Full Professor in the Department of Chemical and Biomedical Engineering, University of South Florida.

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Invited talks 2016

1. Nanocelluloses in Multi-phase Systems, Laboratory of Computational Science And Modelling (Cosmo) Laboratory Of Photonic Materials And Fiber Devices (FIMAP), EPFL, **Switzerland**, April 25th, 2016.
2. Development of Lignocellulosic Nano and Microstructures templated from Multiphase Systems, SuMo International Conference from Nano to Macrostructures Design and Characterisation of Soft Materials, 24-26th of August at Strömstad, **Sweden**.
3. Development of Advanced Materials from Lignin and Nano/micro-celluloses, University of Minho in Guimarães, **Portugal**, June 13, 2016.
4. Lignin and Nanocellulose in the formulation of emulsions, formulation-composition maps and material synthesis, 1st International Symposium on Materials from Renewables (ISMR), organized by North Dakota State University and University of Georgia, July, 19-20, **USA**, 2016.
5. Interfacial behavior of carbohydrates: from amphiphilic sugars to cellulose nanocrystals, 28th International Carbohydrate Symposium (ICS), New Orleans, LA, **USA**, July 17-21, 2016.
6. Nanocellulose-water interaction: a necessary evil? Maija Vuoriluoto, Meri Lundahl, Mariko Ago, Maryam, Borghei, Gisela Cunha, Hannes Orelma, Ilari Filpponen and Rojas, O.J., 2016 International Conference on Nanmotechnology for Renewable Materials, Grenoble, **France**, June 13-16, 2016
7. Surface modification of nanocellulose to engineer responsive materials, Qilu University of Technology, Jinan, **China**, July 1, 2016
8. Development of Advanced Materials from Lignin and Nano/micro-celluloses, Jiangnan University, Jiangnan, **China**, June 22, 2016,

9. Nanocellulose in the formulation of emulsions and formulation-composition maps, Jiangnan University, Jiangnan, **China**, June 23, 2016.
10. (Nano)cellulose as support for bio-interfaces and bioactive materials, Jiangnan University, Jiangnan, **China**, June 24, 2016.
11. Nanocelluloses in Multi-phase Systems, Chinese Academy of Scinece,, Beijing, China, July 4, 2016.
12. Surface modification of nanocellulose to engineer responsive materials, Nanjing Forestry University, June 27, 2016, Nanjing, **China**
13. Something about lignin, Beijing Forestry University, Beijing, **China**, July 4, 2016.
14. Nanocellulose-water interactions: From flat films to filaments from wet spinning, Wuhan University, Wuhan, **China**, June 29, 2016.
15. Nanocellulose in the formulation of emulsions and formulation-composition maps, Tappi **Worldwide** Webinar, April 14, 2016
16. Nanocelluloses in Multi-phase Systems, Corporate Headquarters Halliburton Company, Houston, TX, **USA**, May 6, 2016,
17. Some experiences with cellulosic substrates in Workshop Multi-Parametric Surface Plasmon Resonance: From routine Pharma tool to Ångström precision in coatings and material development, 20 April, 2016, DSM, Geleen, the **Netherlands**
18. Soy protein vs. talc for sticky control and strength improvement in papermaking processes, USB TAP Meeting, St Louis, Missouri, **USA**, March 15-17, 2016

19. Nanocelluloses and Multi-phase Systems, Institute of Organic Chemistry, CSIC, September 2016, Madrid, **Spain**
20. Valorization of Lignin in 0D & 1D Advanced Systems: Particles for Emulsification and Fibers For Energy Storage, 5th ISETPP and 3rd IPEC Meeting , November 7-9, 2016, Guangzhou, **China**.
21. Lignocellulose: from emulsions to solar cells, PAN-PACIFIC Conference 2016, October 25-28, 2016, Seoul, **Korea**.
22. Development of Advanced Lignocellulosic Bioproducts templated from Multiphase Systems, Workshop On Insights and Strategies Towards a Bio-based Economy, Montevideo, **Uruguay**, November 22-25, 2016.
23. Fibras de la madera y la pared cellular en el contexto de su uso, APEFIC International Workshop, Corrientes Government, November 29, 2016, Corrientes, **Argentina**

Peer-reviewed journal publications 2016 (34)

Lignin and residual lignocellulosics

1. Borghei M., Loacharoen N., Kibena-Põldsepp E., Johansson L-S., Campbell J., Kauppinen E., Tammeveski K., Rojas O.J., Highly porous heteroatom doped carbon from coconut shells as electrocatalyst for the oxygen reduction reaction: alternative to Pt-C for alkaline fuel cells, **Applied Catalysis B**, 204, 394-402 (2017). DOI: 10.1016/j.apcatb.2016.11.029

2. Sipponen MH., Rojas O.J., Pihlajaniemi V., Lintinen K., Österberg M. Calcium Chelation of Lignin from Pulping Spent Liquor for Water-Resistant Slow-Release Urea Fertilizer Systems, **ACS Sustainable Chem. Eng.** (2016). DOI: 10.1021/acssuschemeng.6b02348

3. Ago M., Huan S., Borghei M., Raula J., Kauppinen E.I., Rojas O.J., High-throughput Synthesis of Lignin Particles (~30 nm to ~2 mm) via Aerosol Flow Reactor: Size Fractionation and Utilization in Pickering Emulsions, **ACS Applied Materials and Interfaces**, 35, 23302–23310 (2016). DOI: 10.1021/acsami.6b07900

4. Ago M., Borghei M., Johannes H., Rojas O.J., Mesoporous carbon soft-templated from lignin nanofiber networks: microphase separation boosts supercapacitance in conductive electrodes, **RSC Advances**, 6, 85802-85810 (2016). DOI: 10.1039/C6RA17536H

5. Ye D-Z., Li S., Lu X., Zhang X., Rojas O.J., Antioxidant and Thermal Stabilization of Polypropylene by Addition of Butylated-Lignin at Low Loadings, **ACS Sustainable Chemistry & Engineering**, 4, 5248−5257 (2016). DOI: 10.1021/acssuschemeng.6b01241

6. Ferrer A., Hoeger I.C., Lu X., Rojas O.J., Reinforcement of polypropylene with lignocellulose nanofibrils and compatibilization with biobased polymers, **Journal of Applied Polymer Science**, 133, 1097-4628 (2016). DOI: 10.1002/app.43854

7. Ferrer A., Salas C., Rojas O.J., Physical, thermal, chemical and rheological characterization of cellulosic microfibrils and microparticles produced from soybean hulls, **Industrial Crops and Products**, 84, 337-343 (2016). DOI:10.1016/j.indcrop.2016.02.014

8. Ago M., Ferrer A., Rojas O.J., Starch-Based Biofoams Reinforced with Lignocellulose Nanofibrils from Residual Palm Empty Fruit Bunches: Water Sorption and Mechanical Strength, **ACS Sustainable Chem. & Eng.**, 4, 5546–5552 (2016). DOI: 10.1021/acssuschemeng.6b01279

Multiphase Systems

9. Carrillo C.A., Nypelö T., Rojas O.J., Double emulsions for the compatibilization of hydrophilic nanocellulose with non-polar polymers and validation in the synthesis of composite fibers, **Soft Matter**, 12, 2721-2728 (2016). DOI: 10.1039/C5SM02578H

10. Domingues A.A., Pereira F.V, Sierakowki M.R., Rojas O.J., Petri D.F.S., Interfacial properties of cellulose nanoparticles obtained from acid and enzymatic hydrolysis of cellulose, **Cellulose**, 23, 2421-2437 (2016). DOI: 10.1007/s10570-016-0965-3

11. Li S., Willoughby J.A., Rojas O.J. Oil-in-water emulsions stabilized by carboxymethylated lignins: Properties and energy prospects, **ChemSusChem**, 9, 2460–2469 (2016). DOI: 10.1002/cssc.201600704

12. Li S., Ogunkoya D., Fang T., Willoughby J.A., Rojas O.J. Carboxymethylated lignins with low surface tension toward low viscosity and highly stable emulsions of crude bitumen and refined oils, **Journal of Colloid & Interface Science,** 482, 27–38 (2016). DOI: 10.1016/j.jcis.2016.07.063

13. Li S., Xiang W., Järvinen M., Lappalainen T., Salminen K., Rojas O.J., Interfacial stabilization of fiber-laden foams with carboxymethylated lignin towards strong nonwoven networks, **ACS Applied Materials and Interfaces**, 8, 19827-19835 (2016). DOI: 10.1021/acsami.6b06418

14. Rivière P., Nypelö T., Rojas O.J., Klug A., Mundigler N., Wimmer R., Space-resolved thermal properties of thermoplastics reinforced with carbon nanotubes, **Journal of Thermal Analysis and Calorimetry**, DOI: 10.1007/s10973-016-5751-9

Cellulose nanocrystals

15. Jin E., Guo J., Yang F., Zhu Y., Song J., Jin Y., Rojas O.J., On the polymorphic and morphological changes of cellulose nanocrystals (CNC-I) upon mercerization and conversion to CNC-II, **Carbohydrate Polymers**, 143, 327-335 (2016). DOI: 10.1016/j.carbpol.2016.01.048

Cellulose nanofibrils

16. Guo J., Fang W., Welle A., Feng W., Filpponen I., Rojas O.J., Levkin P., Superhydrophobic and Slippery Lubricant-Infused Flexible Transparent Nanocellulose Films by Photoinduced Thiol–Ene Functionalization, **ACS Appl. Mater. Interfaces**, 8, 34115–34122 (2016). DOI: 10.1021/acsami.6b11741

17. Lundahl M.J., Cunha A.G., Rojo E, Papageorgiou A.C., Rautkari L., Arboleda J.C., Rojas O.J., Strength and Water Interactions of Cellulose I Filaments Wet-Spun from Cellulose Nanofibril Hydrogels, **Scientific Reports**, 6, 30695 (2016). DOI: 10.1038/srep30695

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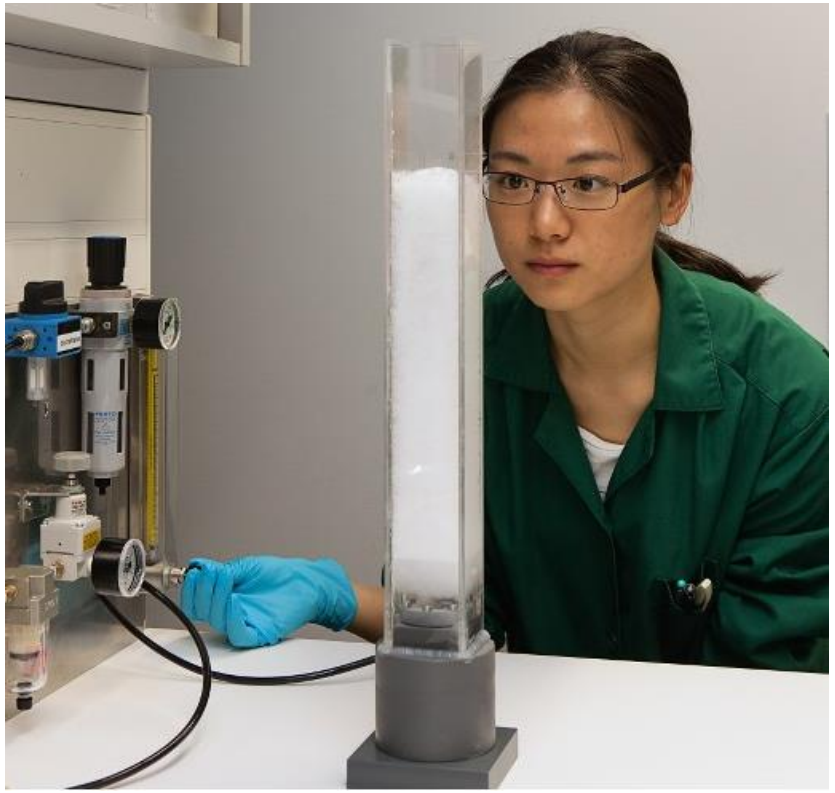
Patents 2016

1. WO2016099537 — 2016-06-23 Additive of chemically-modified cellulose nanofibrils or cellulose nanocrystals.

2. WO2016099534 — 2016-06-23 Additive of cellulose nanofibrils or nanocrystals and a second polymer



CONFERENCE TALKS (list only until March 2011 – need to be updated)

Return

Lundahl, M., Cunha, G., Rojo, E., Orelma, H., Papageorgiou, T., Arboleda, J., Rojas, O.J. Spinnability and water sensitivity of filaments spun from cellulose nanofibril hydrogels, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail (Awarded as best presentation in the session "Biomass & Polymer Extrusion, Composite, & Reaction Technologies: New Insights, Future Potential, & Principles to Practice)

Elnaggar, M., Abdelgawad, A., Salas, C., Rojas, O.J. Biocidal nanofibre system based on curdlan/polyethylene oxide, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Abdelgawad, A., Elnaggar, M., Rojas, O.J. Cellulose acetate/lignin/copper ii-complex nanofiber composites for hygienic applications: Germicidal and deodorizing materials, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Peresin, S., Rojo, E., Rojas, O.J. Comprehensive study on lignin-containing nanocellulose and their effect on properties of the materials made thereof, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Song, J., Jin, E., Yang, F., Rojas, O.J. Interactions between cellulose surfaces and cellulases from different origins studied by QCM, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail
Guo, J., Filpponen, I., Rojas, O.J. Protein separation using magnetically responsive cellulose nanocrystals, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Toivonen, M., Kaskela, A., Rojas, O.J., Kauppinen, E., Ikkala, O. Ambient-dried cellulose nanofibril aerogel membranes with high tensile strength and their use for aerosol collection and templates for transparent, flexible devices, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Fritz, C., Salas, C., Jameel, H., Rojas, O.J. Aggregation behavior of lignin in alkaline solutions studied by dynamic light scattering and rheology, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Kristian Salminen, Timo Lappalainen, Harri Kiiskinen, Meiju Sinkkonen, Rojas, O.J. Effects of external conditions and chemical interactions on the behavior of aqueous cellulose-based foams, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Lu, X., Rojas, O.J., Genzer, J., Efimenko, K., Pourdeyhimi, B. Cellulose nanocrystals as additive and reinforcing agent in melt-spinning of polypropylene, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Song, J., Jin, E., Guo, J., Yang, F., Rojas, O.J. Polymorphic and morphological changes of cellulose nanocrystals during mercerization, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Tayeb, A., Rojas, O.J., Wing, K., Salas, C., Application of soy protein flour as a novel detackifier agent in the recycled pulp, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251,View Session Detail

Lundahl, M., Wang, L., Vuoriluoto, M., Cunha, G., Rojo, E., Orelma, H., Arboleda, J., Johansson, L-S., Borghei, M., Filpponen, I., Rojas, O.J., Nanocellulose-water interactions: From flat films to filaments from wet spinning, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Tripathi, A., Ferrer, A., Khan, S., Rojas, O.J. Micro-nano lignocellulosic fibrils (MNLCF) aerogels from coconut and oil palm tree residuals and application for environmental remediation, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Khakalo, A., Filpponen, I., Rojas, O.J. Protein-assisted interfacial adhesion in thermoforming of cellulose-based composites, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Zhu, J., Chen, L., Rojas, O.J., Production of cellulose nanomaterials with good thermal stability, functionality, and tailored morphologies, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Ago, M., Borghei, M., Rojas, O.J. Free-standing electrospun carbon network from lignin as a conductive electrode for super-capacitance, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

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Borghei, M., Loacharoen, N., Kibena, E., Johansson, L-S., Campbell, J., Tammeveski, K., Rojas, O.J., P dual-doped porous carbon synthesized from coconut husk and chitin as an efficient electrocatalyst for the oxygen reduction reaction, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Rojas, O.J., Salas, C., Goli, K., Ago, M., Genzen, J. Valorization of renewable, plant-based proteins in advanced materials and surface modification, 251 ACS National Meeting, San Diego, CA, March 13-17, 2016. Abstracts of Papers of the American Chemical Society, 251, View Session Detail

Lundahl, M., Wet-spinning of nanocellulose hydrogels. Nordic Rheology Conference, May 2016.

Mobility news (current and former members)

1. Ana Ferrer (BiCMat-US) to Nalco Company, TX
2. Ingrid Hoeger (BiCMat-US) to Kimberly Clark, ATL
3. Soledad Peresin: moves from VTT to Auburn University, AL (faculty position)
4. Ilari Filpponen (BiCMat-FIN): moves from Aalto to Auburn University, AL (research professor position)
5. Carlos Carrillo (BiCMat-US) to Invista, ATL
6. Junlong Song appointed Full Professor in Nanjing Forestry University
7. Justin Zoppe to EPFL

What to expect in 2017

New members:
Kyujeong, Sim, PhD (PD)
Prof. Guillermo Reyes (PD)
Konrad Klockars (MS)
Oriol Cusola, UPC, Spain (1-5, 2017)
Prof. Cristina Castro, PhD (1-3, 2017)
Bruno D. Mattos (3-8, 2017)

- BiCMat Research Ideas Activity ($ prize approved!)
- Aalto visit to India (IIT): Feb 2017
- Group Visit to KTH?
- Group visit to Maribor?
- ACS Conference in SF, March 2017
- Japan Cellulose Society ,October
- Tappi Nanotech Conference (Montreal)
- World Chem Eng Conference (Barcelona)

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