

## Tentative programme

Italic 5

Italian meeting on lignocellulosic chemistry

Science & Technology of Biomasses: Advances and Challenges  
*From forest and agricultural biomasses to high added value products: processes and materials*

September 1-4, 2009  
Villa Monastero, Varenna (Lecco) Italy

and

Workshop of the COST Action BioBIO (FP0602)  
*Biotechnology for lignocellulose biorefineries*

September 2-4, 2009  
Villa Monastero, Varenna (Lecco) Italy

September 1<sup>st</sup>, 2009

## 8.30- 9.40 Registration

### 1. ITALIC 5 Opening

09:20-09:40 by the organizers

### 2. Opening lecture

09:40- 10.20

Chairman Dimitris S. Argyropoulos

9.40-10.20 Aging and conservation of historic cellulosic materials – beyond the macroscopic appearance

*Antje Potthast, Ute Henniges, Thomas Rosenau*

10:20-10.50 *Coffee break*

### 3. Advances in biomass characterization

10:50-12:20

10.50-11.20 High-resolution solution-state NMR of unfractionated plant cell walls

*J. Ralph, F. Lu, H. Kim, D. Ress, D. J. Yelle, B. Nanayakkara, K. E. Hammel, S. A. Ralph, B. Nanayakkara, A. Wagner, T. Akiyama, P. F. Schatz, W. Boerjan, B. Sundberg and M. Hedenström.*

11-20-11.45 On the role of biphenyl structures on lignin reactivity

*J. Sipilä, P. Karhunen, P. Nousiainen, E-L. Tolppa, and M. Orlandi*

11.45-12.20 Characterisation of archaeological waterlogged wood by mass spectrometric techniques

*J.J. Łucejko, F. Modugno, E. Ribechini, M.P. Colombini, J.C. Del Rio*

12:20-14:20 *Lunch*

### Advances in biomass characterization

14:20-12:20

Chairman Tarja Tamminen

14.20-14.45 Raman microspectroscopy in lignocellulosics characterization

*A. S. Jääskeläinen, T. Vuorinen*

14.45-15.10 Fourier transform near infrared spectroscopy to characterise lignocellulosic agro residues

*C. Krongtaew, K. Messner, B. Hinterstoisser, K. Fackler*

15.10-15.35 Structural characterization of suberin isolated from potato

*M.-L. Mattinen, I Filpponen, R Järvinen, B Li, H Kallio, J Buchert, P Lehtinen, D S Argyropoulos*

15:35-16:05 *Coffee break*

Chairman Marco Orlandi

16.05-16.30 Characterization of key functional groups of lignin

*A Toledano, A García, L Serrano, R Llano-Ponte, J Labidi*

16.30-16.55 Liquid Wood - Characterization by <sup>31</sup>P Nmr, <sup>13</sup>C Nmr and Sec

*E. Jasiukaitytė, M. Kunaver, C. Crestini*

16.55-17.20 Analysis of lignans in different plant materials and water sources

*S. Willför and A. Smeds*

19:30 Welcome cocktail

September 2<sup>nd</sup>, 2009

## 4. Novel processes for the isolation and modification of biomass components

09:30-12:25

CHAIRMAN JOHN RALPH

9.30-10.00 Opportunities with dissolved wood

D. S. Argyropoulos

10.00-10.30 Alternative methods for eucalyptus wood hemicelluloses extraction and application in the pulp industry

D. Longue Júnior and J. L. Colodette

10.30-10.40 Analytical techniques for biorefineries, "BioAnTech

S. Willför

10.40-11:10 Coffee break

CHAIRMAN ANTJE POTTHAST

11.10-11.35 Electron-beam induced changes in the surface properties of starch films functionalized by lignins

D. Zheng, B. Pollet, P. Dole, X. Coqueret, J. Soulestin, S. Baumberger

11.35-12.00 Antioxidant activity of ethanolic and aqueous extracts of forest shrubs

Á. Luís, F. Domingues and A. P. Duarte

12.00-12.25 Production of dissolving grade pulps from non-wood paper grade pulps using enzymatic and chemical pre-treatments

M. Ek, D. Ibarra, V. Köpcke

12:25-14:10 Lunch

## 5. Sustainable new products and materials

13:50-16:00

CHAIRMAN DIMITRIS S. ARGYROPOULOS

14.10-14.40 Functional chemicals and polymers from side streams of food industry

Johanna Buchert,

14.40-15.05 Liquefied Lignocellulosic Materials As Adhesives And As A Feedstock For Polymer Synthesis

M. Kunaver, E. Jasiukaityte, N. Čuk, S. Medved

15.05-15.30 Tannins and lignins as binder for wood-based panels

B. Dix

15.30-16:00 Coffee break

## Poster session I

16:00-18:00

**COST BIOBIO (FP0602) Biotechnology for biomass valorisation**  
**16:00-19:00 Opening and WG meetings**

**September 3<sup>rd</sup>, 2009**

09:00-12:30

## **Novel enzymes and applications I**

Chair Claudia Crestini

09:00-09:30 Opening Lecture

Enzymatic coating, grafting and cross-linking of lignocellulosic substrates

G. Guebitz

09:30-09:55 Binding analysis of *Trichoderma reesei* major cellulases with a QCM-D technology

K. Marjamaa, H. Orelma, M. Andberg, S. Holappa, J. Laine and K. Kruus

09:55-10:20 Novel family of hemicellulolytic carbohydrate esterase

P. Biely, X-L Li, M Cotta, C D Skory, V Puchart

10:20-10:50 Coffee break

## **Novel enzymes and applications II**

Chair Liisa Viikari

10:50-11:20 Feruloyl esterases, substrate specificity and their role during enzymatic degradation and separation of plant cell wall material

G. Panagiotou, H. Sunner, L. Olsson

11:20-11:45 Enhancement of laccase production by *Pleurotus ostreatus* breeding for biotechnological purposes

V. Lettera, and G. Sannia

11:45-12:10 Individual and synergistic effects of purified cellulase and hemicellulase components on the rheological behaviour of high-consistency biomass treatments

N. Szijártó, L. Viikari, M. Siika-aho

12:10-14:20 Lunch

## **Enzymatic upgrading of fibre products**

Chair Kriistina Poppius Levlin

14:20-15:35

14:20-14:50 Bioprocessing of lignocellulosic materials.

A. Carvaco Paulo

14:50-15:15 Functionalisation of flax fibres with laccase and natural mediators: development of antimicrobial properties

A Fillat, O Gallardo, Teresa Vidal, F J Pastor, P Díaz, J F Colom, M B Roncero

15:15-15:40 The effect of cellulose-binding domain from *Clostridium cellulovorans* on supramolecular structure of cotton cellulose

D. Ciolacu, J. Kovač, V. Kokol

15:40-16:00 Coffee break

## **Poster Session II**

16:00-17:00

19:30 Social dinner

September 4<sup>th</sup>, 2009

## Advances in value-added bio-based materials and products I

Chair Angel Martinez

09:00-11:40

09:00-09:25 High added-value products from ligno-cellulosic wastes through fungal solid state fermentation processes

*D Iandolo, P Giardina, G Sannia and V. Faraco*

09:25-09:50 Layer by layer immobilised oxidative enzymes in lignin oxidation

*C. Crestini, R Saladino, R Perazzini*

09:50-10:15 Transacetylations to carbohydrates catalyzed by a novel family 2 acetyl xylan esterase from *Cellvibrio japonicus*

*E. Topakas, C. Vafiadi, P. Biely, P. Christakopoulos*

10:15-10:45 *Coffee break*

## Advances in value-added bio-based materials and products II

Chair Giovanni Sannia

10:45-11:10 Upgrading of cellobiose production: a process management approach using commercial enzymes

*C Vanderghem, P Boquel, C Blecker, Michel Paquot*

11:10-11:35 Bacterial cellulose – outstanding biopolymer for biomedical and non-biomedical applications

*F. Miguel Gama, F Dourado*

11:35-12:05 **Closing lecture**

**New Zealand energy forests and the biorefinery proposition**

*P. Hall, M. Jack, I. Suckling, D. van der Pas, J. Lloyd, R. Newman, A. Hickson, G. Lloyd-Jones, K. Torr*

**Closing of the workshops**

12:05-12:15

**COST FP0602 MC meeting**

12:15-13:30

## Poster session I

### **Preparation and sorption properties of Si-containing composite materials based on hydrolysis lignin**

*G Telysheva, T Dizhbite, V Solodovnik, D Evtuguin, A Andersone, A Volperts, L Jashina*

### **Pharmaceutical applications of birch bark extractive betuli**

*S. Alakurtti, N. Sacerdoti-Sierra, L. Pohjala, K. Capcova, C. L Jaffe, P. Tammela, K. D Janda, S. Koskimies and J.i Yli-Kauhaluoma*

### **Acid methanolysis – an analytical tool for estimating the proportions of different pulp types in deinked pulp or recycled paper**

*A. Sundberg, L. Vähäsalo, D. MacNeil and B. Holmbom*

### **Catalytic oxidation of kraft lignin by aqueous polyoxometalates**

*H. Werhan, T. Voitl, P. R. von Rohr*

### **Evaluation of methods for composition, functional groups and molecular mass on a lignin fractionated by ultrafiltration**

*A. Abaecherli, T. Quoc Nguyen, J. Lora, S. Lepifre, R. Gosselink, U. von Arx*

### **Chemical modification of oxidized o-acetyl-galactoglucomannan**

*A-S. Leppänen, P. Eklund, R. Sjöholm, K. Parikka, M. Tenkanen, S. Willför*

### **Improvement of the strength properties of recovered paper by creating new furnish compositions**

*A. Treimanis, L Belkova, M Laka, L Vikele, U Grinfelds, M Skute, S Chernavskaja*

### **Analytical techniques for biorefineries, “BioAnTech**

*S. Willför*

### **Investigation of chemically modified renewable gelatin or hide powder-based thermoplastic films as heavy metals removal from aqueous media**

*A A Haroun, E M Abu Taleb, M A Abd El-Ghaffar*

### **The new composites based on recycled polymer integrating modified wood originated products for obtaining sheet materials**

*G Shulgā, B Neiberte, Verovkins, Laka M., Chernayvskaya,*

### **Lignocellulosic wastes in Turkey**

*E. Imamoglu, F. Vardar Sukan*

### **Introduction of tannin extracts**

*F Bertaud, S Tapin-Lingua, A Pizzi, M Petit-Conil*

### **Organosolv cooking as a facile fractionation method for wood bark**

*H. Mikkonen, S. Alakurtti, A. Suurnäkki*

### **Kinetic model of cellulase treatment of pulp**

*G. Radeva, P. Bikov, I. Valchev*

### **Effect of the pH value of the dispersion solution on the formation and properties of nanocrystalline cellulose and chitosan gels**

*M Laka, S Chernyavskaya*

### **Man-made humic materials for sustainable rehabilitation of degraded soils**

*F. Liebner, G. Pour, T. Rosenau, L. Tyhoda, K. Fischer, E. Brendler*

### **Utilization of municipal waste as a raw material for sugar route biorefinery**

*Matti Siika-aho, Minna Vikman and Marjaana Rättö*

### **Study of the antioxidant capacity of Miscanthus Sinensis lignin**

*A García, A Toledano, I Egües, R Briones, M A Andrés, J Labidi*

### **LigniVal: adding value to lignin**

*T. Tamminen, M. Leskelä, D. S. Argyropoulos, L. Viikari, K. Kolppo, S. Willför, K. Poppius-Levlin, A. Fernyhough, L. Lucia*

### **Sustainable bio-based materials from forest resources**

*A. Lazzeri, B. Cioni, S. Farsetti, S. Tinagli*

### **Life cycle analysis as a tool for ecoinnovation in using wood biomasses**

*S. Sala and V. Castellani*

**New and convenient syntheses of hydroxytyrosol derivatives by oxidation of tyrosol and homovanillyl alcohol present in agroindustrial wastes by homogeneous and heterogeneous 2-iodoxybenzoic acid (IBX)**

*R. Bernini and E. Mincione*

**Bio-refining processes: recovery of secondary chemical building blocks from concentrated olive oil milling waste waters**

*E. Ansaloni, F. Cornia, B. Bonsi, D. Zanichelli, L. Setti*

**Characterisation of archaeological waterlogged wood by Nuclear Magnetic Resonance and Gel Permeation Chromatography**

*A. Salanti, L. Zoia, E-L. Tolppa and M. Orlandi*

**Cellulose nanocrystals as scaffolds for nanodevices**

*I. Filpponen, and D. S. Argyropoulos*

**Catalytic conversion of biomass to platform chemicals**

*A Raspolli Galletti, V De Luise, E Ribechini, M Zanaboni, F Modugno*

**Lignin characterisation and recovery from rice husk**

*J. Causio, G Elegir, F Zanini, M. Orlandi, E-L Tolppa, A Salanti*

**Hot-water prehydrolysis of radiata pine – hemicellulose extraction**

*J. A Lloyd, I. D Suckling, R. W Allison, M. Manley-Harris, J. S McDonald-Wharry, D, Lachenal and C. Chirat*

**High temperature alkali treatment of kraft black liquor**

*M. F Pasco and I. D Suckling*

**Epoxy resins from lignin-derived phenols**

*D. van de Pas, Kirk Torr and Roger Newman*

**Natural mediators in laccase catalysed degradation of lignocellulosic materials. A**

**Study on lignin model compounds with laccases possessing different redox potentials**

*P. Nousiainen, E. Uzan, P. Maijala, A. Hatakka, A. Martinez, M. Asther, A. Lomascolo and J. Sipilä*

**Radical formation on lignocellulosic fibres and related lignin chemical changes: a comparison of methods**

*C. Canevali, L. Zoia*

**<sup>31</sup>P NMR Spin trapping: an new tool for understanding radical mechanisms in lignin chemistry**

*L. Zoia and Dimitris S. Argyropoulos*

**Layer by layer coated oxidative enzymes in lignin oxidation**

*C. Crestini, F. Melone, R. Perazzini<sup>†</sup> and R. Saladino*

**Development of an Italian pretreatment technology, first step of second generation bioethanol production process**

*C. Crestini, F. Melone, A. Battistelli, S. Moscatello, C. A. Labate, G. Scarascia-Mugnozza, A. G. Tomlinson, A. De Stefanis, L. Oriani, A. Frattini, F. La Cara, E. Ionata, T. Milizia, C. Giardi.*

## Poster Session II

**Fungi from forest soils as producers of enzymes applicable in lignocellulose biorefineries**

Petr Baldrian, Petra Popelářová, Věra Merhautová, Vendula Valášková, Jana Voříšková

**Role of the *ooc1* gene of *Hypocrea jecorina* (anamorph: *Trichoderma reesei*) in cellulase expression**

Miklós Gyalai-Korpos, Andre Schuster, Kati Réczey, Christian P. Kubicek and Monika Schmoll

**Antioxidant activity of lignin phenolic compounds extracted from kraft and sulphite black liquors**

H Faustino, N Gil, C Baptista, A P Duarte

**Extraction and characterization of hemicelluloses from cereal brans**

Zsuzsa Sáróssy, Mark Lawther, Anne Belinda Thomsen

**Bioethanol production from pretreated rice hulls by *Escherichia coli* mutant**

E Imamoglu, I Deniz, F Vardar Sukan, M Conk Dalay, S Sargin and G Ongen

**Enzymic processing of brewer's Spent Grain using *Fusarium oxysporum* multienzyme system**

Charilaos Xiros, Maria Moukouli, Evangelos Topakas, Thomas Paschos, & Paul Christakopoulos

**Biorefinery concept in organic agriculture: combined bioethanol and biogas production**

Zsófia Kádár, Piotr Oleskowicz-Popiel, Jens Ejbye Schmidt, Anne Belinda Thomsen

**Heterologous expression of the GlcNAc 2-epimerase and NeuNAc-synthase in *Trichoderma* to construct a N-Acetylneuraminic acid synthesis pathway**

Robert L Mach, Matthias G Steiger, and Astrid R Mach-Aigner

**Fractionation of forage sorghum biomass by Steam explosion for bioethanol production**

Paloma Manzanares, María José Negro, José Miguel Oliva, Felicia Sáez, Mercedes Ballesteros, Ignacio Ballesteros, Gloria Bueno

**Short rotation forestry: production of biomass from plantations of fast growing tree species - possibilities of utilization for energy and chemical use**

Konstatinos Spanos

**Steam pretreatment of hemp hurds for bioethanol production**

Zsolt Barta, José Miguel Oliva, Ignacio Ballesteros, Dóra Dienes, Mercedes Ballesteros, Kati Réczey

**Interconnection of light signaling and cellulase gene expression in *Neurospora crassa* – a conserved phenomenon in ascomycetous fungi?**

Monika Schmoll, Chaoguang Tian, Jianping Sun and N. Louise Glass

**Study of enzyme adsorption on lignocellulosics**

Dóra Dienes, Judit Balogh, Henrik Stålbrand, Kati Réczey

**Effect of poly(ethylene glycol) on enzymatic hydrolysis of different lignocellulosic substrates**

Bálint Sipos, Zoltán Sebestyén, Zsolt Somorai, Dóra Dienes, Emma Jakab, Gábor Várhegyi, Kati Réczey

**Cellulases from a new *Bjerkandera* Sp. and kinetics of cellulose hydrolysis**

C Sàágua, and J C Duarte

**Kinetic model of cellulase treatment of pulp**

Greta Radeva, Petar Bikov, Ivo Valchev

**Cellulase adsorption on lignin-rich residues – activity measurements as a tool to study adsorption mechanisms**

Jenni Rahikainen, Kristiina Kruus, Kaisa Marjamaa, Tarja Tamminen, Liisa Viikari

**Isolation and identification of a new species of the genus *Bjerkandera*, *Bjerkandera paranensis***

Patricia Moreira



**Cellulase impregnation efficiency on wood chips to reduce energy consumption in TMP refining**

*Minna Blomstedt, Terhi Hakala, Katariina Nyman, Jaakko Pere and Sari Liukkonen*

**Bioethanol production from ozonised wheat straw (WS) and macro algae in a multi-layer-reactor**

*Nadja Schultz, Frank Leipold, Zsofia Kadar, Annette Eva Jensen, Tomas Fernqvist and, Anne Belinda Thomsen*

**Differences in substrate specificities of two endoxylanases from glycoside hydrolase family 5**

*Maria Vršanská, M Tenkanen, P Biely*

**From the biopolymer chitin to a highly valuable, pharmaceutically relevant fine chemical: applying an integrated bioprocess technology approach to *Trichoderma***

*Astrid R Mach-Aigner, Matthias G Steiger, and Robert L Mach*

**Evaluation of cellulase preparations produced by *Trichoderma reesei* using pretreated wheat straw as carbon source**

*P Alvira, M J Negro, M Ballesteros, M Gyalai-Korpos, D Dienes*

**Fungal cell wall structure and composition: lessons from the genome sequencing project of *Tuber melanosporum***

*Raffaella Balestrini, Fabiano Sillo, Annegret Kohler, Patrick Wincker, Francis Martin and Paola Bonfante*

**Enzymatic degradation of the hydrogels based on poly(vinyl alcohol) and lignin**

*Diana Ciolacu*

**Development of fungal solid state fermentation processes on vegetable wastes**

*D Iandolo, P Giardina, G Sannia and V Faraco*

**Burley husks as agrobiomass for *Pleurotus ostreatus* growth and laccases production**

*Pino Luciano, Ugo Roggero and Giovanna Cristina Varese*

**Enzymatic modification of industrial lignins. analysis of some properties important for further industrial applications**

*G Sena-Martins, V Lourenço, C Ferreira, P Moreira and Jose C Duarte*

**Chemistry and enzymatic accessibility of novel energy crops - use of silaged and steam exploded feedstocks**

*Annikka Pakarinen, Pekka Maijala, Nóra Szijártó, Frederick Stoddard and Liisa Viikari,*

**Immobilized layer-by-layer peroxidase for dyes oxidation**

*Raffaele Saladino, Melissa Guazzaroni and Claudia Crestini*

**Porphyrins based biomimetic catalysts for dyes degradation**

*Raffaele Saladino, Melissa Guazzaroni, Pietro Tagliatesta and Claudia Crestini*

**The metasecretome: understanding nature's waste disposers**

*Aynsley C Hickson and Gareth Lloyd-Jones*

**Analysis of structures limiting the enzymatic hydrolysis of lignocellulosic residues**

*A. Várnai, M. Siika-aho, L. Viikari*

**Antioxidant properties of Laccase modified natural extracts**

*G. Elegir, C. Scarpellini, M. Orlandi, A. Salanti.*

**Enzyme production by pretreated rape straw for 2nd generation bioethanol**

*Efthalia Arvanitia, Anne Belinda Thomsena, Kati Reczey*