

Workshop Potsdam September 26<sup>th</sup>-28<sup>th</sup>, 2007

## Structure and function of primary and secondary cell walls

### Programme

#### Wednesday, September 26<sup>th</sup>

08:30 - 09:00          Registration

09:00 – 09:15          Welcome

#### **WG1: Biosynthesis and structure of cellulose and polysaccharides**

Chair person: Anne Mie Emons

09:15 – 10:00          Markus Pauly, Sascha Gille, Ulrike Haensel, Mark Ziemann:  
Identification of cell wall mutants by a hydrolase screen (invited talk)

10:00 – 10:25          Lutz Neumetzler, Nicolai Obel, Kazuchika Yamauchi, Ingo Burgert,  
Markus Pauly  
Analysis of mutants with altered xyloglucan (axy) structures using  
Oligosaccharide Mass Profiling (OLIMP)

10:25 – 10:50          Coffee break

10:50 – 11:35          Jordi Chan, Grant Calder, Samantha Fox, Clive Lloyd  
Rotating microtubules and cellulose synthesis (invited talk)

11:35 – 12:00          Jelmer Lindeboom, Anne Mie Emons  
Pattern formation of cellulose microfibrils and cortical microtubules

- 12:00 – 12:25 *Kostya Shundyak, Bela Mulder*  
Emergence and stability of textures of cellulose microfibrils in the plant cell wall
- 12:25 – 12:50 *Andrew Parkin, Adriana Šturcová, J. Paul McLean, Clemens Altaner, Michael C. Jarvis*  
Microfibril width and structure in cellulose from primary walls of celery collenchyma and secondary walls of spruce wood
- 12:50 – 14:00 Lunch

## **WG2: Biosynthesis and modification of lignin**

Chair person: Kurt Fagerstedt

- 14:00 – 14:45 *Kazuhiko Fukushima*  
Formation and structure of lignin in tree xylem (invited talk)
- 14:45 – 15:10 *Kurt Fagerstedt, Kaisa Marjamaa, Eija Kukkola, Sanna Koutaniemi, Tino Warinowski, Teemu H. Teeri, Heidi Holkeri, Taina Lundell*  
Lignification and class III peroxidases of Norway spruce (*Picea abies*)
- 15:10 – 15:35 *Véronique Aguié, Laurence Foulon, Miyuki Takeuchi, David Cronier, Anouk Habrant, Araik Hambardzumyan, Roger Douillard, Brigitte Chabbert*  
Development of cellulose-based model systems for the study of interactions among wall components
- 15:35 – 16:10 Coffee break
- 16:10 – 16:55 *Lacey Samuels*  
New views of cell structure and lignin deposition during wood development (invited talk)
- 16:55 – 17:20 *Gerald Koch, Christian Lehringer, Uwe Schmitt*  
Application of scanning UV microspectrophotometry for the topochemical detection of aromatic compounds in the G-layers of tension wood fibres
- 17:20 – 17:45 *Susanne Huyskens-Keil, Werner B. Herppich*  
CO<sub>2</sub>-mediated effects on biochemical properties of the cell wall and their influence on mechanical attributes of white Asparagus spears

18:00 – 20:00

## Poster session

**P1:** *Véronique Douet, Mustapha Tiouabi, Eliane Abou-Mansour, Brigitte Pollet, Catherine Lapierre, Pia A Stieger*

Mechanical stimuli and vascular tissue differentiation

**P2:** *Tero Kesti, Chun Ye*

Rapid measurement of the microfibril angle of single wood fibres by spectroscopic transmission ellipsometry

**P3:** *Johnny Mukoko Bopopi, Olivier Vandeputte, Mondher El Jaziri, Brigitte Chabbert, Marie Baucher*

Chemical characterization of cell walls from transgenic tobacco overexpressing *PtaRHE1* and *PtaERF1*, two genes linked to vascular development in aspen

**P4:** *Seija Kaakinen, Riikka Piispanen, Satu Lehto, Johanna Pohjanen, Urban Nilsson, Sune Linder, Pekka Saranpää, Elina Vapaavuori*

Effect of nutrient optimisation on Norway spruce wood properties

**P5:** *Paul Ander, Geoffrey Daniel*

Degradation of spruce pulp fibres by HCl and cellulases reflects different action on the fibre cell walls

**P6:** *Wolfgang Graf, Werner B. Herppich, Susanne Huyskens-Keil, Heiner Grüneberg*

Cell wall chemistry and mechanical strength of the peduncle of cut roses

**P7:** *Jana Dlouha, Joseph Gril, Bruno Clair*

Physical aging and its impact on the characterisation of viscoelastic properties of green wood

**P8:** *Frédérique Nolin, Anouk Habrant, Godfrey Neutelings, Simon Hawkins, Brigitte Chabbert*

Peroxidases and lignification in flax stem

**P9:** *Karl Bytebier, Oliver Arnould, R. Arinero*

Mechanical characterization of wood at the submicrometre scale: a prospective study

**P10:** *Mireille Cabané, Nicolas Richet, Rana El Zein, Françoise Huber, Brigitte Pollet, Jacques Banvoy, Pierre Dizengremel, Catherine Lapierre, Patrick Perré, Dany Afif*

Ozone alters cellulose and lignin biosynthesis in tension wood of poplar

18:00 – 20:00

**Poster session (continued)**

**P11:** *Kazuchika Yamauchi, Willie Abasolo, Lutz Neumetzler, Markus Pauly, Ingo Burgert*

Mechanical properties of Arabidopsis hypocotyls treated with XEG

**P12:** *Michaela Eder, Nasko Terziev, Geoffrey Daniel, Ingo Burgert*

Tensile properties of single Norway spruce fibres with different amounts of dislocations

**P13:** *Markus Rüggeberg, Thomas Speck, Ingo Burgert*

Fibre-matrix-transitions in palm trees – structure and mechanics

**P14:** *Sebastian Busch, Anja Liskay, Thomas Speck*

Influence of reactive oxygen species on mechanical properties of wound healing cells

**P15:** *Nicole Schreiber, Notburga Gierlinger, Ingo Burgert, Peter Fratzl, Norbert Pütz*

Investigations on root contraction in red clover (*Trifolium pratense*)

**P16:** *Notburga Gierlinger, Puneet Singla, Julien Ruelle, Bruno Clair*

Chemical imaging of tension wood in tropical rain forest species by Confocal Raman microscopy

**P17:** *Ralf Möller, Markus Pauly, Sarah Hake, Marcel Toonen, Jan B. van Beilen, Elma Salentijn, David Clayton, Dianna Bowles*

Lignocellulose feedstocks for cell wall biorefining

**Thursday, September 27<sup>th</sup>**

**WG4: Relating wood and fibre properties to structure and formation**

Chair person: Pekka Saranpää

08:30 – 09:15

*Peter Fratzl, Ingo Burgert*

From air-humidity driven actuators in plants to biomimetic micro-devices

09:15 - 09:40

*Carole Assor, Tuan Dinh, Philippe Jacquin, Gilles Pilate, Patrick Perré*

Mechanical tests on microsamples of normal and tension wood of poplar upon radial, tangential and longitudinal directions

- 09:40 – 10:05 *Mohammad R. Asgharipour, Lisbeth G. Thygesen*  
The effect of growth conditions on the amount of dislocations in hemp fibres
- 10:05 – 10:30 Coffee break
- 10:30 – 11:15 *Frank W. Telewski, Lothar Koehler, J. Al-Haddad, Kyu-Young Kang, Shawn D. Mansfield, Frank W. Ewers*  
Characteristics of the thigmorphogenetic response in the xylem of F5H over-expressed *Populus tremula* x *P. alba*, clone 717 (invited talk)
- 11:15 – 11:40 *Kristofer Gamstedt, Stig L. Bardage*  
Modelling approaches to three-dimensional hygroelastic behaviour of compression wood and their tracheids
- 11:40 – 12:05 *Jasna S. Stevanic, Lennart Salmén*  
Interaction among polymers in the primary cell wall of Norway spruce (*Picea abies* (L.) Karst.)
- 12:05 – 13:15 Lunch

### **WG3: Formation and induction of reaction wood**

Chair person: Uwe Schmitt

- 13:15 – 14:00 *Brian Butterfield*  
Towards understanding compression wood (invited talk)
- 14:00 – 14:25 *Gilles Pilate, Miyuki Takeuchi, Dominique Arnaud, Annabelle Dejardin, Françoise Laurans, Marie-Claude Lesage-Descauses, Régis Fichot, Franck Brignolas, Jean-Charles Leple.*  
Functional genomics of fibre differentiation in *Populus*
- 14:25 – 14:50 *Primož Oven, Maks Merela, Igor Serša*  
Structural response and moisture alterations in wounded tissues of beech
- 14:50 – 15:15 Coffee break

- 15:15 – 16:00 *Fang Huang, Marcelo K. Zago, Helene Robert, Ab Quint, Carlos S. Ampudia, Remko Offringa*  
Plant AGC protein kinases: a compass that orients auxin-dependent plant growth and –development (invited talk)
- 16:00 – 16:25 *Bruno Clair, Joseph Gril, Pierre Cabrolhier, Francesco Di Renzo, Hiroyuki Yamamoto, Françoise Quignard*  
Structural characterisation of G-layer allows to explain longitudinal shrinkage in chestnuts tension wood
- 16:25 – 16:50 *Luna Goswami, Karin Jungnikl, John Dunlop, Catherine Coutand, George Jeronimidis, Peter Fratzl, Ingo Burgert*  
Enzymatic removal of the G-layer - New insights into its mechanical role

### **Boat Trip & Conference Dinner**

### **Friday, September 28<sup>th</sup>**

- 09:00 – 10:45 Individual working group meetings
- 10:45 – 11:15 Coffee break
- 11:15 – 12:30 Final session
- 12:30 – 14:00 Lunch
- 14:00 – 16:00 Management Committee Meeting