



founded in 1931

GORDON RESEARCH CONFERENCES *frontiers of science*

UNIVERSITY OF RHODE ISLAND, P.O. BOX 984, WEST KINGSTON, RI 02892-0984

PHONE: 401 783-4011 • FAX: 401 783-7644

E-MAIL: grc@grcmail.grc.uri.edu • WORLD WIDE WEB: <http://www.grc.uri.edu>
1997 GORDON RESEARCH CONFERENCE

on Plant Cell Walls

FINAL PROGRESS REPORT

Department of Energy

GRANT NO. DE-FG02-97ER20285

RECEIVED

SEP 13 1999

OSTI

The Gordon Research Conference (GRC) on Plant Cell Walls was held at Tilton School, Tilton, New Hampshire, July 18-22, 1997. The conference was well attended with 106 participants. The attendees represented the spectrum of endeavor in this field coming from academia, industry, and government laboratories, both US and foreign scientists, senior researchers, young investigators, and students.

In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field. There was a conscious effort to stimulate lively discussion about the key issues in the field today. Time for formal presentations was limited in the interest of group discussions. In order that more scientists could communicate their most recent results, poster presentation time was scheduled. In addition to these formal interactions, "free time" was scheduled to allow informal discussions. Such discussions are fostering new collaborations and joint efforts in the field.

I want to personally thank you for your support of this Conference. As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings. If you wish any further details, please feel free to contact me. Thank you.

Dr. Andrew Staehelin
Conference Chair

BOARD OF TRUSTEES: Chair / BARBARA K. VONDERHAAR • Vice Chair / HARRY B. GRAY • JAMES BRISTOL • LOUIS E. BRUS • VICKI CHANDLER • MARY-DEE CHILTON

FRANCIS D'ALIVO • CAROL HANDEWICKER • BARRY HONIG • PAUL ORTIZ DE MONTIELANO • RICHARD NICHOLSON • MARK RAINER • ROBERT SHIFFY

DIRECTOR / CARLYCE B. STOKM • **DIRECTOR EMERITUS /** ALEXANDER M. CRUICKSHANK

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

PLANT CELL WALLS

Tilton School
Tilton, NH
August 17 - 22, 1997

Andrew Staehelin, Chair
Deborah Delmer, Vice Chair

Sunday pm

Plasma Membrane - Cell Wall Interactions

Nicholas Carpita, Discussion Leader

- **KEYNOTE ADDRESS: Bruce Stone** - "Plant cell walls and their components - an evolutionary perspective"
- **Nicholas Carpita** - "A cell-wall protein from *Allium* species that binds to a heparin/fibrin binding domain of human fibronectin"
- **Bruce Kohorn** - "Waks; essential cell wall proteins with tenascin, EGF, and cytoplasmic kinase domains"

Monday am

Cytokinesis and Cell Plate Formation

Andrew Staehelin, Discussion Leader

- **Peter Hepler** - "Cytoskeletal activity during cytokinesis and cell plate formation"
- **Andrew Staehelin** - "Experimental dissection of cell plate assembly"
- **Gerd Jürgens** - "The role of the Arabidopsis KNOLLE protein in cytokinesis-specific intracellular trafficking"
- **Desh Pal Verma** - "The role of phragmoplastin in targeting the Golgi vesicles to the cell plate"
- **Laurie Smith** - "Spatial regulation of cell division and morphogenesis during maize leaf development"
- **Sara Ranck** - "A brefeldin-sensitive process in prophase defines the future site of cell plate attachment during cytokinesis in *Tradescantia* stamen"

Monday pm

Cell Wall Expansion and Expansins

Daniel Cosgrove, Discussion Leader

- **Daniel Cosgrove** - "New insights into expansin functions"
- **Hans Kende** - "Expansins in rapidly elongating deepwater rice internodes"
- **Hans Edelman** - "Growth and osmiophilic particles in coleoptiles"
- **Jocelyn Rose** - "Ripening regulated expansins in tomato and other fruits"

Tuesday am

Biosynthesis of Beta-Glucans

Deborah Delmer, Discussion Leader

- Inder Saxena - "Dissecting *A. xylinum* cellulose-like proteins from higher plants"
 - Deborah Delmer - "The *cclA* genes of cotton and their potential role in cellulose synthesis"
 - Richard Williamson - "Cellulose biosynthesis and the RSW1 gene of *Arabidopsis*"
 - Chris Somerville/Sean Cutler - "The function of cellulose synthase-like genes from *Arabidopsis*"
 - Koichi Mizuno - "Cellulose synthesis of tubulin-containing granules from isolated plasma membranes of higher plant cells"
 - Enrico Cabib - "Regulation of cell wall synthesis in yeast"
-

Tuesday pm

Plant Cell Wall Polysaccharides in Paper

Rajai Atalla, Discussion Leader

- Rajai Atalla - "From forest to the paper machine: The challenge of transforming the plant cell wall into a commercial product"
 - Hiroki Nanko - "Structure and formation of interfiber bonding in paper"
 - Tuyen Nguyen - "The use of polysaccharides as strength additives in the paper industry"
 - William Winter - "Topochemically modified polysaccharide nanoparticles"
-

Wednesday am

Structure-Property Relationships of Industrial Plant Polysaccharides

Joergen Soederberg, Discussion Leader

- Joergen Soederberg - "Pectin applications: Structural changes for new physical property requirements"
 - James BeMiller - "Properties and applications of commercial plant cell wall polysaccharides"
 - Jean-François Thibeault - "Extrusion cooking of pectin-rich materials"
 - Robert Scavetta - "Structure of pentagalacturonic acid as bound by pectate lyase C"
 - Debra Mohnen - "Synthesis of the pectic polysaccharide homogalacturonan"
 - Maureen McCann - "Looking for pectin mutants"
-

Wednesday pm

Arabinogalactan Proteins

Allan Showalter, Discussion Leader

- Anthony Bacic - "What is an arabinogalactan-protein?"
- Allan Showalter - "Cloning and expression of a tomato arabinogalactan-protein"

- **Alice Cheung** - "A pollen tube growth-promoting extracellular matrix glycoprotein"
 - **James Cooper** - "Expression of proline-rich proteins (PRPs) during root development in *Medicago*"
-

Thursday am

Structures and Interactions of Cell Wall Polysaccharides

Keith Roberts, Discussion Leader

- **Keith Roberts** - "What holds a plant together? The dynamics of wall architecture, wall strength, and cell-cell adhesion"
 - **Malcolm O'Neil** - "RG-II, its interactions with boron and heavy metals in growing walls and wine"
 - **Anne Mie Emons** - "A dynamical mathematical model for plant cell wall deposition"
 - **Mike Jarvis** - "Internal structure of cellulose microfibrils from the cell walls of higher plants"
 - **Gladys Cassab** - "Aberrant cell walls of boron-deficient root nodules"
 - **Christopher West** - "Protein-cellulose interactions in the spore coat of the cellular slime mold *Dictyostelium discoideum*"
-

Thursday pm

Xylem Differentiation

Ronald Sederoff, Discussion Leader

- **Ronald Sederoff** - "Unexpected variation in lignin of loblolly pine"
 - **Candace Haigler** - "Cellular determinants of secondary wall patterning in differentiating tracheary elements"
 - **Björn Sundberg** - "Auxin gradients and xylem development"
 - **Ulrich Ryser** - "Structural cell wall proteins in protoxylem development: evidence for a repair process mediated by a glycine-rich protein"
-

EXTERNAL SUPPORT

The following organizations have provided additional financial support for the conference:

Hercules Incorporated
Novartis Corporation
Department of Energy, Division of Energy Biosciences

PLANT CELL WALLS

Tilton School, Tilton, NH
(08/17/97) - (08/22/97)

This was the final registration list for the 1997 Conference on
PLANT CELL WALLS.

Name	Organization	Participation	Status
<u>PETER ALBERSHEIM</u>	UNIVERSITY OF GEORGIA	Attendee	Registered
<u>SHOSHAN M ARAD</u>	BEN-GURION UNIVERSITY OF THE NEGEV	Speaker	Accepted
<u>RAJAI ATALLA</u>	USDA FOREST SERVICE	Speaker	Registered
<u>TONY BACIC</u>	UNIV. OF MELBOURNE	Speaker	Registered
<u>MAOR BAR-PELED</u>	MONSANTO LIFE SCIENCE COMPANY	Poster Presenter	Accepted
<u>JAMES N BENMILLER</u>	PURDUE UNIVERSITY	Speaker	Registered
<u>ALAN B BENNETT</u>	UNIVERSITY OF CALIFORNIA, DAVIS	Poster Presenter	Registered
<u>CHRISTINE BERNHARDT</u>	UNIVERSITY OF VERMONT	Poster Presenter	Registered
<u>G. PAUL BOLWELL</u>	ROYAL HOLLOWAY UNIVERSITY, LONDON	Attendee	Registered
<u>SCOTT BORNEMAN</u>	GENENCOR	Attendee	Accepted
<u>DAVID A BRUMMELL</u>	DNA PLANT TECHNOLOGY	Attendee	Registered
<u>ENRICO CABIB</u>	NATIONAL INSTITUTE OF HEALTH	Speaker	Registered
<u>NICHOLAS C CARPITA</u>	PURDUE UNIVERSITY	Speaker	Registered
<u>GLADYS CASSAB</u>	NATIONAL UNIVERSITY-IBT	Speaker	Registered
<u>ALICE Y CHEUNG</u>	UMASS/AMHERST	Speaker	Registered
<u>IYUNG-TAEG CHO</u>	MSU-DOE PLANT RESEARCH LABORATORY	Poster Presenter	Registered
<u>JIM COOPER</u>	UC SANTA BARBARA	Poster Presenter	Registered
<u>DANIEL J COSGROVE</u>	PENN STATE UNIVERSITY	Speaker	Registered
<u>SEAN CUTLER</u>	CARNEGIE INSTITUTION	Speaker	Registered
<u>ALAN DARVILL</u>	CCRC UNIVERSITY OF GEORGIA	Attendee	Registered
<u>JACQUELINE DE SILVA</u>	UNILEVER RESEARCH	Attendee	Registered
<u>ELENA M DEL CAMPILLO</u>	UNIVERSITY OF MARYLAND	Poster Presenter	Accepted
<u>IVAN DELGADO</u>	DOE-PLANT RESEARCH LAB	Poster Presenter	Registered
<u>DEBORAH P DELMER</u>	UNIVERSITY OF CALIFORNIA, DAVIS	Vice Chair	Registered
<u>GEORGE DUGAN</u>	HERCULES INC.	Attendee	Registered
<u>HANS EDELMANN</u>	UNIVERSITY OF BONN	Speaker	Registered
<u>ANNEIMIE C EMONS</u>	WAGENINGEN AGRICULTURAL UNIV.	Speaker	Registered
<u>JOACHIM G FISAHN</u>	MAX PLANCK INSTITUT	Speaker	Accepted
<u>MONICA FISCHER</u>	NESTLE	Attendee	Registered
<u>MINGGENG GAO</u>	OHIO UNIVERSITY	Poster Presenter	Registered
<u>IVANA GELINEO</u>	COMPLEX CARBOHYDRATE RESEARCH CTR.	Attendee	Registered
<u>FLORENCE GOUBET</u>	CCRC	Poster Presenter	Registered
<u>JOHN H GRABBER</u>	PROTIVA	Poster Presenter	Registered
<u>KRISTEN A HADFIELD</u>	UNIVERSITY OF CALIFORNIA, DAVIS	Poster Presenter	Registered
<u>CANDACE H HAIGLER</u>	TEXAS TECH UNIVERSITY	Speaker	Registered
<u>MARK HARBSTER</u>	DNA PLANT TECHNOLOGY	Attendee	Registered
<u>MAREN HEESE</u>	UNIVERSITAT TUBINGEN	Speaker	Registered
<u>PETER K HEPLER</u>	UNIVERSITY OF MASSACHUSETTS	Speaker	Registered
<u>PETER D HOAGLAND</u>	ERRC, NAA, ARS, USDA	Poster Presenter	Registered
<u>HERMAN R HOFTE</u>	INRA	Poster Presenter	Registered
<u>TERENA L HOLDAWAY-CLARKE</u>	UNIVERSITY OF MASSACHUSETTS	Poster Presenter	Registered
<u>ARLAND T HOTCHKISS</u>	USDA-ARS, ERRC	Poster Presenter	Registered
<u>CARL J HOUTMAN</u>	USDA FOREST PRODUCTS LABORATORY	Poster Presenter	Registered
<u>JADASHI ISHII</u>	FORESTRY & FOREST PROD. RESEARCH INST.	Poster Presenter	Registered
<u>MIKE JARVIS</u>	GLAGOW UNIVERSITY	Speaker	Registered
<u>SATOSHI KANEKO</u>	NATIONAL FOOD RESEARCH INSTITUTE	Attendee	Registered
<u>KENNETH KEEGSTRA</u>	MICHIGAN STATE UNIVERSITY	Poster Presenter	Accepted
<u>HANS KENDE</u>	MICHIGAN STATE UNIVERSITY	Speaker	Registered
<u>MARCIA KIELSZEWSKI</u>	OHIO UNIVERSITY	Poster Presenter	Registered
<u>PAUL KNOX</u>	UNIVERSITY OF LEEDS	Poster Presenter	Registered
<u>BRUCE KOHORN</u>	DUKE UNIVERSITY	Speaker	Registered
<u>JOSHUA Z LEVIN</u>	NOVARTIS	Poster Presenter	Registered
<u>BRUCE M LINK</u>	PENNSYLVANIA STATE UNIVERSITY	Poster Presenter	Registered
<u>JINGJIE LU</u>	THE PSYCHOLOGICAL SOCIETY OF AMERICA	Attendee	Accepted
<u>RICHARD LUC</u>	INSTITUT JACQUES MONOD	Poster Presenter	Accepted

<u>WOLFGANG LUKOWITZ</u>	CARNEGIE INSTITUTION	Poster Presenter	Registered
<u>SUSAN LURIE</u>	VOLCANI CENTER ARO	Attendee	Registered
<u>MAZZ MARRY</u>	JOHN INNES CENTRE	Poster Presenter	Registered
<u>MAUREEN MCCANN</u>	JOHN INNES CANTRE UK	Poster Presenter	Registered
<u>JESLEY MCCARTNEY</u>	UNIVERSITY OF LEEDS	Poster Presenter	Accepted
<u>KOICHI MIZUNO</u>	OSAKA UNIVERSITY	Speaker	Registered
<u>DEBRA MOHNER</u>	COMPLEX CARBOHYDRATE CENTER	Poster Presenter	Registered
<u>TOM MULLINS</u>	UNIVERSITY OF FLORIDA	Poster Presenter	Registered
<u>HIROKI NANKO</u>	INSTITUTE OF PAPER SCIENCE & TECHNOLOGY	Speaker	Registered
<u>ARAM MIGRAN NERSISSIAN</u>	UCLA	Poster Presenter	Registered
<u>PETER M NEUMANN</u>	TECHNION, ISRAEL INST OF TECHNOLOGY	Poster Presenter	Registered
<u>TIUYEN T NGUYEN</u>	HERCULES INCORPORATED	Speaker	Registered
<u>MALCOLM O'NEILL</u>	UNIVERSITY OF GEORGIA	Speaker	Registered
<u>JENS PILLING</u>	MAX PLANCK INSTITUT	Attendee	Registered
<u>SARA RANCK</u>	UNIVERSITY OF MARYLAND	Poster Presenter	Registered
<u>KEITH ROBERTS</u>	JOHN INNES CENTRE	Speaker	Registered
<u>JOCELYN K ROSE</u>	UNIVERSITY OF GEORGIA	Poster Presenter	Registered
<u>WILLIAM H ROTTMANN</u>	WESTVACO COMPANY	Attendee	Registered
<u>ANDREW ROUND</u>	INSTITUTE FOR FOOD RESEARCH	Poster Presenter	Registered
<u>STEPHAN ROY</u>	UNIVERSITY OF MASSACHUSETTS	Poster Presenter	Registered
<u>ULRICH RYSER</u>	UNIVERSITY OF FRIBOURG, CH	Poster Presenter	Registered
<u>INDER SAXENA</u>	UNIVERSITY OF TEXAS, AUSTIN	Speaker	Registered
<u>ROBERT D. SCAVETTA</u>	UNIVERSITY OF CALIFORNIA	Speaker	Registered
<u>FREDERIC SCHMITT</u>	NOVARTIS CROP PROTECTION	Attendee	Registered
<u>RONALD R SEDEROFF</u>	NORTH CAROLINA STATE UNIVERSITY	Speaker	Registered
<u>ALLAN SHOWALTER</u>	OHIO UNIVERSITY	Discussion Leader	Registered
<u>LAURIE SMITH</u>	UNIVERSITY OF CALIFORNIA	Poster Presenter	Registered
<u>BRONWEN SMITH</u>	THE UNIVERSITY OF AUCKLAND	Poster Presenter	Registered
<u>JOERGEN SOEDERBERG</u>	HERCULES, INC.	Speaker	Registered
<u>CHRIS SOMERVILLE</u>	CARNEGIE INSTITUTION OF WASHINGTON	Speaker	Accepted
<u>ANDREW STAEGELIN</u>	UNIVERSITY OF COLORADO	Chair	Registered
<u>NANCY M STEELE</u>	EDINBURGH UNIVERSITY, SCOTLAND	Poster Presenter	Registered
<u>BRUCE STONE</u>	LA TROBE UNIVERSITY	Speaker	Registered
<u>BJORN SUNDBERG</u>	SWEDISH UNIV. OF AGRICULTURAL SCIENCES	Speaker	Registered
<u>JAMES E TAVARES</u>	U.S. DEPARTMENT OF ENERGY	Attendee	Registered
<u>J.F. THIBAUT</u>	INRA-CENTRE DE RECHERCHES DE NANTES	Speaker	Registered
<u>JAMES E THOMPSON</u>	UNIV. OF EDINBURGH	Poster Presenter	Registered
<u>MARY L TIERNEY</u>	UNIVERSITY OF VERMONT	Attendee	Registered
<u>BERT A UIJTEWAAL</u>	NUNHEMS ZADEN BV	Attendee	Registered
<u>DESH PAL S VERMA</u>	OHIO STATE UNIVERSITY	Speaker	Registered
<u>JIM WADE</u>	HERCULES INCORPORATED	Attendee	Registered
<u>BRUCE P WASSERMAN</u>	RUTGERS UNIVERSITY	Poster Presenter	Registered
<u>JUDITH WEBSTER</u>	CRC FOR INDUSTRIAL PLANT BIOPOLYMERS	Poster Presenter	Registered
<u>CHRIS M WEST</u>	UNIVERSITY OF FLORIDA COLLEGE OF MED.	Poster Presenter	Registered
<u>RICHARD WETHERBEE</u>	UNIVERSITY OF MELBOURNE	Poster Presenter	Accepted
<u>ALAN R WHITE</u>	NORTH DAKOTA STATE UNIVERSITY	Poster Presenter	Registered
<u>BILL WILLATS</u>	UNIVERSITY OF LEEDS	Poster Presenter	Registered
<u>RICHARD E WILLIAMSON</u>	AUSTRALIAN NATIONAL UNIVERSITY	Speaker	Registered
<u>WILLIAM T WINTER</u>	SUNY-ESF	Poster Presenter	Registered
<u>HEN-MING WU</u>	UNIVERSITY OF MASSACHUSETTS, AMHERST	Attendee	Registered
<u>RONALD J WULF</u>	WULF ASSOCIATES	Attendee	Accepted

