13th International Chlamydomonas Conference

EMBO Workshop on the Cell and Molecular Biology of Chlamydomonas

May 27- June 1, 2008

Hyères-les-Palmiers, Var, France
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Program
(speakers are shown in bold and underlined.)

Tuesday May 27

Welcome  20:30-20:40

Keynote lecture
Supported by the Centre National de la Recherche Scientifique (France).

20:40-21:30  Sabeeha Merchant
Between a rock and a hard place : concepts in trace element nutrition
Wednesday May 28

Session 1  8:30-9:30 Wednesday May 28
Chlamydomonas and human genetic disorders
Chair : Lynne M. Quarmby

8:30-8:50  Lynne M. Quarmby
Chlamydomonas Deflagellation and Polycystic Kidneys

8:50-9:10  K. Lechtreck, P. Delmotte, M. L. Robinson, M. J. Sanderson, and
George B. Witman
Chlamydomonas as a model for hydrocephalus

9:10-9:30  Claire Remacle, Nadine Coosemans, Véronique Larosa, Pierre Cardol, Nathalie Bonnefoy
Chlamydomonas reinhardtii: a promising system to reconstruct human pathogenic
mutations in mitochondrial complex I genes

Session 2  9:30-10:30 Wednesday May 28
Basal bodies
Chair : Masafumi Hirono

9:30-9:50  Masafumi Hirono, Yuki Nakazawa, Madoka Hiraki, and Ritsu Kamiya
Mechanism for establishing the 9-fold symmetry of the centriole structure - A role of
the cartwheel

9:50-10:05  Brian P. Piasecki and Carolyn D. Silflow
The uni2 mutant of Chlamydomonas reinhardtii provides insights into the pathway of
axonemal assembly

10:05-10:20  Kerstin Brachhold and Michael Melkonian
Identification and localization of novel basal body proteins

10:20-10:30  General discussion
Session 3  11:00-13:00 Wednesday May 28

Development
Chair: Stephen Miller

11:00-11:10  Stephen Miller
Introduction

11:10-11:30  Ichiro Nishii, Koichi Ishida, Jun Kadota, Hiroko Toyooka, Noriko Ueki

*invD* and *invE* genes control the change in cell shape that is required for inversion of *Volvox* embryos

11:30-11:45  Alexandra Harryman, Ichiro Nishii, and Stephen M. Miller
Expression Analysis of the *regA* Group *VARL* Genes: Implications for *VARL* Function in Cellular Differentiation

11:45-12:00  Patrick Ferris, Ichiro Nishii, Hisayoshi Nozaki, David Kirk and James G. Umen
The *Volvox carteri* mating locus

12:00-12:20  Ursula Goodenough and Jae-Hyeok Lee
Homeoproteins, Sex, and the Algal/Land-Plant Divergence

12:20-12:35  Munevver Aksoy and Charlene L. Forest
Cloning gamete fusion genes in *Chlamydomonas reinhardtii*

12:35-12:50  Qian Wang, Yi-Heng Hao, Sanjiv Shah, Wenze Liu, Gang Yu and William J. Snell
Essential role of γ-secretase during fertilization in the unicellular green alga

12:50-13:00  General discussion
Session 4  15:00-17:00 Wednesday May 28

Organelles
Chair: Saul Purton

15:00-15:10  Saul Purton
Introduction

15:10-15:30  Sara L. Zimmer, Gadi Schuster and David B. Stern
Functional explorations of chloroplast poly(A) polymerase and polynucleotide phosphorylase

15:30-15:45  James Uniacke and William Zerges
RNA granules transiently receive chloroplast mRNAs from polysomes during stress

15:45-16:05  Y. Choquet, C. Raynaud, C. Loiselay, B. Derrien, A. Boulouis, J. Girard-Bascou and F.-A. Wollman
Regulation of cytochrome f expression

16:05-16:20  Christian Schwarz, Ingolf Elles, Jörg Nickelsen
Regulatory complexes for posttranscriptional steps of chloroplast gene expression in Chlamydomonas

Involvement of heme and Mg-tetrapyrroles in retrograde signaling by the chloroplast

16:35-16:50  Obed W. Odom, Kwang-Hyun Baek, Radhika N. Dani, and David L. Herrin
Chlamydomonas chloroplasts can use short dispersed repeats (SDRs) and multiple pathways to repair a double-strand break in the genome

16:50-17:00  General discussion
Posters I  17:00-19:00 Wednesday May 28
Numbers 0201 - 0814

Special lectures  20:30-21:30 Wednesday May 28

20:30-21:00  David Baulcombe
Silencing RNA in Chlamydomonas and Arabidopsis

21:00-21:30  Michel Bornens
Origin and continuity of the centrosome
Thursday May 29

**Session 5  8:30-9:30 Thursday May 29**

**Circadian rhythms**
*Chair Maria Mittag*

8:30-8:35  **Maria Mittag**
Introduction

8:35-8:55  **Takuya Matsuo**, Kazuhisa Okamoto, Kiyoshi Onai, Yoshimi Niwa, Kosuke Shimogawara, Masahiro Ishiura
Systematic identification of circadian clock components in *Chlamydomonas reinhardtii*

8:55-9:10  **Stefanie B. Seitz**, Olga Voytsekh, Dobromir Iliev, and Maria Mittag
Temperature integration of the circadian RNA-binding protein CHLAMY1

An endogenous oscillator is not involved in the timing of cell division in the alga *Chlamydomonas reinhardtii*

9:25-9:30  **General discussion**
Session 6  9:30-13:00 Thursday May 29

Flagella
Chair: Lotte Pedersen

9:30-9:40  **Lotte Pedersen**
Introduction

9:40-10:00  **Stephen M. King** and Ramila S. Patel-King
Outer arm dynein regulation through a motor-light chain-tubulin ternary complex

10:00-10:20  Radhika Gopal, Mei Wei, David Mitchell and **Pinfen Yang**
Regulation of 9+2 flagellar beating

10:20-10:35  **Takashi Ishikawa**, Khanh Huy Bui, Tandis Movassagh, Hitoshi Sakakibara, Kazuhiro Oiwa
Structural analysis of dynein arms from *Chlamydomonas* flagella revealed by electron cryo-tomography

10:35-11:05  Coffee break

Structural and biochemical properties of the outer-dynein-arm docking complex (ODA-DC) studied using recombinant proteins

11:20-11:35  **Maureen Wirschell**, Chun Yang, Pinfen Yang, Laura Fox, Haru aki Yanagisawa, Ritsu Kamiya, George Witman, Mary Porter, and Winfield S. Sale
Defining I1-dynein interactions—IC97 interacts with both regulatory and structural components of I1 and the axoneme

11:35-11:50  Jessica Belen-Rivera, Ashley Solmonson, Vincent Maresca, Terah McClendon, Joshua Farthing, Victoria Alfaro, and **Anne R. Gaillard**
Dissection of cyclic nucleotide signaling pathways in flagellar axonemes of *Chlamydomonas*

11:50-12:10  Chunlei Gao, Noveera Ahmed, Judy Freshour and **David R. Mitchell**
Mutations defining the pathway of outer row dynein assembly
12:10-12:25  **Carlo Iomini**, Linya Li and Susan K. Dutcher
Intraflagellar transport (IFT) components IFT139A and IFT144A function in the same pathway to regulate retrograde movement and stability of IFT particles

12:25-12:40  Tian Piao, Minna Luo, Yan Guo, De Li, William J. Snell, Peng, Li, and **Junmin Pan**
Characterization of a homologue of microtubule depolymerizer during flagellar disassembly in *Chlamydomonas*

12:40-13:00  **General discussion**
Session 7  15:00-17:00 Thursday May 29

Light perception
Chair: Peter Hegemann

15:00-15:20  P. Berthold, S.P. Tsunoda, O.P. Ernst, D. Gradmann and Peter Hegemann
Channelrhodopsin-1 initiates phototaxis and photophobic responses in Chlamydomonas by immediate light-induced depolarization

Channelrhodopsins from C. reinhardtii: Characterization and applications

15:40-16:00  V. Wagner, K. Ullmann, A. Mollwo, M. Kaminski, M. Mittag
Georg Kreimer
Analysis of the eyespot phosphoproteome from Chlamydomonas reinhardtii

16:00-16:20  Telsa M. Mittelmeier, Mary Rose Lamb, and Carol L. Dieckmann
Cytoskeletal asymmetry influences eyespot localization in Chlamydomonas

16:20-16:35  William Inwood, Corinne Yoshihara, Reena Zalpuri, Kwang-Seo Kim and Sydney Kustu
The ultrastructure of a Chlamydomonas reinhardtii mutant strain lacking phytoene synthase resembles that of a colorless alga

16:35-16:50  Collin Capano, Jureepan Saranak, Kenneth Foster
The systems biology of Chlamydomonas phototaxis as determined by electric current and ciliary beating

16:50-17:00  General discussion
Posters I  17:00-19:00 Thursday May 29
Numbers 0201 - 0814

Session 8   20:30-22:00 Thursday May 29

Workshop: Molecular Toolbox
Chairs: Claire Remacle and Michael Hippler

20:30-20:35
Introduction

20:35-20:55  Juliane Neupert, Daniel Karcher, and Ralph Bock
Generation of Chlamydomonas strains that efficiently express transgenes

20:55-22:00  Short presentations and discussion
Friday May 30

Session 9  8:30-10:30 Friday May 30

Nutrients, Growth, Cell cycle
Chair: Hideya Fukuzawa

8:30-8:50  **Hideya Fukuzawa**, T. Yamano, Y. Yamahara, T. Tsujikawa, H. Nakano, T. Kohinata

Genes associated with the induction of the carbon-concentrating mechanism in *Chlamydomonas reinhardtii*: Functional roles of CCM1 and LCIB in photosynthetic acclimation to CO$_2$-limiting stress

8:50-9:05  **Amaya Blanco-Rivero**, Flor Martínez, Maria Turkina, Alexander Vener, Göran Samuelsson and Arsenio Villarejo

Acclimation to low CO$_2$ concentrations in the green alga *Chlamydomonas reinhardtii*. A sub-organellar phosphoproteomic survey of the potential transduction pathways

9:05-9:25  **Emilio Fernández**, Manuel Tejada-Jiménez, Antonio Camargo, Ángel Llamas, Amaury de Montaigu, Emanuel Sanz-Luque, Jose J. Higuera, David González-Ballester, Rogene A. Schnell, Paul A. Lefebvre, Aurora Galván

Nitrate assimilation in *Chlamydomonas* as a model system to other organisms

9:25-9:45  Su-Chiung Fang and **James G. Umen**

A screen for targets of the RB tumor suppressor pathway in *Chlamydomonas*

9:45-10:00  **Kateřina Bišová**, Monika Hlavová, Dáša Umysová, James G. Umen, Vilém Zachleder

Overexpression of WEE1 kinase promotes resistance to DNA damage in *Chlamydomonas reinhardtii*

10:00-10:15  **Severin Sasso**, Martin T. Croft, Katherine E. Helliwell, Olivia L. Paterson, Alison G. Smith

*Chlamydomonas reinhardtii* and *Mesorhizobium loti* as a model system for a novel symbiosis

10:15-10:30  General discussion
**Session 10**  11:00-13:00 Friday May 30

“Omics”: Genome-enabled research  
*Chair: Arthur Grossman*

11:00-11:10 **Arthur Grossman**  
Introduction


Comparative genomics of *Volvox carteri* and *Chlamydomonas reinhardtii*: clues to the evolution of algal multicellularity.

11:30-11:50 **Ariane Atteia**, Annie Adrait, Sabine Brugière, Robert van Lis, Marianne Tardiff, Jérôme Garin, Jacques Joyard, William Martin, and Norbert Rolland

*Chlamydomonas reinhardtii* mitochondria as revealed by proteomics

11:50-12:05 **Christian Bölling** and Lothar Willmitzer

Metabolomic analysis of sulfur deficiency in *Chlamydomonas reinhardtii*

12:05-12:20 **An Jamers**, Jones O.A.H., Blust R. and De Coen W.

Oomics in algae: transcriptomics and metabolomics of the cadmium exposed green freshwater alga *Chlamydomonas reinhardtii*


Towards Experimental Verification of Protein Coding Transcripts and Comprehensive Metabolic Network Modeling of *Chlamydomonas reinhardtii*

12:35-12:45 **Ralph Bock**

Towards systems biology of photosynthesis

12:45-13:00 **General discussion**
13:00-17:00  Friday May 30

Free afternoon.

Posters II  17:00-19:00 Friday May 30
Numbers 0901 - 1508

Banquet  19:00-21:00

Historical perspective  21:00-21:30 Friday May 30
21:00-21:30  Paul Levine
Chlamydomonas research – Its early foundation

Chlamydomonas Biotech  21:30-22:00  Friday May 30

Peter Heifetz:  Rincon Pharmaceuticals, Inc.
Stefan Surzycki:  PhycoBiologics, Inc.
Session 11  8:30-10:30 Saturday May 31

Hydrogen and biofuels
*Sponsored by: Région Provence Alpes Côte d’Azur.*
*Chair: Olaf Kruse*

8:30-8:45  Olaf Kruse
Introduction

8:45-9:05  Maria Ghirardi
Algal Hydrogen Photoproduction: Properties and Applications

9:05-9:25  Martin Winkler, Gregory von Abendroth, Christina Kamp, and
*Thomas Happe*
Characterization of the key enzymes involved in hydrogen production in green algae

9:25-9:45  Gilles Peltier, Carine Desplats, Florence Mus, Stéphan Cuine, Laurent Coumec, Bart Ghysels, Frédéric Jans, Emmanuel Minolet, Pierre-Alain Houyoux, Pierre Cardol, Fabrice Franck and Claire Remacle
A type II NAD(P)H dehydrogenase in *Chlamydomonas* chloroplasts

Flexibility of algal anaerobic metabolism: relevance to hydrogen production

10:05-10:20  Anja Hemschemeier, Jacobs J., Kravietz D., Philipps G., Rühle T. and Happe T
*Chlamydomonas* – a survivalist under anaerobic conditions

10:20-10:30  General discussion
Session 12   11:00-13:00 Saturday May 31

Acclimation
Chair: Giovanni Finazzi

11:00-11:10  Giovanni Finazzi
Introduction

11:10-11:30  Rik I. L. Eggen, Régine Dayer and Beat B Fischer
Regulation and function of photo-oxidative stress induced crGPX5/GPXH in *Chlamydomonas reinhardtii*

11:30-11:50  Stéphane D. Lemaire, Laure Michelet, Mirko Zaffagnini, Hélène Vanacker, Michael Schroda, Paolo Trost, Paulette Decottignies
Redox regulation by glutathionylation and glutaredoxins in *Chlamydomonas*

11:50-12:05  Britta Förster, Ulrike Mathesius, Barry Osmond, Barry Pogson
Changes in chloroplast physiology and whole cell protein profiles of *Chlamydomonas* mutants under high light and oxidative stress

12:05-12:20  Anchalee Sirikhachornkit, Jai W. Shin, Irene Baroli, and Krishna K. Niyogi
β-Tocopherol is better than α-tocopherol at protecting *Chlamydomonas reinhardtii* from photo-oxidative stress

12:20-12:35  Barbara B. Sears, Ngoc Nguyen, Matthew Enell, Allison Blaine, Ethan Dawson-Baglien, and Ryan Mayle
Photo-oxidative stress and chloroplast DNA mutation

12:35-12:50  Sonja Werner, Matthias Bauch, Armin Hallmann, Judith Köhler, Georg Schmidt, Martin Lohr
Massive accumulation of ketocarotenoids in zygospores of *Chlamydomonas reinhardtii*

12:50-13:00  General discussion
Session 13  15:00-17:00 Saturday May 31

Workshop: Genomes
Chairs: Laurie Mets and Olivier Vallon
Short presentations and discussions

Posters II  17:00-19:00 Saturday May 31
Numbers 0901 - 1508

Poster awards  20:30-20:45 Saturday May 31
Sponsored by Rincon Pharmaceuticals and EMBO Reports.

Special lectures  20:45-21:15 Saturday May 31

20:45-21:15  Jean-David Rochaix
Tracking thylakoid protein kinases from Chlamydomonas to Arabidopsis
Sunday June 1

Session 14  8:30-10:30 Sunday June 1

Photosynthesis
Chair: Francis-André Wollman

8:30-8:40  Francis-André Wollman
Introduction

8:40-9:00  Kevin Redding, Marc Müller, Rajiv Luthra, Chavdar Slavov, Audrius Jasaitis, Stefano Santabarbara, Alfred R. Holzwarth, Fabrice Rappaport

P700 is not the primary electron donor in Photosystem I: a new model of charge separation

9:00-9:20  Yuichiro Takahashi

Dynamics of Photosystem I structure and function

9:20-9:35  Frédéric Jans, Emmanuel Mignolet, Pierre-Alain Houyoux, Pierre Cardol, Fabrice Franck and Claire Remacle

A novel nucleus-encoded, chloroplastic NAD(P)H dehydrogenase is involved in non-photochemical plastoquinone reduction and in the control of state transitions in Chlamydomonas reinhardtii

9:35-9:50  Fabrice Franck, Monique Dinant, Pierre Cardol, Claire Remacle and René-Fernand Matagne

Importance of the alternative pathway of respiration for avoidance of ROS production and for optimisation of photosynthesis in Chlamydomonas


A novel c-type cytochrome maturation system is required for oxygenic photosynthesis


Early Gene Duplication within Chloroplastida and its correspondence with Relocation of Starch Metabolism to Chloroplasts

10:20-10:30  General discussion
**Session 15**  11:00-13:00 Sunday June 1

**Gene expression**  
*Chair: Michael Schroda*

**11:00-11:10 Michael Schroda**  
Introduction

**11:10-11:25 Laurence Maréchal-Drouard**  
Steady-state levels of imported tRNAs in *Chlamydomonas* mitochondria are correlated with both cytosolic and mitochondrial codon usages

Small RNA-guided gene silencing pathways in *Chlamydomonas*

**11:45-12:00 Tao Zhao, Guanglin Li, Shijun Mi, Shan Li, Gregory J. Hannon, Xiu Jie Wang, and Yijun Qi**  
A Complex System of Small RNAs in the Unicellular Green Alga *Chlamydomonas reinhardtii*

**12:00-12:15 Tomohito Yamasaki and Takeshi Ohama**  
Heterochromatinization of inverted repeat transgene and candidate genes related to its transcriptional repression

**12:15-12:30 Scott Shaver, Armando Casas-Mollano, James Fenlon, and Heriberto Cerutti**  
Epigenetic Mechanisms of Transcriptional Gene Silencing in *Chlamydomonas* Elucidated through Genetic and Functional Genomics Approaches

**12:30-12:45 Michael Moulin, M.T. Croft, M.E. Webb, Z. N. Balia Yusof and A.G. Smith**  
Vitamin B1 metabolism in *Chlamydomonas reinhardtii* is regulated by a riboswitch mediated feedback loop

**12:45-12:55 General discussion**

**12:55-13:00 Farewell**