

Current Research in Photosynthesis

Volume IV

*Proceedings of the VIIIth International Conference on Photosynthesis
Stockholm, Sweden, August 6–11, 1989*

edited by

M. BALTSCHIEFFSKY

*Department of Biochemistry,
University of Stockholm,
Stockholm, Sweden*



KLUWER ACADEMIC PUBLISHERS

DORDRECHT / BOSTON / LONDON

Library of Congress Cataloging in Publication Data

International Congress on Photosynthesis (8th : 1989 : Stockholm, Sweden)

Current research in photosynthesis : proceedings of the VIIth International Congress on Photosynthesis, Stockholm, Sweden, August 6-11, 1989 / edited by M. Baltscheffsky.

p. cm.

ISBN 0-7923-0587-6 (set)

1. Photosynthesis--Congresses. 2. Photosynthesis--Research--Congresses. I. Baltscheffsky, Margareta. II. Title.

QK882.I55 1989
581.1'3342--dc20

89-48127

ISBN 0-7923-0588-4 (Vol. I)

ISBN 0-7923-0589-2 (Vol. II)

ISBN 0-7923-0590-6 (Vol. III)

ISBN 0-7923-0591-4 (Vol. IV)

ISBN 0-7923-0587-6 (Set)

Published by Kluwer Academic Publishers,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

Kluwer Academic Publishers incorporates
the publishing programmes of
D. Reidel, Martinus Nijhoff, Dr W. Junk and MTP Press.

Sold and distributed in the U.S.A. and Canada
by Kluwer Academic Publishers,
101 Philip Drive, Norwell, MA 02061, U.S.A.

In all other countries, sold and distributed
by Kluwer Academic Publishers Group,
P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Printed on acid-free paper

All Rights Reserved

© 1990 by Kluwer Academic Publishers

No part of the material protected by this copyright notice may be reproduced or utilized in any form or by any means, electronic or mechanical including photocopying, recording, or by any information storage and retrieval system, without written permission from the copyright owner.

Printed in The Netherlands

Bayerische
Staatsbibliothek
München

GENERAL CONTENTS

Volume I

1. Reaction Centers From Purple Bacteria 1
2. Photosystem II 209
3. O₂ Evolution 675

Volume II

4. Prokaryotic Antennae Systems 1
5. Eukaryotic Antennae Systems 209
6. Photoinhibition 349
7. Photosystem I 523
8. Structure, Function and Dynamics of the Thylakoid Membrane 715

Volume III

9. H⁺ ATPases 1
10. Cytochrome B/C₁ and B/F Complexes 221
11. Rubisco 323
12. Structure, Function and Regulation of Photosynthetic Genes 423
13. Biosynthesis and Assembly of the Photosynthetic Apparatus 653
14. Chloroplast Differentiation 827

Volume IV

15. Respiration and Photosynthesis 1
16. Regulation of Chloroplast Metabolism 111
17. Adaptation Mechanisms 291
18. CO₂ Concentrating Mechanisms 433
19. Stress and Photosynthesis 549
20. Photosynthesis in Nature 821

CONTENTS TO VOLUME IV

General Contents	V
Contents Volume IV	VII
Preface	XXI
Acknowledgements	XXIII
Organizing Committees	XXV
Opening Speech	XXVII
15. Respiration and Photosynthesis	
Transfer of Redox Equivalents Between Subcellular Compartments of a Leaf Cell H.W. Heldt, D. Heineke, R. Heupel, S. Krömer, B. Riens	1
Photorespiratory Dependent Leaf Mitochondrial ATP Production P. Gardeström, B. Wigge	9
Photorespiratory Metabolism and Pigment Changes in Photorespiration Mutants P.J. Lea, R.D. Blackwell, K.J. Lewis, A.J. Young, G. Britton	15
The pH Stat of Chloroplasts in Relation to Ribulose Bisphosphate Carboxylase Activity and Inorganic Nitrogen and Sulphate Assimilation I.R. Kennedy	23
The Light Response of CO ₂ Gas Exchange and Internal CO ₂ Concentration Separated for the Upper and Lower Side of a Maize Leaf W. Postl, H.R. Bolhar-Nordenkamp	31
Using Whole Plant Net CO ₂ Exchange Data for Predicting Productivity of Greenhouse Roses J. Jiao, M.J. Tsujita, B. Grodzinski	35
Photosynthesis Dark Respiration and Plant Production in <i>Nicotiana tabacum</i> Genotypes Derived from Haploids Selected by Low CO ₂ Survival E. Delgado, J. Azcon-Bieto, H. Medrano	39
ATP Deprivation Induces State I to State II Transition in the Dark in <i>Chlamydomonas reinhardtii</i> P. Gans, L. Bulte, F. Rebeille, F.-A. Wollman	43
Effect of the Salinity on the ATPase Activity (CF ₁ , F ₁) Electron Transport in Photosystems I, II and Respiratory Chain in <i>Medicago sativa</i> and <i>Amaranthus hypochondriacus</i> M.S. González, M.J. Vázquez, Z.R. Quintanar, G.R. Velasco	47
Interaction of the Photosynthetic and Respiratory Electron Transport Chains of <i>Rhodobacter sphaeroides</i> S. Brown, J.P. Armitage	51

VIII

The Effect of Low Intensity Blue Light on the Rates of Respiration and Photosynthesis, Composition and Growth of <i>Lemna gibba</i> J. Gale, G. Granot, M. Zeroni, J. Reubeni	55
Glycine Oxidation in Green and Etiolated Tissue P. Gardeström, D. Henricson, B. Wigge	59
Upshift of Light Intensity on <i>Synechocystis</i> 6714 Causes Increases in Glycogen, Respiration, and P700 Reduction J. Myers	63
Does NADH Availability Limit Nitrate Reduction in Wheat Genotypes? M.Z. Abdin, P.A. Kumar, Y.P. Abrol	67
The Effect of H ₂ O ₂ on the Photosynthetic Biochemistry of <i>Pisum sativum</i> L. Ford, N.W. Pammenter, A.M. Amory, C.F. Cresswell	71
Use of Computer Simulation and Non-Linear Regression in Photosynthetic Studies A.M. Amory, N.W. Pammenter, C.F. Cresswell	75
Photosynthesis, Photorespiration and Partitioning in Leaflets, Stipules and Tendrils of <i>Pisum sativum</i> R. Côté, B. Grodzinski	79
Effects of Glucose Feeding on Photoautotrophic Cell Suspension of <i>Dianthus caryophyllus</i> M.H. Avelange, F. Sarrey, F. Rebeille	83
Affinity Labeling of Phosphoribulokinase by Adenosine Polyphosphopyridoxals H.M. Miziorko, C.A. Brodt	87
Catalase in an Aerobic Photosynthetic Bacterium, <i>Erythrobacter</i> sp. OCH 114 M. Morita, K.-I. Takamiya	91
Immunocytochemical Localization of the Electron Carrier Proteins Ferredoxin-NADP ⁺ Oxidoreductase and Cytochrome <i>c</i> 553 in the N ₂ -Fixing Cyanobacterium <i>Anabaena variabilis</i> A. Serrano, P. Gimenez, S. Scherer, P. Böger	95
A Soluble Polysaccharide Fraction from Higher Plants: A Possible Physiological Substrate of the Cytosolic Phosphorylase Isozyme Y. Yang, B. Greve, M. Steup, E.W. Weiler	99
The Effect of Photosynthesis on Different Steps of Dark Respiration N. Mamushina, H. Zubkova, L. Filippova	103
Photosynthesis as a Thermal Process G.G. Komissarov	107
16. Regulation of Chloroplast Metabolism	
Regulation of Light Harvesting by Metabolic Events P. Horton	111
Regulation of Ribulose Bisphosphate Carboxylase Activity by Rubisco Activase: Aspects of the Mechanism A.R. Portis, Jr., S.P. Robinson, R. McC. Lilley	119
Redox-Regulation of Chloroplast Enzymes: Mechanism and Physiological Significance R. Scheibe	127
Light/Dark-Regulation of C ₄ -Photosynthesis Enzymes by Reversible Phosphorylation R. Chollet, R.J.A. Budde, J.-A. Jiao, C.A. Roeske	135

Purification and Characterization of Phosphoribulokinase from N ₂ Fixing Cyanobacterium <i>Nostoc muscorum</i> D.V. Amla	143
Molecular Models of 3-Dimensional Structures of Chloroplast and Cytoplasmic Phosphoglycerate Kinase from Wheat E.M. McMorro, B.J. Sutton, J.W. Bradbeer	147
The Regulation of Synthesis of Chloroplastic and Cytosolic Isoenzymes of Phosphoglycerate Kinase in Barley N. Shah, J.W. Bradbeer	151
A Comparison of the Regulation of Yeast Phosphoglycerate Kinase with the Isoenzymes of Barley Chloroplast and Cytosol E.M. McMorro, J.W. Bradbeer, P.O. Montiel-Canobra, M. Larsson-Raźnikiewicz	155
Relationship Between the Primary Structure of Ferredoxin and Thioredoxin and Their Reactivity J.P. Jacquot, F. de Lamotte, M. Miginiac-Maslow, R. Peyronnet, J.B. Peyre, E. Wollman, P. Decottignies	159
<i>In Vivo</i> Synthesis and Immunological Relationship of Thioredoxin <i>f</i> from Pea and Spinach A. Chueca, M. Sahrawy, J.L. Carrasco, J.L. Ramos, J.J. Lázaro, R. Hermoso, J. López Gorgé	163
Primary Structures of Regulatory Proteins of the Ferredoxin-Thioredoxin System of Spinach Chloroplasts R. Schürmann, L. Gardet-Salvi, M. Kamo, K. Yano, A. Tsugita	167
Regulation of Photosynthesis: Photosynthetic Control and Thioredoxin-Dependent Enzyme Regulation D. Lechtenberg, B. Voss, E. Weis	171
Function of Two Dissimilar Thioredoxins in the Cyanobacterium, <i>Anabaena</i> sp. 7120 F.K. Gleason	175
Effect of Heterotrophic Growth on the Thioredoxins of Wild Type and γ -1 <i>Chlamydomonas reinhardtii</i> H.C. Huppe, B.B. Buchanan, J.-P. Jacquot	179
Regulation of Pyruvate-Orthophosphate Dikinase from Maize Leaves. Magnesium-Dependent Dimer-Tetramer Interconversion H. Nakamoto	183
Separation and Characterization of Fructose-1,6-Bisphosphatases and Sedoheptulose-1,7-Bisphosphatases from Leaves of <i>Pisum sativum</i> L. D. Nothnagel, J. Hoffstädt, E. Latzko	187
Control of Stromal Fructose 1.6 Bisphosphatase and Sedoheptulose 1.7 Bisphosphatase by Metabolite Levels D. Schimkat, D. Heineke, H.W. Heldt	191
Interaction of Chloroplast Fructose-1.6-Bisphosphatase with Micelles of Triton X-114 G. Prat-Gay, R. Rodríguez-Suarez, R.A. Wolosiuk	195
The <i>in vivo</i> Functioning Forms of Ribulose 1,5-Bisphosphate Carboxylase/Oxygenase in Plants A. Yokota, T. Taira, H. Usuda, S. Kitaoka	199
Structural Analysis of the Triose Phosphate-3-Phosphoglycerate-Phosphate Translocator from Spinach Chloroplasts U.I. Flügge, K. Fischer, A. Gross	203

X

Binding of the Lipophilic Tertiary Amine and 'Selective' Uncoupler Dibucaine to Thylakoid Membranes G. Günther, H. Laasch	207
Localized Proton Domains in pH-Dependent Control of Photosynthetic Electron Transport under the Influence of Lipophilic Tertiary Amines A. Janowitz, G. Günther, H. Laasch	211
Oscillations of Photosynthesis in Intact Isolated Pea Chloroplasts in the Presence of DCMU and Antimycin A S. Veljović, Z.G. Cerović, M. Plesničar	215
Photosynthetic Metabolism in Barley Leaves Infected with Powdery Mildew J. Scholes, P. Lee, P. Horton, D. Lewis	219
The Relationship Between the Development of Haustoria of <i>Erysiphe graminis</i> and the Energy Status of Leaves D.P. Wright, J.D. Scholes, P. Horton, B.C. Baldwin, M.C. Shephard	223
Synthesis of Alanine from 3-Phosphoglycerate by Intact Bundle Sheath Cells of Zea Mays E.M. Valle, H.W. Heldt	227
The Principal Scheme of Photosynthetic Carbon Conversion in Cells of Isoprenoreleasing Plants G.A. Sanadze	231
The Enhancement Effect of Isoprene Evolution by Poplar Leaves D.I. Baazov, G.A. Sanadze	239
Regulation of NADP-Malate Dehydrogenase Light-Activation by the Reducing Power. I. Functional Studies M. Miginiac-Maslow, P. Decottignies, J.-P. Jacquot, P. Gadal	243
Regulation of NADP-Malate Dehydrogenase Light-Activation by the Reducing Power. II. Structural Studies P. Decottignies, J.-M. Schmitterr, M. Miginiac-Maslow, P. Le Maréchal, J.-P. Jacquot, P. Gadal	247
Light Activation of Membrane-Bound Fructose-1.6-Bisphosphatase from Pea Leaf Chloroplasts J.J. Lázaro, A.R. Andrés, A. Chueca, R. Hermoso, J. López Gorgé	251
How Can the C ₄ Stromal System Sense Differences in Light Intensity to Adjust Its Activities to the Overall Flux? H. Usuda	255
The Relationship Between the Efficiencies of Photosystems I and II and the Control of Electron Transport J. Harbinson, B. Genty, C.H. Foyer, N.R. Baker	259
Differential Diurnal Carbon Exchange and Photoinhibition in a psbA Plastid Gene Chronomutant of <i>Brassica napus</i> J. Dekker, R. Burmester	263
Photosynthesis and Chlorophyll Fluorescence Quenching in Aging Leaves of Three Sunflower (<i>Helianthus annuus</i> L.) Genotypes D. Saftić, M. Plesničar	267
Developmental Variation in Aspartate-Family Amino Acid Biosynthesis by Isolated Chloroplasts W.R. Mills, S.F. Capo, S.A. Bergh, C.B. Lassiter	271

Activities of Carbondioxide Fixing Enzymes in Maize Tissue Cultures in Comparison to Young Seedlings A. Kumar, S. Roy, K.-H. Neumann	275
Measurement of Photochemical and Non-Photochemical Quenching: Correction for Turn-over of PS2 During Steady-State Photosynthesis T. Markgraf, J. Berry	279
Regulation of CO ₂ Assimilation During Photoinhibition M. Dujardyn, C.H. Foyer	283
Intermediates, Catalytic Components and Light and Dark Regulation of ALA and Chlorophyll Formation in the Green Alga <i>Scenedesmus</i> D. Dörmemann, V. Brey, K. Kotzabasis, P. Richter, H. Senger	287
 17. Adaptation Mechanisms	
Adaptation of Photosystem Stoichiometry in Oxygen-Evolving Thylakoid Membranes A. Melis	291
Factors Determining Light Response Characteristics of Leaf Photosynthesis I. Terashima, A. Takenaka	299
Physiological Control of Primary Photochemical Energy Conversion in Higher Plants E. Weis, D. Lechtenberg, A. Krieger	307
Trans- Δ^3 -Hexadecenoic Acid, LHC II and Low Temperature Development in Herbaceous Plants N.P.A. Huner, M. Krol, S. Boese, V. Hurry, J.P. Williams, G. Oquist	313
Chromatic Adaptation in <i>Porphyridium cruentum</i> Expressed in the Distribution of Excitation Energy and in the Thylakoid High-Energy Fluorescence Quenching O. Canaani, S. Driesenaar, S. Malkin, E. Gantt	321
The Involvement of LHC 2 Phosphorylation in the Adaptation of Higher Plants to Changing Light Intensities and Some Results on the Regulation of LHC 2 Phosphorylation <i>in vivo</i> H. Dau, O. Canaani	325
Thylakoid Protein Phosphorylation in an Algae with Chlorophyll A/C/Fucoxanthin Light Harvesting Antenna P. Gibbs, J. Biggins	329
Characterisation and Purification of Polypeptides Undergoing Light-Dependent Phosphorylation in the Cyanobacterium <i>Synechococcus</i> 6301 M. Harrison, J.F. Allen	333
Functional Analysis of the Photosynthetic Apparatus in a Chlorophyll-Deficient Mutant of Cowpea D. Habash, B. Genty, N.R. Baker	337
Slow Fluorescence Transients in Photosynthetic Bacteria I. Šetlik, M. Waldburger-Schlapp, R. Bachofen	341
The Influence of Light Intensity on the Organization of the Photosynthetic Apparatus Rhodospseudomonas Palustris Strain AB Y.E. Erokhin, Z.K. Makhneva, I.R. Prokhorenko	345
Effects of Growth Irradiance on the Photosynthetic Apparatus of the Red Alga <i>Porphyridium cruentum</i> F.X. Cunningham, Jr., R.J. Dennenberg, L. Mustardy, P.A. Jursinic, E. Gantt	349

XII

Red Light Enhances Q_A Relative to P_{700} and Phycobilisomes in the Red Alga <i>Porphyridium cruentum</i>	353
F.X. Cunningham, Jr., R.J. Dennenberg, L. Mustardy, P.A. Jursinic, E. Gantt	
Regulation of LHC II mRNA Levels During Photoadaptation in <i>Dunaliella tertiolecta</i> (Chlorophyceae)	357
J. LaRoche, A. Mortain-Bertrand, J. Bennett, P.G. Falkowski	
Fluorescence Responses on Step Changes in Irradiance by Plants from Different Light Habitats	361
G. Johnson, P. Horton, J. Scholes, P. Grime	
The Relationship Between the Relative Quantum Efficiencies of Photosystems in Leaves. Efficiency of PS2 in Relation to Non-Photochemical Fluorescence Quenching	365
B. Genty, J. Harbinson, J.M. Briantais, N.R. Baker	
Adaptation of the Light Harvesting Apparatus to Shade in <i>Silene dioica</i> (L.): Relationship Between PSI and PSII Efficiencies	369
M. McKiernan, B. Genty, N.R. Baker	
Different Amino Acid Exchanges in the D1 Protein Cause Different Degrees of Shade Type Appearance in Herbicide Tolerant <i>Anacystis</i>	373
F. Koenig	
Characterization of the Light Dependent Regulation of the Apparent Quantum Yield of PSI	377
A.M. Rehm, A. Ried	
Alteration in Thylakoid Composition and Structure of <i>Brassica rapa</i> Ssp. <i>Oleifera</i> During Ageing in High and Low Light	381
A. Nurmi	
Changes in Thylakoid Surface Area When Shade Acclimated <i>Helianthus annuus</i> L. Chloroplasts Are Exposed to High P.F.D.	385
W.R. Fagerberg	
Effect of Cold-Hardening on the Quantum Yield of Spinach Leaves	389
K.J. van Wijk, P.R. van Hasselt	
Environmental and Hormonal Dependence of Induction of Crassulacean Acid Metabolism in <i>Mesembryanthemum crystallinum</i>	393
G. Edwards, S.-H. Cheng, C. Chu, M. Ku	
Control of Oxidative Phosphorylation in the Adaptation of <i>Medicago sativa</i> , <i>Phaseolus aureus</i> and <i>Phaseolus vulgaris</i> to Salinity	397
M.S. González, Z.R. Quintanar, M.J. Vázquez, G.R. Velasco	
Salinity and the Regulation of Pyruvate Pi Dikinase	401
D. Moualem-Beno, A. Shomer-Ilan	
Nitrogen Deprivation and the Photosynthetic Apparatus of the Green Alga <i>Chlorella fusca</i>	405
M.H. Rieß, I. Damm, L.H. Grimme	
Gas Exchange, Chlorophyll a Fluorescence, and Metabolite Levels in Leaves of Trifolium Subterraneum During Long-Term Exposure to Elevated CO ₂	409
T. Betsche, F. Morin, F. Cote, F. Gaugain, M. Andre	
Chlorophyllous Calli from <i>Psoralea bituminosa</i> L. – Adaptation to Photomixotrophism	413
J. Diamond, A. Casimiro, M.S. Pais	
Photosynthesis in Flowers of Petunia Hybrida: Low CO ₂ Flow and Coordinated Reduction Between Photosynthetic Systems	417
D. Weiss, A. Shomer-Ilan, A.H. Halevy	

The Reversible Photochemistry of Phycoerythrocyanin S. Siebzehrübl, G. Lipp, R. Fischer, H. Scheer	421
Quantitative Analysis of the Chlorophyll Fluorescence Induction Curve: Facts and Artefacts S. Mauro, R. Lannoye	425
Physiologically Active Products of Chloroplast Components Degradation I.A. Tarchevsky, A.N. Grechkin, S.I. Pankratova, A.U. Yarin, J.E. Andrianova	429
18. CO ₂ Concentration Mechanisms	
Photosynthetic Inorganic Carbon Transport and Accumulation in Macroalgae F. Brechignac	433
Photosynthetic Acclimation to Low Carbon Concentrations in <i>Chlamydomonas reinhardtii</i> G. Samuelsson, K. Palmqvist, Z. Ramazanov, L.-G. Sundblad	441
Proteins Synthesized During Induction of the CO ₂ Concentrating Mechanism in <i>Chlamydomonas reinhardtii</i> J.V. Moroney	449
The Molecular Biology of Carbonic Anhydrase Expression in <i>Chlamydomonas reinhardtii</i> J.R. Coleman	455
Mutations in the 5' Flanking Region of <i>rbcL</i> Inhibit the Growth of <i>Synechococcus</i> PCC7942 in Air-Level of CO ₂ and Alter the Carboxysome Structure D. Friedberg, A. Kaplan, R. Ariel, R. Schwarz, E. Sadovnick, M. Kessel, J. Seijffers	463
Identification of the Genomic Region Which Complements a Temperature-Sensitive High- CO ₂ Requiring Mutant of the Cyanobacterium, <i>Synechococcus</i> PCC7942 E. Suzuki, H. Fukuzawa, T. Abe, S. Miyachi	467
Molecular Analysis of Mutants of <i>Synechocystis</i> PCC6803 Defective in Inorganic Carbon Transport T. Ogawa, J.G.K. Williams, T. Omata	471
Is Carbonic Anhydrase Required for Photosynthesis? C.A. Roeske, J.M. Widholm, W.L. Orgen	475
Carbonic Anhydrase Activity in Barley Leaves After Treatment with Abscisic Acid and Jasmonic Acid L.P. Popova, G.N. Lazova	479
Isolation of Carbonic Anhydrase from the Higher Plant <i>Pisum sativum</i> N. Majeu, J.R. Coleman	485
Membrane-Bound Carbonic Anhydrase Takes Part in CO ₂ Concentration in Algae Cells N.A. Pronina, V.E. Semenenko	489
Chemical Cross-Linking of Periplasmic Carbonic Anhydrase from <i>Chlamydomonas</i> <i>reinhardtii</i> H.D. Husic	493
The Role of Carbonic Anhydrase in Regulating Photosynthetic CO ₂ Fixation in Higher Plants G. Yuzhu, Z. Zhenlin, G. Minliang, W. Zhong	497
Expression of a Cyanobacterial Gene Regulated by CO ₂ Concentration D. Chamot, J.R. Coleman	501
Adaptation of <i>Chlamydomonas reinhardtii</i> High CO ₂ -Requiring Mutants to Limiting CO ₂ M.H. Spalding, K. Suzuki, A.M. Geraghty	505

XIV

A Phosphoglycolate Phosphatase Mutant of <i>Chlamydomonas reinhardtii</i> K. Suzuki, L.F. Marek, M.H. Spalding	509
Selective Inhibition of CO ₂ Transport in a Cyanobacterium G.S. Espie, A.G. Miller, D.T. Canvin	513
CO ₂ Storage and CO ₂ Concentrating in Brown Seaweeds. I. Occurrence and Ultrastructure H. Ryberg, L. Axelsson, S. Carlberg, C. Larsson, J. Uusitalo	517
CO ₂ Storage and CO ₂ Concentrating in Brown Seaweeds. II. Function in Gas Phase J. Uusitalo, L. Axelsson, S. Carlberg, C. Larsson, H. Ryberg	521
CO ₂ Storage and CO ₂ Concentrating in Brown Seaweeds. III. A Tentative Working Model L. Axelsson, S. Carlberg, C. Larsson, H. Ryberg, J. Uusitalo	525
Inducible CO ₂ Concentrating Mechanisms in Green Seaweeds. I. Taxinomical and Physiological Aspects S. Carlberg, L. Axelsson, C. Larsson, H. Ryberg, J. Uusitalo	529
Inducible CO ₂ Concentrating Mechanisms in Green Seaweeds. II. Ecology and Field Observations C. Larsson, L. Axelsson, S. Carlberg, H. Ryberg, J. Uusitalo	533
Substrate Binding to NADP-Malic Enzyme from Maize Leaves as Determined by Intrinsic Fluorescence Quenching C.S. Andreo, F.E. Podesta, A.A. Iglesias	537
The CO ₂ Concentrating Function of C ₄ Photosynthesis R.T. Furbank, C.L.D. Jenkins, M.D. Hatch	541
Regulation of CO ₂ Fixation in the CAM Plant <i>Kalanchoe pinnata</i> (L.) Pers. by Cellular Nitrate T. Balakumar, M. Sivaguru, P. Moorthy, M.R. James, P.R. Anbudurai	545
19. Stress and Photosynthesis	
Effects of Stress on Photosynthesis T.D. Sharkey, F. Loreto, T.L. Vassey	549
Nitrate Reduction in Leaves is Coupled to Net Photosynthesis W.M. Kaiser	557
Analysis of Chill-Induced Depressions of Photosynthesis in Maize N.R. Baker, G.Y. Nie, A. Ortiz-Lopez, D.R. Ort, S.P. Long	565
Spatial and Temporal Heterogeneities of Photosynthesis Detected Through Analysis of Chlorophyll-Fluorescence Images of Leaves K. Raschke, J. Patzke, P.F. Daley, J.A. Berry	573
Structure and Possible Function of Chloroplast Heat-Shock Proteins and the Effect of Cyclic Heat-Shock on Plant Morphogenesis and Circadian Rhythmicity G. Knack, B. Otto, P. Ottersbach, R. Alexander, Z. Liu, K. Kloppstech	579
Carotenoids and Oxidative Stress A.J. Young, G. Britton	587
Analysis of the Mechanisms of Ozone Damage to Photosynthesis <i>in vivo</i> P.K. Farage, S.P. Long, E. Lechner, N.R. Baker	591
The Effect of Ozone on Plant Pigments A. Price, A. Young, P. Beckett, G. Britton, P. Lea	595

Effects of SO ₂ on Photosynthetic Carbon Metabolism in Leaves of Winter Barley (<i>Hordeum vulgare</i> CV. IGRI) P.O. Montiel-Canobra, J.W. Bradbeer, N.M. Darrall	599
Influence of Photosynthetic Capacity, Irradiance and SO ₂ Fumigation on Shoot Growth of Azalea (<i>Rhododendron</i>) Cultivars D.J. Ballantyne	603
Simultaneous Measurements of Chlorophyll Fluorescence and CO ₂ -Gas Exchange on Spruce under Fumigation with Peroxides S. Drenkard, J. Maguhn, A. Ziegler-Jöns, D. Knoppik	607
The Effect of Prolonged Exposure to Air-Borne Pollutants on the Photosynthesis of Douglas Fir (<i>Pseudotsuga menziesii</i>) Studied with <i>in vivo</i> Chlorophyll Fluorescence O. van Kooten, L.W.A. van Hove, W.J. Vredenberg	611
Properties of Selenium-Induced Glutathione Peroxidase in Low-CO ₂ -Grown <i>Chlamydomonas reinhardtii</i> S. Shigeoka, T. Takeda, T. Hanaoka, A. Yokota, S. Kitaoka, Y. Iizuka	615
Molecular Properties of Ascorbate Peroxidase from Tea Leaves G.-X. Chen, K. Asada	619
Recovery of Photosynthesis in Winter Stressed Scots Pine C. Ottander, G. Öquist	623
Chilling-Induced Alterations in the Photosynthetic Capacity of Chilling-Tolerant and Chilling-Sensitive Cultivars of Zea Mays C.S. Ting, T.G. Owens, D.W. Wolfe	627
Photoinhibition and Recovery in Isolated Mesophyll Cells of Hardened and Non-Hardened Rye L. Lapointe, N. Huner	631
Photoinhibition and Recovery of Photosynthesis in Antarctic Bryophytes under Field Conditions A. Post, E. Adamson, H. Adamson	635
Photosynthesis in <i>Grimmia antarctici</i> , An Endemic Antarctic Bryophyte, is Limited by Carbon Dioxide E. Adamson, A. Post, H. Adamson	639
Photosynthetic Characterization of Spinach Developed at Cold Hardening and Non Hardening Temperatures S.R. Boese, N.P.A. Huner	643
Frost Resistance of Wheat and CHL <i>a in vivo</i> Fluorescence Induction Kinetics L. Shiqing, Y. Dianan, Z. Jide, L. Tongzhu, T. Chongqing, L. Shiqing, K. Tingyun	647
Changes of Photosynthetic Membrane and Cell Resistance of a Leaf of Wheat Seedlings During Temperature Acclimation A.A. Filimonov, A.A. Virolainen, E.G. Sherudilo, A.F. Titov	651
Effect of Heat Stress on Intact Wheat Leaves and Its Recovery Studied by Fluorescence Induction Kinetics R.K. Mishra, G.S. Singhal	655
Synthesis of Sucrose and Fructans in Wheat Leaves: The Effects of Temperature C. Paulino, M.C. Arrabaça	659
The Effect of Temperature on Photosynthesis and Amounts and Transport of Assimilate in Sunflower and Rape M.J. Paul, D.W. Lawlor	663

XVI

Effects of Low Temperature on Chlorophyll Protein Complexes and Regulation Capacity of Excitation Energy Distribution in Chloroplast Membrane of Cucumber C.H. Xu, F.H. Zhao, K.B. Wang, D.H. Yang, Y.L. Dai	667
Genetic Variation and Diversity of Low Temperature Induced Damages in Maize Seedlings as Assessed by Chlorophyll Fluorescence Induction Curves M.-F. Scharll, R. Lannoye, S. Mauro	671
The Effects of Low Temperature on Activities of Carbon Metabolism Enzymes in <i>Zea mays</i> L. Seedlings M.R. Hull, S.P. Long, C.R. Raines	675
Chill-Induced Modifications to the Relationship Between Thylakoid Protein Phosphorylation and Energy Distribution of Photosystem 2 in Maize J. Val, N.R. Baker	679
Chilling Stress and Active-Oxygen Enzymes in <i>Zea mays</i> and <i>Zea diploperennis</i> L.S. Jahnke, M.R. Hull, S.P. Long	683
Low Temperature Perturbation of Thylakoid Protein Metabolism During Maize Leaf Development G.Y. Nie, N.R. Baker	687
Perturbation of the Maize Light-Harvesting Apparatus by Chilling D.A. Campbell, D.B. Hayden, L.B. Johnson, N.R. Baker	691
Effects of Fire on Photosynthesis and Transpiration in a Mediterranean Ecosystem I. Fleck, F.J. Iñiguez, C. Diaz, M. Pascual	695
Protective Effect of Putrescine and Spermidine on the Thylakoid Membrane Activity After High Temperature Treatment I.T. Yordanov, V. Goltsev, L. Kruleva	699
Two Sites of Heat-Induced Damage to Photosystem II D.W. Becker, G. Bain, J. Norman, M. Moholt-Siebert	705
Light Regulation of the 22 kd Heat-Shock Protein in <i>Chlamydomonas reinhardtii</i> D. Ish-Shalom, A. Post, K. Kloppstech, I. Ohad	709
Responses of Some Photosynthetic Parameters in C ₃ and C ₄ Crop Plants under Water Deficit M. Castrillo, D. Fernández, A.M. Calcagno, I. Trujillo	713
A Gas Exchange Procedure to Evaluate Non Uniform Stomatal Closure Effects in Single Mesophyte Evergreen Leaves Under High VPD G. Bongi	717
Does Air Relative Humidity During Growth Condition Photosynthetic Characteristics of Coffee Leaf? M.A. Nunes, P.S. Rijo	721
The Effect of Drought on Chlorophyll Fluorescence in Two Maize Lines L. Jovanović, V. Janjić, S. Veljović	725
Drought Effect on Photosynthesis and Plant Production of Two Contrasting <i>Trifolium</i> Cultivars J. Vadell, C. Cabot, H. Medrano	729
Water Stress Effects on Canopy Photosynthesis, Temperature, Transpiration and Shedding of Leaves and Fruit in Cotton A. Ben-Porath, D.N. Baker, A. Marani	733

Water Use Efficiency in Field-Grown Maize: Effects of Soil Structure O. Bethenod, F. Tardieu	737
An Evaluation of the Effect of Salinity of Photosynthesis E. Brugnoli, M. Lauteri	741
Salinity Induced Changes in Leaf Expansion, Photosynthesis and K ⁺ Accumulation in Sunflower J.M. Cheeseman, S. Basu	745
Effect of Environmental Stress on Photosynthesis of Isolated Mesophyll Cells from Cowpea Leaves Z. Plaut, C.M. Grieve, E. Federman	749
Assimilatory Force in Illuminated Leaves Grown in Sun or Shade or Under Mineral Deficiency K. Siebke, K.-J. Dietz, U. Heber	753
Iron Deficiency-Induced Mechanisms of Dissipation of Excess Energy in Higher Plants A. Abadia, F. Morales, J. Abadia	757
Low-Iron Stress in the Cyanobacterium <i>Anabaena variabilis</i> B. Michelsen, M. Miller, R.P. Cox	761
Violaxanthin Cycle and Fluorescence in Iron-Deficient Maize Leaves J. Val, E. Monge	765
Acid Resistance and the CO ₂ – Conductance of the Plasma Membrane of <i>Dunaliella Acidophila</i> C. Weiss, U. Weis, H. Kugel, H. Gimmler	769
The H ⁺ -Export Capacity of <i>Dunaliella acidophila</i> and the Permeability of the Plasma Membrane for H ⁺ and Weak Acids H. Gimmler, M. Bental, H. Degani, M. Avron, U. Pick	773
Variable Fluorescence for Monitoring Algal Activity in a High Rate Photosynthetic Pond B. El Hamouri, R. Moundib, R. Berrada	777
The Effects of Diclofop-Methyl and Methabenzthiazuron on Photosynthetic Parameters in <i>Vicia faba</i> D. Vidal, M.A. Miranda, F. Rodriguez, E. Simon	781
Influence of Environmental Stresses on the Photosynthetic Capacity of S-Triazine Susceptible and Resistant Biotype of <i>Solanum nigrum</i> A. Winterberg, P. Panneels, R. Lannoye	785
Inhibition of Photosynthesis in Barley (<i>Hordeum vulgare</i> L.) Leaves by Phosphinothricin (Glufosinate). Short and Long-Term Effects M. Lacuesta, C. González-Murua, A. Muñoz-Rueda, M. Sivak	789
Effect of the Herbicide SAN 6706 on Pigment Composition in Barley: Measurements Using HPLC R. Juhler, R.P. Cox	793
Changes in Photosynthesis of Wheat Plants Infected by Stem Rust G. Schmittmann, B. Moerschbacher, H.J. Reisener	797
Drought Effect on the Structural and Functional Characteristics of Photosynthetic Apparatus I.A. Tarchevsky, Y.E. Andrianova, N.I. Safina, E.A. Philipova, D.I. Babuzhina	801
Isolation and Characterization of Two Isozymes of Superoxide Dismutase from Scots Pine G. Wingsle, P. Gardeström, J.-E. Hällgren	805

XVIII

An Assessment of Ethylene and Carbon Dioxide Exchange in Plants B. Grodzinski, L. Woodrow	809
Response of Aging Chloroplasts to UV Radiation B. Biswal, G. Kulandaivelu	813
Estimating SO ₂ Stress by Chlorophyll Fluorescence Measurements with an Active System Used in the Remote Sensing Mode C. Kliffen	817
20. Photosynthesis in Nature	
Photosynthesis and Field Environmental Productivity Indices P.S. Nobel	821
Photosynthesis of Plants in Relation to Resource Availability in the Field E.-D. Schulze	827
Damage to Photosynthesis During Chilling and Freezing, and Its Significance to the Photosynthetic Productivity of Field Crops S.P. Long, P.K. Farage, Q. Groome, J.M.N. Macharia, N.R. Baker	835
Some Factors Limiting Photosynthesis in Nature Y.-K. Shen	843
Photosynthetic Capacity to Solve the Carbon Dioxide Problem S. Leu, A. Michaels	851
Water Use Efficiency in Potato: Model and Experimental Test of Crop Photosynthesis O. Bethenod, J.-P. Lhomme, N. Katerji	855
Photosynthetic Characteristics of the Mangrove, <i>Bruguiera parviflora</i> , (Roxb.) Wright & Arn., Under Natural Conditions D.R. Carter, J.M. Cheeseman, B.F. Clough, C. Lovelock, R.G. Sim, J.E. Ong	859
Some Physiological Aspects of <i>Paspalum dilatatum</i> Grown Under Field Conditions J. Marques da Silve, A. Bernardes da Silva, D. Coelho Rebelo, M.C. Arrabaça	863
Immunogold Localization of Ribulose 1,5-Bisphosphate Carboxylase in Amphibious <i>Eleocharis</i> Species in Relation to C ₃ and C ₄ Photosynthesis O. Ueno, M. Samejima	867
Relationships Between Source Leaf Photosynthesis, Export and Grain Filling in Maize J.-L. Prioul, A. Reyss, N. Schwebel-Dugue, A. Lechamy	871
The Dependence of Some Photosynthetic Parameters on the Phosphorus Concentration in a Nutrition Solution and Wheat Genotype S. Zatezalo, Ž. Stanković, M.R. Sarić	875
Influence of Mineral Nutrition on the Content of Photosynthetic Pigments in Various Wheat Cultivars M.R. Sarić, Z. Stanković, B. Krstić, S. Zatezalo	879
Dorsiventrality of the Photosynthetic-Light Response in Naturally Occurring C ₃ Dicots T.A. Day, E.H. DeLucia, W.K. Smith	883
The Effect of Cultivar and Leaf Age on the Content of Photosynthetic Pigments in Wheat Ž. Stanković, M.R. Sarić, B. Krstić, S. Zatezalo	887
Effect on Net Carbon Assimilation and Allocation of Assimilates under Elevated CO ₂ in Mungbean U.K. Sengupta, A. Sharma	891

$\delta^{13}\text{C}$ Analysis to Approach the Mechanism of Varietal Difference of Photosynthetic Rate in Rice Plants H. Sasaki, M. Samejima, R. Ishii	895
A New Open Gas-Flow System Configuration for Measurement of Photosynthetic CO_2 Response Curve L. Nátr, R. Hák, V. Kotvalt	899
Impairment of Chloroplast Development and Sink Strength by Blockade of Light in Chloroembryos of <i>Cyamopsis tetragonoloba</i> (L.) Taub P. Kaladharan, M. Vivekanandan	903
Estimation of the Light Limitation of Photosynthesis H.G. Jones, A. Massacci	907
The Efficiency of Utilization of Photosynthetically Active Radiation and Distribution of Assimilates in Sunflow (<i>Helianthus annuus</i> L.) Z. Sakač, T. Čupina	911
The Relation of Chlorophyll Delayed Fluorescence of Plant with Photosynthesis: Light Dependence V. Morgun, N. Znak, S. Doldjikov	915
Intercepted Irradiance Limits Carbon Assimilation of a Coastal Dune Plant N.W. Pammenter, V.R. Smith	919
Phytoplankton Photosynthesis in the Atlantic Ocean as Measured from a Submersible Pump and Probe Fluorometer <i>in situ</i> P.G. Falkowski, Z. Kolber	923
Comparison of Growth of Micro-Algae <i>Nostoc Linckia</i> & <i>Chlorella</i> sp. in Dilute Culture N. Sen	927
Effects of Suboptimal Temperature and Light Conditions During Growth on Temperature Dependent Chlorophyll Fluorescence of Tomato L.H.J. Janssen, P.R. van Hasselt	931
Phototrophic Bacteria that form Heat Resistant Endospores J. Ormerod, T. Nesbakken, Y. Torgersen	935
Index of Names	939

THE REVERSIBLE PHOTOCHEMISTRY OF PHYCOERYTHROCYANIN

SIEBZEHRÜBL, S., LIPP, G., FISCHER, R., SCHEER, H. Botanisches Institut der Universität, Menzinger Str. 67, D-8000 MÜNCHEN 19, FRG

1. INTRODUCTION

Plant and algal biliproteins have two major functions: The phycobiliproteins are light-harvesting pigments for photosynthesis (1); the phytochromes are the photoreceptors of plant photomorphogenesis. Many cyanobacteria also show responses suggesting photoreversibly photochromic pigments as photoreceptors (see 2,3,4,5). The putative pigments have been termed adaptochromes and phycomorphochromes. Isolation attempts (review in 2) resulted in the spectral characterization of at least four different fractions termed phycochromes a-d; but in no case has there been conclusive evidence, that these are the putative photoreceptors.

The absorption spectra of all phycochromes suggest that they are biliproteins, too. These pigments may then combine both functions of light harvesting and photomorphogenesis induction in one molecule. Phycochrome b has indeed been shown to be most likely the α -subunit of the antenna pigment phycoerythrocyanin (PEC) (6). PEC is present in several species of cyanobacteria (7). It carries an unusual phycoviolobilin chromophore on its α -subunit (Fig. 1) (8), which is responsible for its photochromic response. Here we want to give further (9) results on the photochemistry of PEC from two cyanobacteria, e.g. *Mastigocladus (M.) laminosus* and *Chroococciopsis (Ch.) spec.*. We have characterized the photochemistry of the pigment in different states of aggregation, and the mutual interdependence of its phototransformation and aggregation.

2. MATERIALS AND METHODS

Phycoerythrocyanin (PEC) of *M. laminosus* and *Ch. spec.* were prepared by the method of Füglistaller et al. (10). The subunits of PEC were obtained by isoelectric focusing (11) under anaerobic conditions. Absorption and absorption difference spectra were measured in split beam mode with thermostated cell holders. Irradiation was done in the photometer (150 W, light guide and suitable interference filters). The aggregation state of PEC was studied by sucrose-density gradient centrifugation at 238,000 \times g (12). In the reactions relating irradiation with aggregation, a PEC (*M. laminosus*) stock solution (A 570 = 0.6 cm^{-1}) was irradiated alternately with green and orange light. Before the first and after each subsequent illumination an aliquot (0.2 ml) was applied to the sucrose gradient (5 ml, 7 to 17 % w/w).

3. RESULTS AND DISCUSSION

3.1. Characterization of photochemistry

When PEC or its α -subunit isolated from the blue-green algae *M. laminosus* or *Ch. spec.* were irradiated either with orange (600 nm; 575

nm for *Ch. spec.*- α -subunit) or green light (500 nm), a typical photochemistry was observed. Irradiation with orange light leads to an absorption difference spectrum with a maximum at 502-504 nm and a negative extremum at 565-570 nm. Illuminating the sample with green light reverts the spectrum fully to the original. The amplitudes of the difference spectra are strongly dependent on the state of the pigment (Table 1). It is maximum in the presence of 4 M urea, whereas it is lower in the fully denatured pigment (8 M urea) and very small in high aggregates and phycobilisomes. Upon addition of increasing amounts of urea, the difference extrema of the reversible reaction remain stationary up to denaturant concentrations of 4 M (Table 1). At the same time, the amplitudes increase. At higher urea concentrations, the amplitudes decrease again, and the extrema shift gradually to 510 and 600 nm. Reversible photochemistry is retained up to 8 M urea, when the polypeptide chains are fully unfolded. The photochemistry is very similar in PEC isolated from the two different organisms, e.g. *M. laminosus* and *Ch. spec.*. Reversible photochemistry is also retained in denatured PEC at low pH.

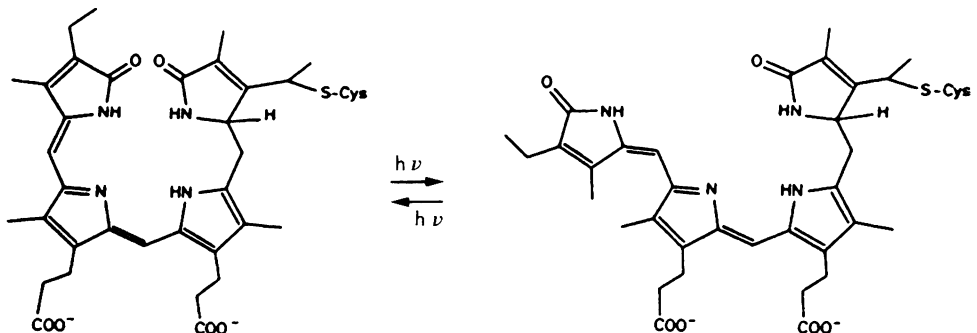


Fig. 1: Structures of phycoviolobilin chromophores in their 10Z,15Z (left) and 10Z,15E-configuration (right). Schematic, native chromophores have extended geometries.

The β -subunit of PEC shows no reversible photochemical effects. However the two phycocyanobilin chromophors of this subunit are very sensitive against irradiation, and bleach rapidly to colorless product(s) (viz. by 60 - 70 % within 12 min). This rapid bleaching contrasts with the relative stability of the phycocyanin β -subunit (11).

The reversible photochemistry of PEC and its α -subunit is probably related to a Z=E isomerisation of the phycoviolobilin chromophore (Fig.1). Of the different chromophore types of phycobiliproteins, it is the only one which shows a reversible photochemistry in its native and denatured state. We suggest that isomerization takes place in the α -subunit of PEC at the $\Delta 15$ -double bond, similar to the phytochrome primary reaction.

3.2. Interrelations of photochemistry and aggregation

Aggregation not only strongly influences the photochemical activity of PEC (Table 1), but the inverse is also true, e.g. pre-irradiation

Table 1 : Absorption difference extrema and amplitudes of different PEC samples or samples subjected to different pre-treatments.

Sample	C ^{a)} buffer [mM]	C ^{a)} urea [M]	pH	Difference extrema [nm]		$\Delta\Delta$ ^{b)} [%]
				orange	green	
PEC	100	0	7.0	570	503	18
PEC	100	1	7.1	569	503	32
PEC	100	4	7.3	567	502	35
PEC	100	6	7.5	600	510	12
PEC	100	8	7.0	599	515	6
PEC	100	8	3.0	598	507	13
PEC-monomer	100	c)	7.0	565	504	36
α -Subunit	100	0	7.0	569	504	50

a) Buffer - potassium phosphate buffer.

b) Amplitude (Min-max) of difference spectra.

c) 1 M KSCN, no urea.

Table 2 : Comparison of photochemistry of PEC between *Mastigocladus laminosus* and *Chroococcidiopsis spec.*

Pigment	<i>Mastigocladus laminosus</i>	<i>Chroococcidiopsis spec.</i>
native Pigment^{a)}		
λ	573	574
Δ_{max}^{max}	(+) 503 / (-) 570 ^{b)}	(+) 507 / (-) 576 ^{b)}
$\Delta\Delta$ [%]	18 %	26 %
denatured Pigment^{c)}		
λ	603 / 661 ^{e)}	604 / 661 ^{e)}
Δ_{max}^{max}	(+) 507 / (-) 598 ^{b)}	(+) 506 / (-) 597 ^{b)}
$\Delta\Delta$ [%]	13 %	10.4 %
denatured Pigment^{d)}		
λ	587	597
Δ_{max}^{max}	(+) 515 / (-) 600 ^{b)}	(+) 507 / (-) 595 ^{b)}
$\Delta\Delta$ [%]	6 %	2.4 %
α-Subunit (native)^{a)}		
λ	562	561
Δ_{max}^{max}	(+) 504 / (-) 569 ^{b)}	(+) 501 / (-) 563 ^{b)}
$\Delta\Delta$ [%]	50 %	15 %

a) Green irradiated form in 100 mM phosphate buffer, pH 7.

b) Difference extrema (orange irradiated vs. green irradiated sample), (+) - positive, (-) - negative.

c) Green irradiated form in 8 M urea, 100 mM phosphate buffer acidified with HCl to pH 2.

d) Green irradiated form in 8 M urea + 100 mM phosphate buffer, pH 7.4.

e) Double maximum in the acidified state.

with different light qualities influences the aggregation of PEC (9). A sample of PEC was irradiated alternately with orange and green light. Aliquots of the original sample were then analyzed for aggregate distribution by ultracentrifugation. In every case, the sample is a mixture of mono- and trimeric PEC, but the amount of higher aggregates is always increased after irradiation with green light, and decreased after irradiation with orange light. A reversible dissociation as response to different light qualities would principally offer indirect routes for signal transduction, since a direct effect of the phycobili-proteins may be questioned on the basis of the small size of the PEC molecule primarily(?) optimized for light-harvesting.

An indirect route could be based on e.g. photodynamic effects of free biliproteins (13) or the release of linker peptides (14-16).

Acknowledgement: This work was supported by the Deutsche Forschungsgemeinschaft, Bonn (SFB 143).

REFERENCES

- 1 MacColl, R. and Guard-Friar, D. (1987) *Phycobiliproteins*, CRC Press, Boca Raton
- 2 Björn, L. O. and Björn, G. S. (1980) *Photochem. Photobiol.* 32, 849-852
- 3 Bogorad, L. (1975) *Ann. Rev. Plant. Physiol.* 26, 369-401
- 4 Scheer, H. (1987) in *Progress in Photosynthesis Research* (Biggins, J., ed.), Vol. I, pp. 143-149, Martinus Nijhoff Publishers
- 5 Tandeau de Marsac, N. (1983) *Bull. Inst. Pasteur* 81, 201-254
- 6 Kufer, W. and Björn, G.S. (1989) *Physiol. Plant.* 75, 389-394
- 7 Bryant, D.A. (1982) *J. Gen. Microbiol.* 128, 835-844
- 8 Bishop, J. E., Rapoport, H., Klotz, A. V., Chan, C. F., Glazer, A. N., Füglistaller, P. and Zuber, H. (1987) *J. Am. Chem. Soc.* 109, 875-881
- 9 Siebzehnrübl, S., Fischer, R., Kufer, W. and Scheer H. (1989) *Photochem. Photobiol.* 49, 753-761
- 10 Füglistaller, P., Widmer, H., Sidler, W., Frank, G. and Zuber H. (1981) *Arch. Microbiol.* 129, 268-274
- 11 Schmidt, G., Siebzehnrübl, S., Fischer, R. and Scheer, H. (1988) in *Photosynthetic Light-Harvesting Systems. Organization and Function* (Scheer, H. and Schneider, S., eds.), pp. 77-88, W. deGruyter, Berlin
- 12 Martin, R.G. and Ames, B.N. (1961) *J. Biol. Chem.* 236, 1372-1379
- 13 Morcos, N. C., Berns, M. and Henry, W. L. (1988) *Lasers Surg. Med.* 8, 10-17
- 14 Bryant, D.A. (1988) in *Photosynthetic Light-Harvesting Systems. Organization and Function* (Scheer, H. and Schneider, S., eds.), pp. 217-232, W. DeGruyter, Berlin
- 15 Glazer, A.N. (1985) *Ann. Rev. Biophys.* 14, 47-77
- 16 Rümbeili, R. and Zuber, H. (1988) in *Photosynthetic Light-Harvesting Systems* (Scheer, H. and Schneider, S., eds.), pp. 61-70, W. deGruyter, Berlin

Index of Names

- Aartsma, T.J., II.4.161, II.4.185
 Aasa, R., I.3.777
 Abad, M.S., II.5.231, III.13.731
 Abadia, A., IV.19.757
 Abadia, J., IV.19.757
 Abdin, M.Z., IV.15.67
 Abe, T., IV.18.467
 Abramchik, L.M., III.13.819
 Abresch, E., I.1.77,
 Abrol, Y.P., I.3.941, III.12.597, IV.15.67
 Abu-Much, E., III.9.193
 Abuja, P.M., III.11.373
 Adamson, E., IV.19.635, IV.19.639
 Adamson, H., III.13.687, IV.19.635,
 IV.19.639
 Adir, N., II.6.409
 Ajlani, G., I.2.543, II.6.427
 Åkerlund, H.-E., I.3.897, I.3.901
 Albertsson, P.-Å., II.5.301, II.8.831, II.8.835,
 II.8.839, II.8.843, II.8.923,
 Albrecht, A.C., II.5.289, II.5.293
 Alexander, R., IV.19.579
 Allakhverdiev, S.I., I.2.379,
 Alldrick, S., III.13.671
 Allen, J.F., II.4.81, II.8.915, II.8.919,
 IV.17.333
 Allen, J.P., I.1.61,
 Allen, Jr., L.H., III.11.399
 Allen, K.D., II.5.269, II.8.903
 Allakhverdiev, S.I., I.2.247
 Althoff, G., III.9.81, III.9.133
 Amesz, J., II.4.25, II.4.145, II.4.161,
 II.4.185, II.4.189
 Amla, D.V., IV.16.143
 Amory, A.M., II.6.443, IV.15.71, IV.15.75
 Ampe, F., III.12.521
 Anandan, S., II.5.285
 Ananyev, G., I.2.247
 Anbudurai, P.R., III.13.699, IV.18.545
 Andersen, B., II.7.523, II.7.671, II.7.679,
 III.12.613
 Anderson, J.M., II.8.803, II.8.935
 Andersson, B., I.2.299, II.5.253, II.5.265,
 II.5.273, II.6.349, II.6.423, II.7.583,
 II.8.763, II.8.799, III.9.201
 Andersson, P.-O., II.4.11, II.4.117
 Andre, M., II.6.511, IV.17.409
 Andreasson, E., II.8.831, II.8.839, II.8.843,
 II.8.923
 Andréasson, L.-E., I.2.527, I.3.785,
 III.10.319
 Andreo, C.S., IV.18.537
 Andrés, A.R., IV.16.251
 Andrews, T.J., III.11.331
 Andrianambinintsoa, S., I.2.463
 Andrianova, J.E., IV.17.429, IV.19.801
 Andriesse, X., III.12.533
 Angerhofer, A., I.1.109, I.1.145
 Apley, E., III.9.81
 Apley, E.C., III.9.53, III.9.81, III.9.93
 Arata, H., III.10.315
 Argyroudi-Akoyunoglou, J.H., III.13.803
 Ariel, R., IV.18.463
 Armitage, J.P., IV.15.51
 Aro, E.-M., II.6.439, II.6.459
 Arrabaça, M.C., IV.19.659, IV.20.863
 Asada, K., I.2.491, I.2.495, I.3.889,
 IV.19.619
 Astier, C., I.2.543
 Aula Dei, E.E., II.8.907
 Aumeier, W., I.1.133, I.1.153
 Avelange, M.H., IV.15.83
 Avital, S., III.9.45
 Avron, M., IV.19.773
 Axelsson, L., IV.18.517, IV.18.521,
 IV.18.525, IV.18.529, IV.18.533
 Azcon-Bieto, J., IV.15.39

 Baake, E., I.2.567
 Baazov, D.I., IV.16.239
 Babcock, G.T., I.2.239, I.2.263, I.2.483,
 I.2.539, I.2.643, III.12.499
 Babuzhina, D.I., IV.19.801
 Bachofen, R., II.4.77, IV.17.341
 Bader, K.P., I.3.861, I.3.865
 Badger, M.R., III.11.331
 Baggoo, A.K., III.13.695
 Bagley, K.A., I.1.77, I.1.81
 Bahnsen, K., III.14.885
 Bain, G., IV.19.705
 Baker, D.N., IV.19.733
 Baker, N.R., II.6.463, IV.16.259, IV.17.337,
 IV.17.365, IV.17.369, IV.19.565,
 IV.19.591, IV.19.679, IV.19.687,
 IV.19.691, IV.20.835
 Bakker, H., III.12.533

- Balakumar, T., III.13.699, IV.18.545
 Balangé, A.P., III.14.873
 Baldwin, B.C., IV.16.223
 Ballantyne, D.J., IV.19.603
 Baltscheffsky, H., II.8.763, III.9.197,
 III.9.201,
 Baltschaffsky, M., II.8.763, III.9.197,
 III.9.205
 Bansal, K.C., I.3.941, III.12.597
 Bao, J.-S., III.11.347
 Bar-Zvi, D., III.9.193
 Barbato, R., I.2.339, II.6.419
 Barber, J., I.2.223, I.2.279, I.2.307, I.2.327,
 I.2.415, I.2.419, I.2.431, I.2.435, I.2.455,
 I.2.611, II.6.415, II.6.515, II.6.519,
 II.8.715, III.12.617, III.12.637
 Barends, J.P.F., I.3.693
 Barillot, E., I.2.463
 Barón, M., I.2.303
 Barry, B.A., I.2.239, I.2.483
 Bartling, D., II.5.253
 Bass, W.J., II.4.73,
 Bassi, R., II.5.209, II.5.249
 Basu, S., IV.19.745
 Baumgart, F., I.3.749,
 Baumgarten, M., I.3.953
 Baumgartner, B.J., III.12.423
 Baur, P., II.8.827
 Bauscher, M., I.1.77, I.1.81, I.1.85
 Bayburt, T.H., I.3.821
 Beachy, R.N., I.2.323
 Béal, D., II.8.879
 Beatty, J.T., III.12.453
 Beauregard, M., I.2.331
 Bechtel, C., I.2.355
 Beck, W.F., I.3.721, I.3.817
 Becker, D.W., IV.19.705
 Becker, M., I.1.101, I.1.121
 Beckett, P., IV.19.595
 Bednárová, L., II.8.821
 Beer, S., III.11.411
 Beinsberger, S., III.13.775
 Ben-Porath, A., IV.19.733
 Bender, C., I.3.709,
 Bennett, A., II.5.269
 Bennett, J., II.8.747, IV.17.357
 Bennoun, P., III.12.437
 Bental, M., IV.19.773
 Berg, S.P., I.2.671
 Berger, G., I.1.89, I.2.463, III. 9.65
 Bergh, S.A., IV.16.271
 Bergström, H., II.4.153, II.4.173
 Berliner, M.A., I.2.569,
 Bernardes da Silva, A., IV.20.863
 Bernarding, J., II.6.373
 Bernier, F., I.3.945
 Berrada, R., IV.19.777
 Berry, J.A., IV.16.279, IV.19.573
 Bertrand, M., III.13.787
 Berzborn, R.J., III.9.57, III. 9.61
 Bethenod, O., IV.19.737, IV.20.855
 Betsche, T., II.6.511, IV.17.409
 Betts, S.D., I.2.267, I.3.797
 Betzel, Ch., II.7.547
 Beuttenmüller, M., III.11.381
 Bhattacharjee, R.C., III.13.695
 Biaudet, P., III.9.141
 Bickel-Sandkötter, S., III.9.77
 Biggins, J., II.7.639, IV.17.329
 Bingsmark, S., II.8.763, II.8.799
 Biro, A.J., III.13.695
 Bishop, N.I., I.2.507, I.3.929
 Biswal, B., IV.19.813
 Biswal, U.C., I.2.651
 Bittersmann, E., I.2.667, II.4.165, II.4.169,
 II.5.297, II.7.611
 Bixon, M., I.1.11,
 Bizouam, T., III.9.153
 Blackwell, R.D., IV.15.15
 Blankenship, R.E., I.1.121, II.4.17, II.4.37,
 II.4.169
 Blättler, R., III.13.791
 Blondel, J.D., III.14.873
 Blubaugh, D.J., I.2.503
 Blumenstein, S., III.9.193
 Bock, C.H., II.7.619, II.7.623
 Böddi, B., III.14.835
 Boekema, E.J., I.2.267, I.2.375, III.9.33
 Boese, S.R., IV.17.313, IV.19.643
 Bogatyrenko, V.R., I.2.379,
 Bogdanoff, P., III.9.217
 Bogdanović, M., III.13.683
 Böger, P., IV.15.95
 Bogorad, L., III.12.557
 Bolhar-Nordenkamp, H.R., IV.15.31
 Bonadies, J.A., I.3.709,
 Bongi, G., IV.19.717
 Bönigk, B., I.1.141
 Booth, P.J., I.2.455, I.2.611, II.6.519
 Borchard, A., III.9.97
 Boschetti, A., I.2.315, II.5.257, III.13.791
 Böttcher, B., III. 9.33
 Bottin, H., II.7.539, II.7.631
 Boucher, N., III.10.295

- Boussac, A., I.3.713
 Bowden, S.J., I.2.603, I.2.411, I.2.519,
 I.2.551, I.3.717
 Bowes, G., III.11.399
 Bowlby, N.R., I.2.539, I.2.239, I.2.263,
 I.2.643, I.3.797
 Bowyer, J., I.2.603, III.12.561, III.13.759,
 Boxer, S.G., I.1.113, III.12.529
 Boynton, J.E., III.12.509
 Bradbeer, J.W., III.12.601, IV.16.147,
 IV.16.151, IV.16.155, IV.19.599
 Brand, J.J., II.6.401
 Brändén, R., III.11.351, III.11.371
 Brandt, P., III.13.783
 Brechignac, F., IV.18.433
 Breidenbach, E., III.13.791
 Brentel, I., III.14.843
 Breton, A.M., III.12.521
 Breton, J., I.1.77, I.1.81, I.1.85, I.1.89,
 I.2.463, I.2.467, II.4.125, II.5.305,
 II.5.329, II.7.599
 Brettel, K., I.2.447, I.3.837, II.7.539,
 II.7.623, II.7.627
 Breu, V., III.13.807, IV.16.287
 Briantais, J.M., IV.17.365
 Bricker, T.M., I.2.639, I.3.825
 Britt, R.D., I.3.769,
 Britton, G., II.4.53, III.14.827, IV.15.15,
 IV.19.587, IV.19.595
 Brodt, C.A., IV.15.87
 Brown, R.G., II.7.615
 Brown, S., IV.15.51
 Brudvig, G.W., I.3.721, I.3.817
 Brugnoli, E., IV.19.741
 Brune, D.C., II.4.17, II.4.37
 Brunisholz, R.A., II.4.61
 Bryant, D.A., II.4.1
 Buchanan, B.B., IV.16.179
 Büchel, C., II.8.943
 Buchholz, C., III.12.621
 Budde, R.J.A., IV.16.135
 Buetow, D.E., III.12.549
 Bukhov, N.G., I.2.559,
 Bull, A.D., III.13.807
 Bulté, L., III.13.715, IV.15.43
 Burmester, R., IV.16.263
 Burnap, R., I.2.255
 Bustos, S.A., II.8.863, III.12.445
 Buurmeijer, W.F., II.8.891
 Buvinger, M.E., II.8.747
 Bylina, E.J., I.1.53, I.1.109, I.1.149
 Cabot, C., IV.19.729
 Cai, X., III.13.739
 Calcagno, A.M., IV.19.713
 Calie, P.J., III.12.475
 Callahan, F.E., II.8.733
 Camilleri, P., I.2.603
 Camm, E.L., I.2.659,
 Cammarata, K., II.5.341
 Campbell, D.A., IV.19.691
 Canaani, O., IV.17.321, IV.17.325
 Canvin, D.T., IV.18.513
 Cao, J., I.2.515
 Capo, S.F., IV.16.271
 Capuano, V., II.4.101
 Carlberg, S., IV.18.517, IV.18.521,
 IV.18.525, IV.18.529, IV.18.533
 Carlson, T.J., III.12.525
 Carmeli, C., III.9.29
 Carnot, L., III.12.437
 Carpenter, S.D., I.2.359
 Carpentier, R., I.2.343, I.2.595, II.7.691,
 III.10.295
 Carrasco, J.L., IV.16.163
 Carrillo, N., III.14.865
 Carter, D.R., IV.20.859
 Cashmore, A.R., III.13.779
 Casimiro, A., IV.17.413
 Castrillo, M., IV.19.713
 Causgrove, T.P., II.4.17, II.4.37, II.5.325
 Cerović, Z.G., I.2.607, IV.16.215
 Chaika, M.T., III.13.819
 Chaloub, R.M., II.8.847
 Chamot, D., IV.18.501
 Chan, R.L., II.8.871
 Chang, M.C., II.4.65, II.4.73, II.4.133
 Chao, S., III.12.601
 Chapados, C., I.2.343
 Chapman, D.J., I.2.223, I.2.327, II.6.515
 Charité, J., I.2.231, I.2.359
 Chaturvedi, R., II.6.393
 Cheeseman, J.M., IV.19.745, IV.20.859
 Chen, G.-X., I.2.491, IV.19.619
 Chen, H.-B., III.11.347
 Chen, H.-Q., III.12.549
 Chen, Y., III.10.287
 Cheng, S.-H., IV.17.393
 Cheniae, G.M., I.2.503, I.3.721
 Chirino, A., I.1.61
 Chittock, R., II.7.615
 Cho, D.-S.C., III.12.445
 Chollet, R., IV.16.135
 Chong, C.L., II.5.281

- Chongqing, T., IV.19.647
 Choquet, Y., III.12.437
 Chow, W.S., II.8.935
 Christopher, D.A., III.12.491
 Chu, C., IV.17.393
 Chu, Z.-T., I.1.31,
 Chueca, A., I.2.303, IV.16.163, IV.16.251
 Chyaen, K., II.8.927
 Chylla, R.A., I.2.383
 Clark, S.E., II.5.231, III.13.731
 Clarkson, J., II.8.787
 Cleland, R.E., II.6.507
 Clément-Métral, J.D., III.12.521
 Clijsters, H., III.13.775
 Clough, B.F., IV.20.859
 Cmiel, E., III.13.691
 Cobb, A.H., II.6.451, II.6.455
 Coelho Rebelo, D., IV.20.863
 Cogdell, R.J., II.4.11, II.4.61, II.4.117,
 II.4.121, II.4.137
 Coleman, J.R., III.12.581, IV.18.455,
 IV.18.485, IV.18.501
 Coleman, W.J., I.1.137, I.1.149, I.1.153
 Connor, A.E., II.4.53,
 Conrads-Strauch, J., III.12.605
 Conway, A.B., I.3.829,
 Cook, K.M., III.12.617
 Cook, W., III.12.589
 Copertino, D.W., III.12.491
 Corrie, A.R., I.2.523, I.2.551, I.3.793
 Cote, F., IV.17.409
 Côté, R., IV.15.79
 Cotton, T.M., II.8.907
 Coughlan, S.J., II.7.667
 Cox, A., II.4.81,
 Cox, R.P., II.4.181, IV.19.761, IV.19.793
 Cramer, S.P., I.3.685
 Cramer, W.A., III.10.221, III.10.255,
 III.10.271, III.13.799
 Creighton, S., I.1.31,
 Cresswell, C.F., II.6.443, IV.15.71, IV.15.75
 Critchley, C., II.8.899
 Crofts, A.R., I.2.547, II.6.381, III.9.89,
 III.10.263, III.10.283, III.10.287,
 III.10.291
 Crofts, J., I.2.391
 Cronshagen, U., III.14.869
 Crystall, B., I.2.455, I.2.611, II.6.519
 Cunningham, Jr., F.X., IV.17.349, IV.17.353
 Cupina, T., IV.20.911
 Curtiss, A., III.10.307
 Czernuszewicz, R., I.3.773
 Dahlin, C., II.8.813
 Dai, Y.-L., II.5.281, IV.19.667
 Dainese, P., II.5.209, II.5.249, II.6.419
 Daldal, F., III.10.231
 Daley, P.F., IV.19.573
 Damm, I., II.7.607, II.8.855, IV.17.405
 Darrall, N.M., IV.19.599
 Dau, H., IV.17.325
 Dauter, Z., II.7.547
 Davies, T.G.E., III.13.747
 Davis, D.J., III.10.303
 Day, T.A., IV.20.883
 De Ciechi, P., I.2.363
 De Kouchkovsky, Y., III.9.153
 De Lamotte, F., IV.16.159
 De Lorimer, R., II.4.1
 De Paula, J.C., I.2.239, I.2.643
 Deák, Z., I.3.809,
 Debus, R.J., I.2.239, I.2.483, I.3.829,
 III.12.499
 Decottignies, P., IV.16.159, IV.16.243,
 IV.16.247
 Degani, H., IV.19.773
 Deinum, G., II.4.161
 Dekker, J.P., I.2.239, I.2.263, I.2.267,
 I.2.643, IV.16.263
 Delgado, E., IV.15.39
 Delrieu, M.J., I.3.833
 Delucia, E.H., IV.20.883
 Demeter, S., I.3.809,
 Demetriou, C., I.2.411, I.2.519, I.2.551,
 I.3.717
 Demmig-Adams, B., II.6.357
 Dennenberg, R.J., IV.17.349, IV.17.353
 DePamphilis, C.W., III.12.475
 Depka, B., I.2.217
 Deprez, J., II.5.305, II.5.329
 Derose, V.J., I.3.769, I.3.789
 Dexheimer, S.L., I.3.761
 Di Paolo, M.L., II.5.249
 Diamond, J., IV.17.413
 Dian, J., II.4.205
 Dianan, Y., IV.19.647
 Diaz, C., IV.19.695
 Dibbayawan, T., II.5.333
 Dietz, K.-J., IV.19.753
 Dikanov, S.A., I.2.487
 Dimagno, T., I.1.109,
 Diner, B., III.12.561
 Diner, B.A., I.2.259, I.2.471
 Ding, H.G., II.8.817
 Dismukes, G.C., I.3.773, I.3.953

- Dobek, A., II.5.329
 Doi, M., III.14.853
 Dolan, E., I.3.781
 Doldjikov, S., IV.20.915
 Donner, A., I.2.591
 Dörmemann, D., IV.16.287
 Downie, S.R., III.12.475
 Drachev, A.L. I.1.185
 Dracheva, S.M., I.1.185
 Drager, R.G., III.12.491
 Drake, A., I.2.431
 Drenkard, S., IV.19.607
 Drews, G., II.4.121
 Driesenaar, S., IV.17.321
 Dubbs, J.M., II.4.1
 Ducamp, M., II.6.511
 Ducruet, J.-M., I.2.543
 Dujardin, E., I.3.921, III.13.787
 Dujardyn, M., II.6.491, IV.16.283
 Dumont, N., III.14.849
 Dupree, P., III.12.625
 Durell, S., III.10.311
 Durrant, J.R., I.2.415, II.6.519
 Dutton, P.L., I.1.157
 Dyer, T.A., III.12.461, III.12.601
- Eaton-Rye, J.J., I.3.937
 Eberl, U., I.1.133, I.1.153
 Eckert, H.-J., II.6.373
 Edelman, M., I.2.209, II.8.733
 Edmondson, D.L., III.11.331
 Edwards, G., IV.17.393
 Eggenberger, A.L., I.2.363
 Eggers, B., I.2.231, I.2.359
 Ehara, T., III.12.629
 Ehrenberg, A., II.6.349
 Eichelmann, H., I.2.663
 Eicher, S., II.4.77,
 Eilenberg, H., III.11.411
 Eilers, R.J., I.2.599
 Eisenberg, Y., III.12.641
 El Deeb, M., I.2.239,
 El Hamouri, B., IV.19.777
 El-Deeb, M., I.2.483
 El-Shintinawy, F., I.2.511
 Elanskaya, I.V., III.12.645
 Elderfield, P., III.13.665
 Elich, T.D., II.8.733
 Ellis, R.J., III.13.671
 Enami, I., I.2.319,
 Erdős, G., III.12.549
 Erokhin, Yu.E., II.4.81, IV.17.345
- Espie, G.S., IV.18.513
 Esteban, A., II.4.93,
 Etienne, A.-L., I.2.543, II.6.427
 Evans, E.H., II.7.615
 Evans, M.B., II.4.61,
 Evans, M.C.W., I.1.189, I.2.523, I.2.551,
 I.2.619, I.3.793, II.7.615, II.8.919
 Evelo, R.G., I.2.487
- Fagerberg, W.R., IV.17.385
 Fajer, J., II.4.149
 Falbel, T.G., II.5.269
 Falk, G., III.9.189
 Falkowski, P.G., IV.17.357, IV.20.923
 Fan, L., I.1.205
 Farage, P.K., IV.19.591, IV.20.835
 Farchaus, J.W., I.1.161, I.1.197, I.1.201
 Federman, E., IV.19.749
 Feezel, L.L., I.1.181
 Feher, G., I.1.39, I.1.61, I.1.77, I.1.81,
 I.1.141, I.1.161
 Feick, R., I.1.133, I.1.137
 Fenton, J.M., II.6.381
 Ferguson, L., II.4.117
 Fernández, D., IV.19.713
 Filimonov, A.A., IV.19.651
 Philippova, L., IV.15.103
 Fillat, M.F., II.7.663
 Findlay, J.B.C., II.8.767
 Fine, P.L., I.3.905
 Finke, W., III.9.57
 Finkele, U., I.1.27,
 Fischer, K., IV.16.203
 Fischer, M.R., I.1.177, II.4.45, II.7.711,
 IV.17.421
 Fleck, I., IV.19.695
 Flügge, U.I., IV.16.203
 Ford, L., IV.15.71
 Forti, G., II.8.775
 Fotinou, C., I.2.275
 Foyer, C.H., II.6.483, II.6.491, IV.16.259,
 IV.16.283
 Fragata, M., I.3.945
 Frame, M., III.10.303
 France, L.L., I.2.467
 Franck, F., I.3.921, III.13.751, III.13.755,
 III.13.787
 Frank, G., II.4.61, II.4.89, II.4.93, II.7.591
 Frank, H.A., I.1.105, II.7.639
 Frankel, L.K., I.2.639, I.3.825
 Franzén, L.-G., II.7.591, III.12.437
 Frasch, W.D., I.3.725, I.3.781, I.3.905,

- III.9.9**
 Freiberg, A., **II.4.157**
 Friedberg, D., **IV.18.463**
 Friesner, R.A., **I.1.93**
 Fromme, P., **III.9.15**
 Fronko, R.M., **I.3.797**
 Füglistaller, P., **II.4.93**
 Fujii, T., **II.7.655**
 Fujimura, Y., **I.2.403, I.3.957**
 Fujita, S., **III.13.763**
 Fukuzawa, H., **IV.18.467**
 Furbacher, P.N., **III.10.221, III.10.271, III.13.799**
 Furbank, R.T., **IV.18.541**
- Gaba, V., **I.2.209,**
 Gabai, C., **III.13.823**
 Gad'on, N., **II.4.121**
 Gadal, P., **IV.16.243, IV.16.247**
 Gal, A., **II.8.779, II.8.783**
 Gale, J., **IV.15.55**
 Gale, M.D., **III.12.601**
 Galmiche, J.-M., **III.9.65**
 Gamble, P.E., **III.12.423**
 Ganago, A.O., **I.1.117**
 Gans, P., **IV.15.43**
 Gantt, E., **IV.17.321, IV.17.349, IV.17.353**
 Garab, G., **II.7.667**
 Garbisu, C., **II.7.699**
 Garcia-Véscovi, E., **II.8.895**
 Gardeström, P., **IV.15.9, IV.15.59, IV.19.805**
 Gardet-Salvi, L., **IV.16.167**
 Garlaschi, F.M., **II.5.313, II.5.317**
 Garnier, J., **II.5.277**
 Gärtner, S., **I.2.295**
 Gasparich, G.E., **II.4.1**
 Gast, P., **I.3.953**
 Gau, A.E., **I.2.295**
 Gaugain, F., **IV.17.409**
 Gaul, D., **I.1.113**
 Geacintov, N.E., **I.2.467, II.4.125**
 Geiken, B., **II.6.373**
 Gennis, R.B., **III.10.263**
 Genty, B., **IV.16.259, IV.17.337, IV.17.365, IV.17.369**
 George, G.N., **I.3.685**
 Georgi, S., **III.11.385**
 Gepstein, S., **III.11.411**
 Geraghty, A.M., **IV.18.505**
 Gerhardt, V., **I.3.853, I.3.857**
 Gerken, S., **I.3.837**
 Gerrish, C., **III.13.759**
- Geva, N., **III.11.411**
 Ghanatry, J.A., **II.4.73,**
 Ghanotakis, D.F., **I.2.275, I.2.643**
 Ghirardi, M.L., **II.8.733**
 Ghosh, R., **II.4.77**
 Giacometti, G.M., **I.2.339, II.6.419**
 Giardi, M.T., **I.2.339, II.6.419**
 Gibbs, P., **IV.17.329**
 Gillbro, T., **II.4.11, II.4.117, II.4.181, II.5.301**
 Gillham, N.W., **III.12.509**
 Gilmore, A.M., **II.6.495**
 Gimenez, P., **IV.15.95**
 Gimmler, H., **IV.19.769, IV.19.773**
 Gingras, G., **I.1.125**
 Giorgi, L.B., **I.2.415, II.6.519**
 Girard-Bascou, J., **III.12.437**
 Girault, G., **III.9.65**
 Girvin, M.E., **III.10.271**
 Glaser, E., **III.13.815**
 Glauser, M., **II.4.89,**
 Gleason, F.K., **IV.16.175**
 Gleiter, H.M., **I.2.479, I.2.531**
 Gnanam, A., **III.12.633**
 Godik, V.I., **II.4.157**
 Goetze, D.C., **II.7.691**
 Golbeck, J.H., **II.6.401, II.7.531**
 Golden, S.S., **II.6.431, II.8.863, III.12.445**
 Goldfeld, M.G., **III.9.105, III.9.111**
 Goldschmidt-Clermont, M., **III.12.437**
 Goltsev, V., **IV.19.699**
 Gomez-Moreno, C., **II.7.663**
 Gong, H., **II.6.397**
 González, M.S., **IV.15.47, IV.17.397**
 González-Murua, C., **IV.19.789**
 Goodchild, D.J., **II.8.803**
 Gorgé, J.L., **IV.16.163, IV.16.251**
 Görlach, J., **III.14.857**
 Gornicka, O., **II.8.887**
 Gottstein, J., **II.4.45,**
 Gough, S.P., **III.12.585**
 Gounaris, K., **I.2.223, I.2.327**
 Govindjee, **I.2.451, I.2.459, I.2.511, I.2.515**
 Gräber, P., **III.9.15, III.9.33, III.9.37, III.9.217**
 Grandoni, P.A., **III.9.145**
 Granok, H., **I.2.367**
 Granot, G., **IV.15.55**
 Gratton, E., **I.2.459,**
 Grätzel, M., **I.2.619,**
 Gravett, A.E., **II.6.475**
 Gray, J.C., **III.10.267, III.12.461, III.12.625**

- Gray, K.A., I.1.201
 Grechkin, A.N., IV.17.429
 Green, B.R., I.2.659, III.12.553
 Green, J.P., I.3.725, I.3.781, III.9.9
 Greenberg, B.M., I.2.209,
 Greer, D.H., II.6.365
 Greis, J., I.1.145
 Greve, B., IV.15.99
 Gribenow, K., II.4.141, II.4.177
 Grieve, C.M., IV.19.749
 Grime, P., IV.17.361
 Grimm, B., III.12.585
 Grimme, L.H., II.7.607, II.8.855, IV.17.405
 Grodzinski, B., IV.15.35, IV.15.79,
 IV.19.809
 Gromet-Elhanan, Z., III. 9.45
 Groom, Q.J., II.6.463
 Groome, Q., IV.20.835
 Gross, A., IV.16.203
 Gross, E.L., III.10.299, III.10.307,
 III.10.311
 Gross, R., I.2.315
 Grossman, A.R., III.12.541
 Gruenberg, H., I.1.201
 Gu, W., III.11.339
 Gudowska-Nowak, E., II.4.149
 Guikema, J.A., II.7.563, III.13.739
 Guiles, R.D., I.3.789,
 Gulyaev, B.A., I.2.427
 Gunner, M.R., I.1.47,
 Günther, G., IV.16.207, IV.16.211
 Guo, Y.-S., II.7.695
 Gustafsson, P., II.6.431, III.12.537
 Guyon, D., II.5.277

 Haag, E., I.2.375, I.2.479, I.3.869
 Habash, D., IV.17.337
 Hachtel, W., III.12.621
 Haddy, A., I.3.753, I.3.777
 Hachnel, W., II.7.611, II.7.675, II.8.739
 Hagelstein, P., III.14.857
 Hagemann, R., III.12.429
 Haining, R.L., III.11.355
 Hák, R., IV.20.899
 Hala, J., II.4.205
 Halevy, A.H., IV.17.417
 Haley, B.E., III.11.363
 Halford, N., III.11.351, III.11.371
 Halkier, B.A., II.7.523
 Hall, D.O., I.2.619, II.6.487, II.7.699
 Hällgren, J.-E., IV.19.805
 Hallick, R.B., III.12.491

 Hammes, S., I.1.113
 Hanaoka, T., IV.19.615
 Hanke, W., III.9.83
 Hansson, Ö., I.1.97, I.2.439, I.2.475, I.3.777
 Hanssum, B., I.3.845
 Haraux, F., III.9.141, III.9.153
 Harbinson, J., IV.16.259, IV.17.365
 Harmey, M.A., III.13.815
 Harnett, T., I.2.291,
 Harnois, J., III.10.295
 Harris, D.A., III. 9.41
 Harris, E.H., III.12.509
 Harrison, M., IV.17.333
 Hartman, F.C., III.11.343
 Hase, E., III.11.391, III.12.629, III.13.735
 Hatch, M.D., IV.18.541
 Hauska, G., II.8.783
 Hawthornthwaite, A.M., II.4.137
 Hayashi, H., I.1.73,
 Hayashida, N., III.13.767
 Hayden, D.B., IV.19.691
 He, W.-Z., I.2.431
 Heber, U., IV.19.753
 Heckmann, R., I.1.153
 Hedrich, R., III.9.137
 Hegde, U., I.2.247
 Heineke, D., IV.15.1, IV.16.191
 Heintze, A., III.14.857
 Heldt, H.W., IV.15.1, IV.16.191, IV.16.227
 Heller, B.A., II.4.65, II.4.73
 Henricson, D., IV.15.59
 Henry, R.L., II.7.567, III.13.739
 Henrysson, T., II.8.759
 Heras, L., II.6.499
 Hermann, R., II.8.783
 Hermoso, R., IV.16.163, IV.16.251
 Herrmann, R.G., II.5.253
 Herzfeld, F., III.14.869
 Heupel, R., IV.15.1
 Hibino, T., III.13.719
 Hideg, E., I.2.623, I.3.809
 Hienerwadel, R., I.1.85, I.3.841
 Higashi, S.-I., I.2.403
 Hiller, R.G., III.12.545
 Hind, G., II.7.667
 Hinrichs, W., II.7.547
 Hinsch, K.-D., II.8.787
 Hioki, Y., II.5.241
 Hippler, M., II.7.675
 Hiramatsu, H., III.13.771
 Hird, S.M., III.12.461
 Hirschberg, J., III.12.641

- Hisabori, T., III.9.73, III.9.169
 Hiyama, T., I.2.351, II.7.587
 Hladik, J., II.7.579
 Hoadley, J., I.2.431
 Hodges, M., II.8.875
 Hodgson, R.A.J., I.2.323
 Hoff, A.J., I.1.177, I.2.487, II.7.711
 Hoffmann, D., I.3.853, I.3.857
 Hoffmann, P., III.14.885
 Hoffstädt, J., IV.16.187
 Hoganson, C.W., III.10.319
 Høj, P.B., II.7.523
 Holt, R.E., II.8.907
 Holten, D., I.1.113
 Holzapfel, W., I.1.27,
 Holzwarth, A.R., I.2.387, I.2.443, II.4.141,
 II.4.177, II.5.223, II.5.297, II.7.611
 Hong, L., III.12.491
 Hong, Y., II.7.667
 Honig, B., I.1.47,
 Hooper, J.K., III.13.723
 Hopkins, R.M., II.6.451
 Hoppe, P., III.14.857
 Horio, T., I.2.319, III.12.517
 Horovitz, A., III.12.641
 Horton, P., I.2.391, I.2.399, I.2.627, I.2.631,
 II.6.507, IV.16.111, IV.16.219, IV.16.223,
 IV.17.361
 Hory, F.E., III.13.695
 Hoshina, S., II.7.571
 Hosoda, T., III.9.73
 Houmar, J., II.4.101
 Howard, R., III.11.419
 Howe, G., III.13.711
 Høyer-Hansen, G., III.13.783
 Huault, C., III.14.873
 Hubbard, J.A.M., I.1.189, I.2.523, I.2.551,
 I.3.793, II.8.919
 Hull, M.R., IV.19.675, IV.19.683
 Humbeck, K., I.2.655
 Hundal, T., II.6.423
 Huner, N.P.A., II.6.467, II.6.471, III.14.861,
 IV.17.313, IV.19.631, IV.19.643
 Hunter, C.N., II.4.153, II.4.173
 Huppe, H.C., IV.16.179
 Hurry, V., II.6.467, IV.17.313
 Husic, H.D., IV.18.493

 Ichimura, N., III.12.517
 Ichimura, T., I.2.583
 Ideguchi, T., III.12.517
 Iglesias, A.A., IV.18.537

 Iizuka, Y., IV.19.615
 Ikegami, I., II.7.643
 Ikeuchi, M., I.2.347, I.2.351, I.2.507
 Inaba, H., I.2.623
 Inagaki, J., I.2.287
 Inagaki, N., III.13.763
 Iñiguez, F.J., IV.19.695
 Innes, J.B., I.3.817
 Inoué, H., I.3.917
 Inoue, K., II.7.655
 Inoue, Y., I.2.347, I.2.351, I.2.507, I.3.701,
 I.3.741, I.3.801, I.3.909, II.6.409
 Inui, T., I.3.765
 Irrgang, K.-D., I.2.355, I.2.375
 Isaacson, R.A., I.1.141
 Ish-Shalom, D., III.13.823, IV.19.709
 Ishidsu, J.-I., II.4.49
 Ishii, R., IV.20.895
 Ishikawa, H., III.13.719
 Ishimaru, T., II.5.309
 Isogai, Y., I.3.813
 Israels, R., II.4.97,
 Itoh, S., I.3.813, II.7.571, II.7.643, II.7.647,
 II.7.651
 Iwaki, M., II.7.647, II.7.651
 Iwata, N., II.8.927

 Jacquot, J.-P., IV.16.159, IV.16.179,
 IV.16.243, IV.16.247
 Jagendorf, A.T., III.9.29
 Jahnke, L.S., IV.19.683
 Jahns, P., I.3.881
 James, M.R., III.13.699, IV.18.545
 Janjic, V., IV.19.725
 Janowitz, A., IV.16.211
 Janssen, L.H.J., IV.20.931
 Jansson, C., I.2.299, III.12.565, III.12.649
 Jansson, S., III.12.537
 Jawali, N., III.11.407
 Jegerschöld, C., II.6.349, II.6.405
 Jelić, G., III.13.683
 Jenkins, C.L.D., IV.18.541
 Jennings, R.C., II.5.313, II.5.317
 Jensen, M.T., II.8.939
 Jepsen, L.B., III.12.609, III.12.613
 Jewell, C.J., I.2.569
 Jewess, P., I.2.603
 Jiao, J.-A., IV.15.35, IV.16.135
 Jide, Z., IV.19.647
 Jie, T., I.1.205
 Johnson, A.M., III.12.509
 Johnson, D.G., I.2.451, IV.17.361

- Johnson, L.B., IV.19.691
 Joliot, A., III.10.247
 Joliot, P., II.8.879, III.10.247
 Jones, A.R., III.12.509
 Jones, H.G., IV.20.907
 Jortner, J., I.1.11,
 Joshi, P.N., I.2.651
 Jovanovic, L., IV.19.725
 Juhler, R., IV.19.793
 Junesch U., III. 9.15
 Junge, W., I.3.877, I.3.881, III.9.81, III.9.97,
 III.9.133, III.9.137,
 Jursinic, P.A., IV.17.349, IV.17.353
 Juszcak, L.J., II.4.125
- Kaino, N., III.12.517
 Kaiser, W.M., I.1.27, IV.19.557
 Kakuno, T., I.2.319, III.12.517
 Kaladharan, P., IV.20.903
 Källebring, B., I.1.97
 Kalosaka, K., I.3.721
 Kamachi, H., I.3.917
 Kamo, M., IV.16.167
 Kamoh, K., I.2.499
 Kane, H.J., III.11.331
 Kaneko, M., I.2.319,
 Kannagara, C.G., III.12.585, III.13.807
 Kaplan, A., IV.18.463
 Kapsa, V., II.8.825
 Karapetyan, N.V., I.2.559,
 Karukstis, K.K., I.2.569,
 Katerji, N., IV.20.855
 Katoh, S., I.2.319, I.2.583, I.3.737, II.7.595,
 II.7.643, II.8.859
 Katz-Downie, D.S., III.12.475
 Kawamori, A., I.3.765
 Kawamoto, K., I.3.889,
 Kebire, M.S., III.13.695
 Keegstra, K., III.13.799
 Kellogg, E.C., I.1.129,
 Kennedy, I.R., IV.15.23
 Kessel, M., IV.18.463
 Kessissoglou, D., I.3.709,
 Kettleborough, C.A., III.11.351
 Keys, A.J., III.11.371, III.11.395, III.11.351
 Kim, B.-H., III.12.517
 Kim, D.H., I.3.769,
 Kingston-Smith, A.H., III.11.395
 Kipper, M., I.2.217
 Kirilovsky, D., I.2.543, II.6.427
 Kirmaier, C., I.1.113
 Kitamura, T., I.3.917
- Kitaoka, S., IV.16.199, IV.19.615
 Kitatani, Y., I.2.583
 Kittsteiner, U., III.13.679
 Klein, M.P., I.3.761, I.3.769, I.3.789,
 Kleinherenbrink, F.A.M., II.4.145, II.4.189
 Klevanik, A.V., I.1.117
 Kliffen, C., IV.19.817
 Klimov, V.V., I.2.247, I.2.379
 Klopstech, K., IV.19.579, IV.19.709
 Klug, D.R., I.2.415, I.2.455, I.2.611, II.6.519
 Klyuchareva, E.A., III.13.819
 Knack, G., IV.19.579
 Knobloch, K., III.9.185
 Knoetzel, J., II.8.867
 Knoppik, D., IV.19.607
 Knorpp, C., III.13.815
 Knudsen, J., II.8.939
 Ko, K., III.13.779
 Kobayashi, M., I.3.885, II.4.109
 Kobayashi, T., I.3.913
 Kobayashi, Y., II.8.927
 Koch, B., II.7.523, II.7.671
 Kochubey, S.M., II.8.791, II.8.795
 Koenig, F., IV.17.373
 Koepke, J., I.1.173
 Koike, H., I.2.347, I.2.351, I.2.507
 Kolaczowski, S., I.1.129,
 Kolber, Z., IV.20.923
 Komenda, J., II.6.389
 Komissarov, G.G., IV.15.107
 Komiya, H., I.1.61,
 Korstanje, L.J., II.8.755
 Kotvalt, V., IV.20.899
 Kotzabasis, K., III.14.881, IV.16.287
 Kramer, D.M., II.6.381, III.9.89, III.10.283
 Krause, G.H., II.6.479, II.6.483
 Kretschmann, H., I.3.837
 Kreutz, W., I.3.841
 Krieger, A., I.2.563, IV.17.307
 Krishnaswamy, S., III.12.633
 Krogmann, D.W., II.7.687, III.10.303
 Krol, M., III.14.861, IV.17.313
 Krömer, S., IV.15.1
 Krstic, B., IV.20.879, IV.20.887
 Kruleva, L., IV.19.699
 Krupa, Z., II.6.431
 Ku, M., IV.17.393
 Kuang, T.-Y., I.2.335
 Kugel, H., IV.19.769
 Kühlbrandt, W., II.5.217
 Kuhlmann, M., I.2.295
 Kühne, U., III.14.869

- Kulandaivelu, G., **IV.19.813**
 Kulikov, A.V., **I.2.379**,
 Kumar, A., **III.14.877**, **IV.16.275**
 Kumar, P.A., **IV.15.67**
 Kunishima, N., **II.7.571**
 Kusumoto, N., **II.7.655**
 Kusunoki, M., **I.3.801**
 Kutsunai, S., **III.13.711**
 Kuwabara, T., **III.13.743**
 Kuwata, K.T., **I.2.569**,
 Kuznetsova, N.Yu., **I.2.283**
 Kwa, S.L.S., **I.2.279**,

 Laasch, H., **III.9.161**, **IV.16.207**, **IV.16.211**
 Labahn, A., **III.9.37**
 Labanowski, J., **III.10.311**
 Lachica, M., **I.2.303**
 Lacuesta, M., **IV.19.789**
 Lagenfelt, G., **I.2.527**, **III.10.319**
 Lah, M.S., **I.3.709**,
 Laing, W.A., **II.6.365**
 Laisk, A., **I.2.663**
 Lamppa, G.K., **II.5.231**, **III.13.731**
 Lang, E., **I.1.137**, **I.1.153**
 Lange, W., **II.4.105**
 Lannoeye, R., **IV.17.425**, **IV.19.671**,
IV.19.785
 Lapointe, L., **IV.19.631**
 Larkum, A.W.D., **II.5.333**, **II.6.385**
 LaRoche, J., **IV.17.357**
 Larson, E., **I.3.709**,
 Larsson, C., **IV.18.517**, **IV.18.521**,
IV.18.525, **IV.18.529**, **IV.18.533**
 Larsson, S., **I.1.97**
 Larsson, U.K., **II.5.253**, **II.8.759**, **II.8.799**,
II.8.835, **II.8.839**
 Larsson-Raźnikiewicz, M., **IV.16.155**
 Lassiter, C.B., **IV.16.271**
 Latzko, E., **IV.16.187**
 Lauteri, M., **IV.19.741**
 Lavergne, J., **I.3.873**, **I.3.893**, **II.8.879**
 Lawlor, D.W., **IV.19.663**
 Lázaro, J.J., **IV.16.163**, **IV.16.251**
 Lazova, G.N., **IV.18.479**
 Le Marechal, P., **II.8.875**, **IV.16.247**
 Lea, P.J., **IV.15.15**, **IV.19.595**
 Lebedeva, N.V., **III.12.645**
 Lechamy, A., **IV.20.871**
 Lechner, E., **IV.19.591**
 Lechtenberg, D., **IV.16.171**, **IV.17.307**
 Lee, C.-H., **I.2.387**
 Lee, E.H., **III.11.343**

 Lee, P., **IV.16.219**
 Leibl, W., **II.5.305**, **II.5.329**
 Lelandais, M., **II.6.483**
 Lemieux, S., **I.2.343**
 Lemoine, Y., **II.6.491**
 Lempert, U., **III.13.703**
 Lennon, M., **III.13.687**
 Leonhard, M., **I.1.85**, **I.1.89**, **I.2.463**, **II.7.599**
 Lersch, W., **I.1.137**, **I.1.153**
 Leu, S., **III.12.569**, **III.13.811**, **III.13.823**,
III.9.193, **IV.20.851**
 Levine, Y.K., **II.5.337**, **II.5.345**, **II.8.755**
 Lewis, A., **III.9.29**
 Lewis, D., **IV.16.219**
 Lewis, K.J., **IV.15.15**
 Lhomme, J.-P., **IV.20.855**
 Li, L.-R., **III.11.377**
 Li, M., **II.7.563**, **III.13.739**
 Li, S.-J., **II.7.695**
 Li, T.-Z., **I.2.335**
 Li, X., **I.3.709**,
 Liese, F., **III.10.279**
 Likhsteinstein, G.I., **I.2.379**,
 Lill, H., **III.9.1**, **III.9.133**
 Lin, C.P., **I.3.953**
 Lin, S.-Q., **I.2.335**
 Lindberg-Møller, B., **III.12.609**
 Lindblom, G., **III.14.843**
 Lindqvist, Y., **III.11.323**
 Lingberg-Møller, B., **III.12.613**
 Lipp, G., **IV.17.421**
 Liu, B.-L., **I.1.177**
 Liu, Z., **IV.19.579**
 Ljungberg, U., **II.5.253**
 Lloyd, J.C., **III.12.601**
 Loach, P.A., **II.4.65**, **II.4.69**, **II.4.73**, **II.4.133**
 Lobysheva, I.I., **III.9.111**
 Lockett, C.J., **I.2.411**, **I.2.519**, **I.2.551**,
I.3.717
 Lockhart, D.J., **I.1.113**
 Logsdon, Jr., J.M., **III.12.475**
 Lohse, D., **III.9.121**
 Long, S.P., **II.6.463**, **II.6.475**, **IV.19.565**,
IV.19.591, **IV.19.675**, **IV.19.683**,
IV.20.835
 Longstaff, M., **III.12.601**
 Loreto, F., **IV.19.549**
 Lorimer, G., **III.11.419**
 Los, D.A., **III.12.593**, **III.12.645**
 Lou, S.-Q., **I.2.335**
 Lous, E.J., **I.1.61**,
 Lovelock, C., **IV.20.859**

- Lu, T., **II.8.907**
 Lübbers, K., **I.3.877**
 Lubitz, W., **I.1.141, I.2.531**
 Lucero, H.A., **II.8.895**
 Lücken, U., **III.9.33**
 Lühning, H., **III.9.81**
 Luinenburg, I., **III.12.581**
 Lundin, M., **III.9.197, III.9.201**
 Lundqvist, T., **III.11.323, III.11.419**
 Lutz, M., **I.2.423**
- Møller, B.L., **II.7.523, II.7.671, II.7.679**
 Møller, I.M., **II.8.813**
 Macharia, J.M.N., **IV.20.835**
 Macmillan, F., **I.2.531, I.3.749**
 Madden, M., **III.11.419**
 Mäenpää, P., **II.5.273**
 Maggard, S., **I.3.929**
 Maguhn, J., **IV.19.607**
 Mahajan, S., **II.4.197**
 Mahalingham, S., **III.10.263**
 Majeu, N., **IV.18.485**
 Makhneva, Z.K., **IV.17.345**
 Malinowski, H., **III.13.679**
 Malkin, R., **II.7.575, IV.17.321**
 Maloney, M.A., **III.13.723**
 Malyan, A.N., **III.9.69**
 Mamada, K., **I.2.347, I.2.351**
 Mamushina, N., **IV.15.103**
 Manodori, A., **III.12.541**
 Mäntele, W., **I.1.77, I.1.81, I.1.85, I.1.89, I.2.463, I.3.841, II.4.121, II.7.599**
 Mar, T., **I.1.125**
 Marani, A., **IV.19.733**
 Marano, M.R., **III.14.865**
 Marcus, R.A., **I.1.1**
 Marder, J.B., **I.2.307, II.6.415**
 Marek, L.F., **IV.18.509**
 Marino, J., **I.3.953**
 Markgraf, T., **IV.16.279**
 Marks, D.B., **III.13.723**
 Maroc, J., **II.5.277**
 Maróti, P., **I.1.165, I.1.169**
 Marques da Silve, J., **IV.20.863**
 Marrs, B.L., **III.13.707**
 Martin, J.E., **I.1.121**
 Maruthi Sai, P.S., **II.4.197**
 Masojfdek, J., **II.6.389**
 Massacci, A., **IV.20.907**
 Mathis, P., **I.1.173, I.1.197, I.2.439, I.2.475, I.2.535**
 Mathur, P., **I.3.773**
- Matsuoka, M., **III.12.577**
 Matsushita, T., **I.3.801**
 Matsuura, K., **I.1.193**
 Matthijs, H.C.P., **II.4.201, II.7.667**
 Mattoo, A.A., **II.8.733**
 Mattoo, A.K., **I.2.209**
 Mauro, S., **II.7.683, IV.17.425, IV.19.671**
 Mayes, S.R., **III.12.617, III.12.637**
 Mazzola, L., **I.1.113**
 McCauley, S.W., **II.5.297**
 McDermott, A.E., **I.3.789**
 McFadden, B.A., **III.11.355, III.11.359**
 McIntosh, L., **I.2.239, I.2.483, III.12.499, III.12.649**
 McKiernan, M., **IV.17.369**
 McLilley, R., **IV.16.119**
 McMorrow, E.M., **III.12.601, IV.16.147, IV.16.155**
 McPherson, P.H., **I.1.39**
 Medrano, H., **IV.15.39, IV.19.729**
 Mei, R., **I.3.729**
 Melandri, B.A., **III.9.85**
 Melis, A., **II.6.435, IV.17.291**
 Merchant, S., **III.13.711**
 Messenger, J., **I.3.845, I.3.849**
 Mets, L.J., **II.8.779**
 Metz, J.G., **I.2.471**
 Meunier, P.C., **I.2.331**
 Michaeli, D., **II.7.555**
 Michaels, A., **III.9.193, III.12.573, III.13.811, III.13.823, IV.20.851**
 Michalski, T., **II.4.69**
 Michel, H., **I.1.173, I.3.933**
 Michel, H.P., **II.8.747**
 Michel-Beyerle, M.E., **I.1.11, I.1.19, I.1.133, I.1.153, I.1.137**
 Michelsen, B., **IV.19.761**
 Middendorf, D., **I.1.101, I.1.121**
 Miginiac-Maslow, M., **II.8.875, IV.16.159, IV.16.243, IV.16.247**
 Mikami, K., **III.13.767**
 Mikoyan, V.D., **III.9.105, III.9.111**
 Miles, D., **III.12.589**
 Miller, A.G., **IV.18.513**
 Miller, M., **II.4.181, IV.19.761**
 Millner, P.A., **II.8.767, II.8.787**
 Mills, D., **III.9.49**
 Mills, W.R., **IV.16.271**
 Mimuro, M., **II.4.193, II.5.241, II.5.309**
 Minliang, G., **IV.18.497**
 Miranda, M.A., **IV.19.781**
 Mishra, R.K., **IV.19.655**

- Mitchell, R., II.8.739
 Miyachi, S., IV.18.467
 Miyao-Tokutomi, M., I.3.909,
 Mizioroko, H.M., IV.15.87
 Mizobuchi, A., I.2.287, III.13.771
 Mochizuki, Y., I.2.319,
 Moenne-Loccoz, P., I.1.65, I.2.423
 Moerschbacher, B., IV.19.797
 Mogel, S.N., III.11.359
 Mohamed, A., III.12.565
 Moholt-Siebert, M., IV.19.705
 Molnar, S.A., III.10.299
 Monge, E., II.6.499, IV.19.765
 Montañes, L., II.6.499
 Montiel-Canobra, P.O., IV.16.155, IV.19.599
 Moormans, R., II.8.755
 Moorthy, P., III.13.699, IV.18.545
 Mor, T.S., II.8.783
 Morales, F., IV.19.757
 Morand, L.Z., III.10.303
 Morell, M.K., III.11.331
 Morgun, V., IV.20.915
 Morin, F., IV.17.409
 Morisette, J.-C., I.2.635, I.2.647
 Morishige, D.T., II.5.261
 Morita, E.H., I.1.73,
 Morita, M., III.10.315, IV.15.91
 Morita, Y., I.3.913
 Moroney, J.V., IV.18.449
 Morris, A.L., I.1.181
 Mörschel, E., II.4.105
 Mortain-Bertrand, A., IV.17.357
 Moskalenko, A.A., I.2.283, II.4.81
 Moss, D.A., I.1.85
 Mostowska, A., III.13.679
 Moualem-Beno, D., IV.17.401
 Mould, R., III.13.665
 Moundib, R., IV.19.777
 Mueller, M., II.5.297
 Mühlhoff, U., II.7.547
 Mukerji, I., II.5.321
 Mulay, M., I.2.247
 Müller, H., III.9.185
 Müller, M.G., II.4.177
 Mullet, J.E., III.12.423
 Muñoz-Rueda, A., IV.19.789
 Mur, L.R., II.4.201
 Murata, N., I.2.403, I.3.937, I.3.957
 Mustardy, L., IV.17.349, IV.17.353
 Myers, J., IV.15.63
 Nabadryk, E., I.1.77, I.1.81, I.1.85, I.1.89,
 I.2.463, II.7.599
 Nadanaciva, S., III.9.41
 Nagarajan, V., I.1.101, I.1.121
 Nakamoto, H., IV.16.183
 Nakane, H., I.2.271, I.2.311
 Nalty, M.S., III.12.445
 Namikawa, H., III.12.517
 Napiwotzki, II.6.373
 Nátr, L., IV.20.899
 Neale, P.J., II.6.435
 Nechushtai, R., II.7.555, III.13.661
 Nedbal, L., II.6.389
 Nelson, K.P., III.12.491
 Nelson, N., III.9.1
 Nemoto, H., III.9.169
 Nénonéné, E.K., I.3.945
 Nesbakken, T., IV.20.935
 Nespoulous, C., III.11.381
 Neumann, K.-H., IV.16.275
 Newell, W.R., I.2.279,
 Newman, S.M., III.12.509
 Newton, M.D., II.4.149
 Nguyen, A.P., I.3.829,
 Nie, G.Y., IV.19.565, IV.19.687
 Niederman, R.A., II.4.33, II.4.57, II.4.129,
 III.10.259
 Nielsen, H.L., II.7.523
 Nilsen, S., II.6.397
 Nilsson, F., I.2.299,
 Nishimura, M., I.3.813
 Nishise, H., III.12.517
 Nitschke, W., I.2.535
 Nixon, P.J., I.2.259, I.2.471
 Nobel, P.S., IV.20.821
 Noctor, G., I.2.627
 Nore, B.F., III.9.23, III.9.205
 Norling, B., III.9.173
 Norman, J., IV.19.705
 Norris, J.R., I.1.109, I.1.181
 Nothnagel, D., IV.16.187
 Nugent, J.H.A. I.2.411, I.2.603, I.2.519,
 I.2.523, I.2.551, I.3.717
 Nunes, M.A., IV.19.721
 Nurmi, A., II.6.439, III.13.795, IV.17.381
 Nyhus, K.J., I.2.367
 Nyrén, P., III.9.23, III.9.173, III.9.177,
 III.9.181, III.9.197, III.9.209
 Obokata, J., III.13.767
 Oelze, J., II.4.41,
 Oesterhelt, D., I.1.27, I.1.197, I.1.201
 Oettmeier, W., I.2.591

- Offermann, K., III.12.483
 Ogasawara, Y., III.12.629
 Ogawa, T., III.12.525, IV.18.471
 Ogiso, H., II.7.587
 Ögren, E., I.3.949
 Ogrodnik, A., I.1.19, I.1.133, I.1.153
 Ohad, I., II.6.409, II.8.779, II.8.783,
 III.13.823, IV.19.709
 Ohad, N., III.12.641
 Ohta, Y., III.9.169
 Okamura, M.Y., I.1.39, I.1.77, I.1.141,
 I.1.161
 Okkels, J.S., II.7.523, II.7.671, II.7.679,
 III.12.609, III.12.613
 Oku, T., II.8.927
 Olivera, L.M., II.4.33
 Olsen, I., II.7.523
 Olson, J.M., II.4.37, II.8.939
 Omata, T., III.12.525, IV.18.471
 Ong, J.E., IV.20.859
 Ono, T., I.3.801
 Ono, T.-A., I.2.507, I.3.701, I.3.741, I.3.909
 Ooms, J.J.J., II.8.883, III.9.213
 Öquist, G., II.6.431, II.6.471, IV.17.313,
 IV.19.623
 Orgen, W.L., IV.18.475
 Ormerod, J., IV.20.935
 Ort, D.R., III.9.145, IV.19.565
 Ortiz-Lopez, A., IV.19.565
 Osafune, T., III.11.391, III.12.629,
 III.13.735
 Oswald, A., III.12.483
 Ottander, C., IV.19.623
 Ottersbach, P., IV.19.579
 Otto, B., IV.19.579
 Otto, J., III. 9.61
 Ottosen, C.-O., I.3.949
 Ou, K.-L., III.13.687
 Ougham, H.J., III.13.747
 Owens, T.G., II.5.289, II.5.293, IV.19.627
 Oxborough, K., III.9.145
 Oyanagi, H., I.3.801

 Packer, J., III.13.759
 Packer, N., III.13.687
 Paddock, M.L., I.1.39, I.1.161
 Padhye, S., I.2.247
 Paillotin, G., II.5.329
 Pais, M.S., IV.17.413
 Pakrasi, H.B., I.2.291, I.2.323, I.2.363,
 I.2.367
 Paliwal, R., I.2.371, I.2.407

 Palmer, J.D., III.12.475
 Palmqvist, K., IV.18.441
 Pammenter, N.W., II.6.443, IV.15.71,
 IV.15.75, IV.20.919
 Pančoška, P., II.8.821
 Pankratova, S.I., IV.17.429
 Panneels, P., IV.19.785
 Papageorgiou, G.C., I.3.957
 Parkes-Loach, P.S., II.4.65, II.4.69, II.4.73,
 Pärmik, T., III.11.415
 Parry, M.A.J., III.11.351, III.11.371,
 III.11.395, III.13.795
 Parson, W.W., I.1.101, I.1.121, I.1.31,
 Pascual, M., IV.19.695
 Patzke, J., IV.19.573
 Paul, K., III.11.331
 Paul, M.J., IV.19.663
 Paulino, C., IV.19.659
 Paulsen, H., III.13.727
 Pauly, S., I.3.745, I.3.837
 Pecoraro, V.L., I.3.709
 Pedersen, J.P., II.4.37
 Pehu, E., III.13.795
 Peine, G., III.14.885
 Peng, D.-C., I.2.335
 Penner-Hahn, J.E., I.3.797
 Persson, A., II.8.923
 Petersen, J., I.2.239, I.2.263, I.2.539
 Peterson, R.B., I.2.395
 Peyre, J.B., IV.16.159
 Peyronnet, R., IV.16.159
 Pfündel, E., II.6.503
 Philippova, E.A., IV.19.801
 Phillips, A.L., III.11.351
 Phillips, J., I.2.587
 Philo, J.S., I.3.953
 Picaud, M., II.6.427
 Pichersky, E., III.12.553
 Pick, U., IV.19.773
 Picorel, R., I.2.575, II.8.907
 Pierce, J., III.12.525
 Pille, S., III.12.521
 Pilz, I., III.11.373
 Pimer, B., III.9.185
 Pistorius, E.K., I.2.295
 Plato, M., I.1.133, I.1.141
 Plaut, Z., IV.19.749
 Plesničar, M., IV.16.215, IV.16.267
 Plumley, F.G., II.5.341
 Podesta, F.E., IV.18.537
 Popova, L.P., IV.18.479
 Popovic, R., I.2.331, I.2.635, I.2.647

- Porra, R.J., **II.5.237**
 Porter, G., **I.2.415, I.2.455, I.2.611, II.6.519**
 Portis, Jr., A.R., **IV.16.119**
 Pospíšilová, L., **II.7.579**
 Post, A., **IV.19.635, IV.19.639, IV.19.709**
 Postl, W., **IV.15.31**
 Pramanik, A., **II.8.763, III.9.197, III.9.201**
 Prášil, O., **II.6.389**
 Prasil, O., **II.4.205**
 Prat-Gay, G., **IV.16.195**
 Preston, C., **I.2.451, I.2.459, I.3.925**
 Priatel, J.J., **III.12.453**
 Price, A., **IV.19.595**
 Prince, R.C., **I.3.685**
 Prioul, J.-L., **IV.20.871**
 Prokhorenko, I.R., **IV.17.345**
 Pronina, N.A., **IV.18.489**
 Pruijsen, G., **II.8.755**
 Pullerits, T., **II.4.157**
 Purvis, D.J., **III.10.259**
 Putzger, J., **I.3.853, I.3.857**
 Pålsson, L.O., **II.5.301**
- Quensel, J., **I.3.897**
 Quintanar, Z.R., **IV.15.47, IV.17.397**
- Radebaugh, C., **III.12.491**
 Radunz, A., **III.11.381, III.11.385**
 Raines, C.A., **III.12.601**
 Raines, C.R., **IV.19.675**
 Rakhimberdieva, M.G., **I.2.559,**
 Ramazanov, Z., **IV.18.441**
 Ramos, J.L., **IV.16.163**
 Randolph-Anderson, B.L., **III.12.509**
 Ranty, B., **III.11.419**
 Rao, K.K., **I.2.619,**
 Rapp, J.C., **III.12.423**
 Rappaport, F., **I.3.873**
 Raschke, K., **III.9.137, IV.19.573**
 Rashid, A., **I.2.595**
 Ratajczak, R., **II.7.611, II.7.675, II.8.739**
 Raval, M.K., **I.2.651**
 Ravnikar, P., **III.12.499**
 Rawal, R.K., **I.2.651**
 Rebeille, F., **IV.15.43, IV.15.83**
 Rees, D.C., **I.1.61, I.2.399, I.2.627, II.6.507**
 Rehm, A.M., **IV.17.377**
 Reisener, H.J., **IV.19.797**
 Reiss, T., **III.12.649**
 Reith, H., **II.4.201**
 Remy, R., **II.8.875**
 Ren, L., **III.11.373**
- Renger, G., **I.2.355, I.2.375, I.2.479, I.2.531,**
I.3.749, I.3.845, I.3.849, I.3.869, II.6.373
 Resta, C., **II.8.775**
 Reubeni, J., **IV.15.55**
 Reuter, R.A., **I.2.671**
 Reyss, A., **IV.20.871**
 Rhiel, E., **II.4.1**
 Rich, P.R., **III.10.239**
 Richards, W.R., **III.13.695**
 Richter, M.L., **II.6.377, III.9.49**
 Richter, P., **IV.16.287**
 Rieß, M.H., **IV.17.405**
 Ried, A., **IV.17.377**
 Riens, B., **IV.15.1**
 Rigoni, F., **I.2.339, II.6.419**
 Rijo, P.S., **IV.19.721**
 Rintamäki, E., **III.11.367**
 Ripley, B.S., **II.6.443**
 Robenek, H., **II.8.739**
 Robert, B., **I.1.65, I.2.423**
 Robinson, C., **III.13.665**
 Robinson, S.P., **IV.16.119**
 Rochaix, J.D., **III.12.437**
 Rodrigues, M.A., **II.8.851**
 Rodriguez, F., **IV.19.781**
 Rodriguez-Suarez, R., **IV.16.195**
 Roegner, M., **I.2.471**
 Roelofs, T.A., **I.2.387, I.2.443**
 Roepstorff, P., **III.12.609**
 Roeske, C.A., **IV.16.135, IV.18.475**
 Rögner, M., **I.2.259, II.7.547**
 Römer, S., **I.2.655**
 Rongey, S.H., **I.1.161, I.1.39,**
 Rosengard, F., **I.3.833**
 Rosenqvist, E., **I.3.949**
 Rowland-Bamford, A.J., **III.11.399**
 Roy, S., **III.14.877, IV.16.275**
 Rubin, A.B., **I.2.427**
 Rüdiger, W., **III.13.679, III.13.703,**
III.13.727
 Rühle, W., **II.6.377, II.8.827**
 Rumbeli, R., **II.4.93,**
 Rumberg, B., **III.9.157, III.9.125, III.10.275,**
III.10.279
 Rutherford, A.W., **I.1.173, I.2.535, I.3.713**
 Ryberg, H., **II.8.813, IV.18.517, IV.18.521,**
IV.18.525, IV.18.529, IV.18.533,
 Ryberg, M., **II.5.253**
- Šetlík, I., **II.6.389, II.7.563, IV.17.341**
 Šetlíková, E., **II.7.563**
 Saadeh, S., **I.3.709,**

- Sadovnick, E., IV.18.463
 Saenger, W., II.7.547
 Safina, N.I., IV.19.801
 Saftić, D., IV.16.267
 Sagara, T., I.3.885
 Sahrawy, M., IV.16.163
 Sainis, J.K., III.11.407
 Sakac, Z., IV.20.911
 Sakai, Y., III.9.205
 Sakurai, H., II.7.655, II.7.707, III.9.73,
 III.9.169
 Salih, G.F., III.9.23, III.9.209
 Salnikow, J., III.11.373
 Salter, A.H., III.10.267
 Salvucci, M.E., III.11.363
 Samejima, M., III.12.577, IV.20.867,
 IV.20.895
 Samson, G., I.2.635, I.2.647
 Samuelsson, G., IV.18.441
 Sanadze, G.A., IV.16.231, IV.16.239
 Sandelius, A.S., II.8.813
 Sandmann, G., I.2.303
 Sane, P.V., II.6.393, II.6.447
 Sangalli, A., II.8.775
 Sano, S., I.2.495
 Santhanam, R., III.13.699
 Santos, C.P., II.8.851
 Saric, M.R., IV.20.875, IV.20.879, IV.20.887
 Sarrey, F., IV.15.83
 Sasaki, H., IV.20.895
 Satoh, K., I.2.271, I.2.319, I.2.439, I.2.475,
 I.2.499, I.2.583, III.13.763
 Sauer, K., I.3.675, I.3.761, I.3.769, I.3.789,
 II.5.321
 Savchenko, G.E., III.13.819
 Saygin, Ö., I.3.837
 Scaramuzzi, C.D., III.12.545
 Schaafsma, T., I.2.419,
 Schaefer, M.R., II.8.863, III.12.445
 Schafheutele, M.E., II.7.563
 Scharll, M.-F., IV.19.671
 Schatz, G.H., II.4.105, II.7.611
 Scheer, H., I.1.27, II.4.45, III.13.691,
 IV.17.421
 Scheibe, R., IV.16.127
 Scheidel, G., I.1.133
 Scheller, H.V., II.7.523, II.7.671, III.12.609,
 III.12.613, II.7.679
 Schenck, C., I.1.113
 Scherer, S., IV.15.95
 Schiff, J.A., III.13.735
 Schiller, B., I.1.173
 Schimkat, D., IV.16.191
 Schmittmann, G., IV.19.797
 Schlodder, E., I.2.447, I.3.745, I.3.837
 Schmid, G.H., I.3.865, III.11.381, III.11.385
 Schmidt, G.W., II.5.341
 Schmitter, J.-M., IV.16.247
 Schneider, G., III.11.323, III.11.419
 Schneider, S., III.13.691
 Schober, M., III.13.703
 Schoch, S., III.13.703
 Schoefs, B., III.13.755
 Scholes, J.D., IV.16.219, IV.16.223,
 IV.17.361
 Schöner, S., II.6.483
 Schönfeld, M., I.1.39,
 Schönknecht, G., III.9.81, III.9.137
 Schröder, W.P., I.3.901
 Schrubar, H., III.12.483
 Schubert, K., III.10.279, III.9.125
 Schultz, G., III.14.857
 Schulze, E.-D., IV.20.827
 Schumann, J., III.9.129, III.9.161
 Schürmann, R., IV.16.167
 Schwarz, B., I.2.555
 Schwarz, R., IV.18.463
 Schwebel-Dugue, N., IV.20.871
 Scott, R.Q., I.2.623
 Sealey, R.V., II.6.451, II.6.455
 Searle, G., I.2.419
 Seibert, M., I.2.427, I.2.451, I.2.459, I.2.507,
 I.2.575, I.2.619, I.3.925, II.8.907
 Seidler, A., I.3.933
 Seijffers, J., IV.18.463
 Selman, B.R., III.9.165
 Selman-Reimer, S., III.9.165
 Selstam, E., III.14.843
 Semenenko, V.E., III.12.593, III.12.645,
 IV.18.489
 Sen, N., IV.20.927
 Senger, H., I.2.655, III.14.881, IV.16.287
 Sengupta, U.K., IV.20.891
 Serra, J.L., II.7.699
 Serrano, A., IV.15.95
 Sesták, Z., II.8.931
 Sétif, P., II.7.539, II.7.631
 Sexton, T.B., III.12.423
 Shackleton, J., III.13.665
 Shah, N., IV.16.151
 Shaolong, W., III.9.101
 Sharkey, T.D., IV.19.549
 Sharma, A., IV.20.891
 Sharma, P.K., II.6.487

- Sharp, P.J., III.12.601
 Sharp, R.R., I.3.821
 Shavit, N., III.9.193
 Shaw, S.L., II.5.269
 Sheats, J.E., I.3.773, I.3.953
 Shen, J.-R., I.3.737
 Shen, Y.-K., II.8.817, IV.20.843
 Shephard, M.C., IV.16.223
 Sherman, L.A. 255
 Sherudilo, E.G., IV.19.651
 Shestakov, S.V., III.12.645
 Shield, M.A., I.1.101
 Shigeoka, S., IV.19.615
 Shimada, K., I.1.193, II.4.49, II.4.193
 Shimizu, M., III.10.315
 Shin, M., II.7.659
 Shinkarev, V.P., I.1.185
 Shinohara, K., III.9.169, III.13.743
 Shioi, Y., III.14.853
 Shipton, C.A., II.6.415
 Shiqing, L., IV.19.647
 Shirasawa, S.-I., II.7.707
 Shiver, J.W., III.13.799
 Shkuropatov, A.Ya., I.1.117
 Shochat, S., II.6.409
 Shoham, G., II.7.555
 Shoji, T., I.3.913
 Shomer-Ilan, A., IV.17.401, IV.17.417
 Shreve, A.P., II.5.289, II.5.293
 Shuvalov, V.A., I.1.117
 Shyam, R., II.6.447
 Sidler, W., II.4.93, II.4.97
 Siebke, K., IV.19.753
 Siebzehnrübl, S., II.4.45, IV.17.421
 Sieckmann, I., II.7.623
 Siefermann-Harms, D., II.5.245
 Siegenthaler, P.-A., III.14.849
 Siegl, J., I.1.153
 Siemeister, G., III.12.621
 Sigrist, M., II.5.257
 Silva, C.B.C., II.8.847
 Silvestri, M., II.5.249
 Sim, R.G., IV.20.859
 Simoes, H.A., II.8.847
 Simon, E., IV.19.781
 Simpson, D.J., I.2.299, II.8.725, II.8.867
 Sinclair, J., I.2.571
 Singh, D., III.12.597
 Singh, M., II.6.393
 Singhal, G.S., I.2.371, I.2.407, IV.19.655
 Sinning, I., I.1.173
 Sithole, I., I.2.239, I.2.483, III.12.499
 Sivaguru, M., III.13.699, IV.18.545
 Sivak, M., IV.19.789
 Sivaraja, M., I.3.953
 Skála, L., II.8.825
 Sleator, N.J., III.12.491
 Slooten, L., III.9.149
 Small, C.L., III.11.355
 Smeekens, S., III.12.573
 Smith, A.J., III.13.807
 Smith, H.B., III.11.343
 Smith, S., II.7.687
 Smith, U., I.1.181
 Smith, V.R., IV.20.919
 Smith, W.K., IV.20.883
 Snel, J.F.H., II.8.911
 Snyder, W., II.4.1
 Sofrova, D., II.7.579
 Somersalo, S., II.6.479
 Soncini, F.C., II.8.871
 Sonoike, K., II.7.595
 Sopory, S.K., I.2.209, II.8.733
 Spalding, M.H., IV.18.505, IV.18.509
 Spangfort, M., II.5.253, II.5.265
 Sparrow, R., II.7.615
 Specht, S., I.2.295
 Speer, R., I.1.145
 Speirs, J., III.12.545
 Spence, S.M., I.2.571
 Spillmann, A., II.8.739
 Staehelin, L.A., II.5.269, II.8.903
 Stankovic, Z., IV.20.875, IV.20.879,
 IV.20.887
 Steck, K., II.4.121
 Stehlik, D., II.7.619, II.7.623
 Steinmetz, D., II.7.607, II.8.855
 Steinmüller, K., III.12.557
 Steup, M., III.12.605, IV.15.99
 Stevenson, J.K., III.12.491
 Stilz, H.U., I.27,
 Stirewalt, V.L., II.4.1
 Stocker, J.W., III.12.529
 Stolz, B., II.8.809
 Strasser, R.J., I.2.555, I.2.567, I.2.615,
 II.6.503
 Strelow, F., III.9.125, III.9.157
 Streubel, M., III.12.483
 Streusand, V.J., I.2.599,
 Strid, Å., III.9.23, III.9.173, III.9.177,
 III.9.181
 Strotmann, H., III.9.121, III.9.141
 Struck, A., III.13.691
 Strümper, P., III.9.77

- Struve, W.S., II.5.325
 Strzałka, K., II.8.887
 Sturgis, J.N., II.4.57
 Styring, S., II.6.349, II.6.405, II.6.423
 Sugiura, M., III.12.469, III.13.767
 Sumida, S., III.11.391
 Sundblad, L.-G., IV.18.441
 Sundby, C., II.8.759
 Sundström, V., II.4.153, II.4.173
 Suter, F., II.4.97
 Sutton, B.J., IV.16.147
 Suzuki, E., IV.18.467
 Suzuki, K., II.7.587, IV.18.505, IV.18.509
 Suzuki, M., I.3.801
 Svendsen, I., II.7.679
 Svensson, P., II.5.301, II.8.831, II.8.839,
 II.8.923
 Szczepaniak, A., III.10.221, III.10.255
- Tae, G.-S., III.10.221
 Taguchi, A.K., III.12.529
 Taira, T., IV.16.199
 Takabe, T., III.13.719
 Takahashi, E., I.1.169
 Takahashi, M., I.2.495, I.3.757
 Takahashi, Y., I.2.311, I.2.499
 Takaichi, S., II.4.49,
 Takamiya, K.-I., III.10.315, IV.15.91
 Takano, Y., II.7.587
 Takeda, T., IV.19.615
 Takenaka, A., IV.17.299
 Takio, K., I.2.347
 Tamai, N., II.4.193, II.5.309
 Tamura, N., I.3.917
 Tandeau de Marsac, N., II.4.101
 Tang, C.-Q., I.2.335
 Tanguay, N.A., II.7.639
 Taoka, S., I.2.547
 Tappermann, P., I.1.137
 Tarchevsky, I.A., IV.17.429, IV.19.801
 Tardieu, F., IV.19.737
 Tasumi, M., I.1.73,
 Taylor, M., III.13.759
 Tchuinmogne, S.J., III.14.873
 Telfer, A., I.2.419, I.2.431, I.2.435
 Terakado, K., II.7.587
 Terao, T., II.8.859
 Terashima, I., IV.17.299
 Tetenkin, V.L., I.2.427
 Theiler, R., II.4.129, III.10.259
 Thibodeau, D., I.1.85
 Thiel, T., I.2.291
- Thomson, W.W., II.8.803
 Thornber, J.P., II.5.261, II.5.285
 Thumauer, M.C., I.1.181
 Tiede, D.M., I.1.129,
 Timmerhaus, M., II.8.771
 Timmins, P.A., II.7.563
 Timpmann, K., II.4.157
 Ting, C.S., IV.19.627
 Tingyun, K., IV.19.647
 Titov, A.F., IV.19.651
 Tjus, S., II.7.583
 Todd, C., III.12.561
 Tokito, M.K., III.10.231
 Toner, W., II.7.615
 Tongzhu, L., IV.19.647
 Torgersen, Y., IV.20.935
 Toropygina, O.A., II.4.81
 Tourikas, C., III.9.173
 Tran-Anh, T., III.9.125, III.9.157
 Trautman, J.K., II.5.289, II.5.293
 Trebst, A., I.2.217
 Tremolieres, A., II.5.277
 Trissl, H.-W., II.5.305, II.5.329
 Trujillo, I., IV.19.713
 Tschopp, P., II.4.77,
 Tsinoremas, N.F., II.8.919
 Tso, J., I.3.953
 Tsugita, A., IV.16.167
 Tsujita, M.J., IV.15.35
 Turina, M.P., III.9.85
 Tyystjärvi, E., II.6.439, II.6.459
 Tzinas, G., III.13.803
- Uehara, A., I.3.801
 Uehara, K., II.5.241
 Ueno, O., IV.20.867
 Ullrich, J., I.1.145
 Urbanová, M., II.8.821
 Usuda, H., IV.16.199, IV.16.255
 Uusitalo, J., IV.18.517, IV.18.521,
 IV.18.525, IV.18.529, IV.18.533
- Vacek, K., II.4.205, II.8.821, II.8.825
 Vacha, M., II.4.205
 Vadell, J., IV.19.729
 Val, J., II.6.499, IV.19.679, IV.19.765
 Valcke, R., III.13.775
 Valle, E.M., IV.16.227
 Vallejos, R.H., II.8.871
 Van 't Veld, A.A., II.8.755
 Van Amerongen, H., I.2.279, II.4.113
 Van Arkel, G., III.12.533

- Van Berkel, J., III.12.605
 Van de Meent, E.J., II.4.145
 Van de Ven, M., I.2.459,
 Van der Est, A.J., II.7.619, II.7.623
 Van der Staay, G.W.M., II.4.201
 Van der Vies, S., III.13.671
 Van Ginkel, G., II.5.337, II.5.345, II.8.755
 Van Gorkom, H.J., I.3.693, I.3.805
 Van Grondelle, R., I.2.279, II.4.113, II.4.133,
 II.4.137, II.4.141, II.4.153, II.4.161,
 II.4.173
 Van Gurp, M., II.4.113, II.5.337, II.5.345
 Van Haeringen, B., II.4.113, II.4.141
 Van Hasselt, P.R., IV.17.389, IV.20.931
 Van Hove, L.W.A., IV.19.611
 Van Ieperen, W., II.8.911
 Van Kan, P.J.M., II.4.185
 Van Kooten, O., IV.19.611
 Van Leeuwen, P.J., I.3.693
 Van Loven, K., III.13.775
 Van Mieghem, F.J.E., I.2.535
 Van Mourik, F., I.2.279, II.4.113, II.4.133,
 II.4.137, II.4.141
 Van Onckelen, H., III.13.775
 Van Vliet, P.H., III.9.213
 Van Wijk, K.J., IV.17.389
 Van Zandvoort, M., II.8.755
 Vandeloise, R., II.7.683
 Vandenbranden, S., III.9.149
 Vander Donckt, E., II.7.683
 Vänngård, T., I.3.749, I.3.753, III.10.319
 Vass, I., I.2.223, I.3.809
 Vassey, T.L., IV.19.549
 Vater, J., I.2.355, III.11.373
 Vázquez, M.J., IV.15.47, IV.17.397
 Velasco, G.R., IV.15.47, IV.17.397
 Veljović, S., IV.16.215, IV.19.725
 Venturoli, G., III.9.85
 Vermaas, W., I.2.231, I.2.359, I.2.667
 Vermiglio, A., III.10.247
 Vernotte, C., I.2.543
 Versluis, W., II.8.883
 Vesk, M., II.5.333
 Vidal, D., IV.19.781
 Viil, J., III.11.415
 Violette, C.A., I.1.105
 Virgin, I., II.6.349, II.6.423, III.12.537
 Virolainen, A.A., IV.19.651
 Visscher, K.J., II.4.153
 Visschers, R.W., II.4.133
 Vitseva, O.I., III.9.69
 Vivekanandan, M., IV.20.903
 Volk, M., I.1.133, I.1.153
 Volovik, O.I., II.8.791, II.8.795
 Volz, E., III.10.275
 Von Heijne, G., III.13.653
 Von Schütz, J.U., I.1.145
 Von Wettstein, D., III.13.783
 Vonk, C.A., II.4.137
 Vorst, O., III.12.573
 Vos, M.H., I.3.693, I.3.805
 Voss, B., IV.16.171
 Vredenberg, W.J., II.8.883, II.8.891,
 II.8.911, III.9.213, IV.19.611
 Wachtveitl, J., I.1.197, I.1.201
 Wacker, T., II.4.121
 Wacker, U., I.3.869,
 Wada, K., II.7.571
 Waggoner, C.M., I.3.739,
 Wagner, R., III.9.53, III.9.81, III.9.93
 Waldburger-Schlapp, M., IV.17.341
 Waldo, G.S., I.3.797
 Walker, D.A., II.6.507
 Walmsley, J., III.13.687
 Walter, G., III.14.885
 Walters, R.G., I.2.631
 Walz, D., II.8.809
 Wälzlein, G., I.2.295
 Wan, J., II.7.695
 Wang, J., II.4.17
 Wang, K.-B., II.5.281, IV.19.667
 Wang, W.Q., II.6.515
 Wang, Z., III.10.291
 Warden, J.T., II.7.635
 Warncke, K., I.1.157
 Warshel, A., I.1.31,
 Wasielewski, M.R., I.1.129, I.2.451
 Watanabe, T., I.3.885, II.4.109
 Webb, R., I.2.255
 Webber, A.N., II.7.575, III.12.461
 Wedel, N., II.5.253
 Weiler, E.W., IV.15.99
 Weinberg, D., III.13.811
 Weinzettel, A., II.8.827
 Weis, E., I.2.563, II.8.771, IV.16.171,
 IV.17.307
 Weisbeek, P., III.12.533, III.12.573
 Weiss, C., IV.19.769
 Weiss, D., IV.17.417
 Weiss, E., I.2.663
 Weiss, U., IV.19.769
 Wellington, C.L., III.12.453
 Welte, W., II.4.121, II.7.563

- Wen, H., **II**.7.699
 Weng, J.-M., **III**.11.347
 Westerhuis, W.H.J., **II**.4.129
 Westhoff, P., **III**.12.483
 Whelan, J., **III**.13.815
 White, I.R., **II**.8.767
 White, L.A., **I**.2.671
 Whitelegge, J., **I**.2.603
 Whitmarsh, J., **I**.2.383
 Widholm, J.M., **IV**.18.475
 Widler, W., **II**.4.89
 Wigge, B., **IV**.15.9, **IV**.15.59
 Wild, A., **II**.6.377, **II**.8.827
 Wilhelm, C., **II**.4.105, **II**.8.943
 Wilhelmová, N., **II**.8.931
 Willey, D.L., **III**.12.461
 Williams, J.G.K., **IV**.18.471
 Williams, J.P., **IV**.17.313
 Williams, M.L., **II**.6.451, **II**.6.455
 Williamson, D.L., **I**.2.575
 Wingsle, G., **IV**.19.805
 Winterberg, A., **IV**.19.785
 Witt, H.T., **I**.3.745, **I**.3.837, **II**.7.547
 Witt, I., **II**.7.547
 Wolf, H.C., **I**.1.145
 Wolfe, D.W., **IV**.19.627
 Wollman, E., **IV**.16.159
 Wollman, F.-A., **III**.13.715, **IV**.15.43
 Wolosiuk, R.A., **IV**.16.195
 Won, Y., **I**.1.93
 Wonders, J.H.A.M., **II**.8.891
 Wood, W.F., **II**.6.385
 Woodbury, N.W., **II**.4.165, **II**.4.169,
III.12.529
 Woodrow, L., **IV**.19.809
 Wraight, C.A., **I**.1.165, **I**.1.169
 Wright, D.P., **IV**.16.223
 Wu, B., **II**.5.277
 Wu, G.-Y., **III**.11.339, **III**.11.403
 Wu, X.-Y., **III**.11.339, **III**.11.403
 Wünschmann, G., **II**.6.401
 Wydrzynski, T., **I**.3.749
 Wynn, R.M., **II**.7.575

 Xu, C.-H., **II**.5.281, **IV**.19.667
 Xu, R.-B., **III**.11.377
 Xu, Y.-N., **II**.7.695, **III**.11.403

 Yachandra, V.K., **I**.3.769, **I**.3.789
 Yalovsky, S., **III**.13.661
 Yamamoto, H.Y., **II**.6.495
 Yamamoto, K., **II**.8.927
 Yamamoto, Y., **I**.2.287, **III**.13.771
 Yamashita, J., **III**.12.517
 Yamashita, T., **I**.3.913
 Yamazaki, I., **II**.4.193, **II**.5.309
 Yanai, N., **II**.7.587
 Yang, D.H., **IV**.19.667
 Yang, L., **I**.1.177
 Yang, S., **II**.5.325
 Yang, Y., **IV**.15.99
 Yano, K., **IV**.16.167
 Yarin, A.U., **IV**.17.429
 Yeh, S., **I**.3.821
 Yepiz-Plascencia, G., **III**.12.491
 Yerkes, C.T., **II**.6.381
 Ying, W.-L., **II**.7.695
 Yocum, C.F., **I**.2.239, **I**.2.263, **I**.2.267,
I.2.539, **I**.2.643, **I**.3.729, **I**.3.739, **I**.3.797
 Yokota, A., **III**.11.391, **IV**.16.199, **IV**.19.615
 Yokoyama, E.-I., **II**.7.655
 Yordanov, I.T., **IV**.19.699
 Yoshihira, T., **II**.8.927
 Young, A.J., **IV**.15.15, **IV**.19.587, **IV**.19.595
 Young, D.A., **III**.13.707
 Youvan, D.C., **I**.1.53, **I**.1.137, **I**.1.149,,
I.1.153
 Youze, L., **III**.9.101
 Yu, S.-G., **II**.8.835, **II**.8.839, **II**.8.843
 Yun, C.-H., **III**.10.263
 Yushu, Z., **I**.1.205
 Yuzhu, G., **IV**.18.497

 Zatezalo, S., **IV**.20.875, **IV**.20.887,
IV.20.879
 Zeroni, M., **IV**.15.55
 Zhang, G.-Z., **II**.5.281
 Zhang, Q.-D., **I**.2.335
 Zhang, Z.H., **III**.12.637
 Zhao, F.H., **IV**.19.667
 Zhao, J., **II**.6.401
 Zharmukhamedov, S.K., **I**.2.247
 Zhenglian, Z., **I**.1.205
 Zhengping, M., **III**.9.101
 Zhenlin, Z., **IV**.18.497
 Zhong, W., **IV**.18.497
 Zhou, F.-H., **II**.5.281
 Zhou, J., **II**.4.1
 Zhuravel, T.T., **II**.8.795
 Ziegler-Jöns, A., **IV**.19.607
 Zilber, A., **II**.7.575
 Zilberstein, A., **III**.11.411
 Zilinskas, B.A., **II**.4.125
 Zimmermann, J.-L., **I**.3.713, **I**.3.789

Zinth, W., I.1.27,

Znak, N., IV.20.915

Zuber, H., II.4.61, II.4.89, II.4.93, II.4.97,

II.7.591

Zubkova, H., IV.15.103

Zucchelli, G., II.5.313, II.5.317

Zuo, B.-Y., I.2.335

Bayerische
Staatsbibliothek
München