

K.C. Smith

AMERICAN SOCIETY  
FOR PHOTOBIOLOGY

*Program and Abstracts*

FIRST ANNUAL MEETING

JUNE 10-14, 1973

LIDO BILTMORE CLUB

SARASOTA, FLORIDA

184 Members  
32 Non-Members  
24 Students

~ 180 persons

$\Sigma = 240$

AMERICAN SOCIETY FOR PHOTOBIOLOGY

PROGRAM AND ABSTRACTS

First Annual Meeting

June 10-14, 1973

Sarasota, Florida

Lido Biltmore Club

124 contributed papers

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## ACKNOWLEDGMENTS

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\*\*\*\*\*  
A contract from the National Science Foundation awarded in 1972 to the U. S. National Commission for Photobiology (National Academy of Science/ National Research Council) permitted the planning and initiation of the American Society for Photobiology. ✓



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Monday Morning, June 11 - 9:00 am  
Symposium I: MAM-A - DINING ROOM

LIGHT AND BIOLOGICAL RHYTHMS

Beatrice M. Sweeney, Chairman  
University of California  
Santa Barbara

MAM-A1 - 9:00 am  
THE PHOTSENSITIVITY OF DROSOPHILA'S CIRCADIAN TIME SENSE.  
ARTHUR T. WINFREE  
Purdue University

MAM-A2 - 10:00 am  
THE SPECTRAL SENSITIVITY OF CIRCADIAN RHYTHMS.  
RUTH HALABAN  
State University of New York

MAM-A3 - 11:00 am  
CIRCADIAN RHYTHMS IN INSECTS: THEIR RELEVANCE TO PHOTOPERIODISM.  
JAMES W. TRUMAN  
Harvard University

PHOTOSENSITIZATION

M. J. Ashwood-Smith, Chairman  
University of Victoria

MAM-B1 - 9:00 am  
REDUCTONE EFFECT IN E. COLI SUBMITTED TO PHOTODYNAMIC ACTION WITH METHYLENE BLUE.  
L. R. CALDAS, S. MENEZES\* AND R. ALCANTARA GOMES\*  
Institute of Biophysics, Rio de Janeiro

*Cancel*  
~~MAM-B2 - 9:15 am  
POSSIBLE METABOLIC CONTROL BY DIRECTED IN VIVO MOTION.  
SYDNEY J. WEBB  
University of Saskatchewan~~

MAM-B3 - 9:30 am  
THE PHOTSENSITIZED IMMOBILIZATION OF A. SALINA NAUPLII BY POLYNUCLEAR AROMATIC HYDROCARBONS. A CORRELATION OF CARCINOGENIC AND PHOTODYNAMIC ACTIVITIES.  
DAVID D. MORGAN, DAVID WARSHAWSKY AND FLORENCE MILES\*  
University of Cincinnati

MAM-B4 - 9:45 am  
PHOTOOXIDATION OF SNAKE VENOM ENZYMES SENSITIZED BY DYES.  
R. STRAIGHT, P. GARN\*, AND J. GLENN\*  
Veterans Administration Hospital, Salt Lake City

MAM-B5 - 10:00 am  
DOSE DEPENDENT CHANGES IN THE SEDIMENTATION CHARACTERISTICS OF BACTERIAL DNA PRODUCED, IN VIVO, BY NEAR ULTRA-VIOLET IRRADIATION (365nm) AND 8-METHOXYPSORALEN.  
M. J. ASHWOOD-SMITH AND ELIZABETH GRANT\*  
University of Victoria

MAM-B6 - 10:15 am  
TRYPTOPHAN PHOTOPRODUCT EFFECTS ON GENETIC RECOMBINATION IN BACTERIA.  
F. LANDA\* AND A. EISENSTARK  
University of Missouri

MAM-B7 - 10:30 am  
PHOTORESTITUTION OF BIOLOGICALLY-USEFUL COLLAGEN GELS.  
E. B. MASUROVSKY AND E. R. PETERSON\*  
Albert Einstein College of Medicine

MAM-B8 - 10:45 am  
ENHANCEMENT OF SELENIUM PHOTOVOLTAISM BY TREATMENT WITH PORPHYRIN DERIVATIVES.  
A. D. ADLER AND V. GREENFIELD\*  
New England Institute

MAM-B9 - 11:00 am  
THE PHOTSENSITIZED OXIDATION OF ALPHA-LIPOIC ACID.  
R. W. MURRAY, F. E. STARY\*, AND S. L. JINDAL\*  
University of Missouri-St. Louis

Monday Morning, June 11 - MAM-B  
CONTINUED

MAM-B10 - 11:15 am  
RED BLOOD CELL LYSIS INDUCED BY A PRODUCT OF SINGLET OXYGEN AND CHOLESTEROL.  
T. YAMANE AND A. A. LAMOLA  
Bell Telephone Laboratories

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- NOTES -



PHOTOSYNTHESIS I

Lawrence Bogorad, Chairman  
Harvard University

MAM-C1 - 9:00 am  
CHLOROPLAST STRUCTURE AND DEVELOPMENT.  
LAWRENCE BOGORAD  
Harvard University

MAM-C2 - 9:30 am  
ORGANIZATION OF PROTEINS WITHIN THE CHLOROPLAST MEMBRANE.  
S. M. KLEIN and L. P. VERNON  
Brigham Young University

MAM-C3 - 9:45 am  
EMISSION KINETICS OF PHOTOSYSTEM I AND PHOTOSYSTEM II FLUORESCENCE ON A PICOSECOND TIME SCALE.  
M. SEIBERT and R. R. ALFANO\*  
GTE Laboratories Inc. and City College of New York

MAM-C4 - 10:00 am  
ESR SIGNAL II: THE EFFECT OF VARIOUS CHEMICAL AND PHYSICAL TREATMENTS.  
M. C. BEINFELD  
Washington University Medical School

MAM-C5 - 10:15 am  
THE RELATION OF SIGNAL 2 TO ELECTRON TRANSPORT IN PHOTOSYSTEM 2 IN ESR STUDIES OF SPINACH CHLOROPLASTS.  
J. T. WARDEN, JR.\* and J. R. BOLTON  
University of Western Ontario

MAM-C6 - 10:30 am  
MECHANISM FOR LIGHT INDUCED LOWERING OF FLUORESCENCE INTENSITY IN PHOTOSYNTHETIC ORGANISMS AT LOW TEMPERATURE.  
R. JACOBS and S. BRODY  
New York University

MAM-C7 - 10:45 am  
THE TIME COURSE OF LIGHT EMISSION OF SCENEDESMUS OBLIQUUS.  
CHR. HOLZAPFEL and A. HAUG  
Michigan State University (Introduced by E. Kuntz)

MAM-C8 - 11:00 am  
QUANTITATIVE DETERMINATION OF IN VIVO PIGMENT ORIENTATION BY LIGHT SCATTERING.  
R. VAN METTER, C. E. SWENBERG and N. GEACINTOV  
New York University

Monday Morning, June 11 - MAM-C  
CONTINUED

MAM-C9 - 11:15 am  
A SCANNING DOUBLE BEAM SPECTROPHOTOMETER.  
GEOFFREY HIND and JERRY RAPP\*  
Brookhaven National Laboratory

MAM-C10 - 11:30 am  
ON THE STATE 1 - STATE 2 PHENOMENON OF PHOTOSYNTHESIS.  
R. T. WANG and J. MYERS  
University of Texas at Austin

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- NOTES -

Monday Afternoon, June 11 - 12:15 pm  
PHOTOBIOLOGY SCHOOL  
Session I: MPM-A - CARD ROOM

MPM-A

12:15 pm - 1:45 pm  
THE SCOPE OF PHOTOBIOLOGY.  
JOHN SPIKES  
University of Utah

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12:15 pm

COUNCIL MEETING  
(Old and New Council)

TV ROOM

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- NOTES -

Monday Afternoon, June 11 - 4:00 pm  
Lecture I: MPM-B - DINING ROOM

MPM-B

4:00 pm - 5:00 pm  
THE ULTRAVIOLET WORLD OF INSECTS.  
TIMOTHY H. GOLDSMITH  
Yale University

*Abrahamson*

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- NOTES -

Monday Afternoon, June 11 - 5:15 pm  
Symposium II: MPM-C - DINING ROOM

COMPARATIVE ASPECTS OF PHOTORECEPTOR MEMBRANES

Edwin W. Abrahamson, Chairman  
Case Western Reserve

MPM-C1 - 5:15 pm  
STRUCTURE OF VISUAL PIGMENT MEMBRANES.  
C. R. WORTHINGTON  
Carnegie-Mellon University

MPM-C2 - 6:00 pm  
LOCALIZATION AND FUNCTION OF RHODOPSINS IN TWO PHOTORECEPTOR MEMBRANES.  
WALTER STOECKENIUS  
University of California, San Francisco

MPM-C3 - 6:45 pm  
THE PHOTOSYNTHETIC MEMBRANE.  
RODERIC B. PARK  
University of California, Berkeley

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- NOTES -

REPAIR OF DAMAGED DNA

Claud S. Rupert, Chairman  
University of Texas at Dallas

MPM-D1 - 5:15 pm  
EXCISION REPAIR OF BASE DAMAGE.  
RONALD D. LEY  
Argonne National Laboratory

MPM-D2 - 6:00 pm  
POST-REPLICATION REPAIR OF NUCLEOTIDE DAMAGE  
W. DEAN RUPP  
Yale University School of Medicine

MPM-D3 - 6:45 pm  
MECHANISMS FOR THE REPAIR OF DNA CHAIN BREAKS.  
DAVID A. YOUNGS  
Stanford University School of Medicine

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- NOTES -



Tuesday Morning, June 12 - 8:30 am  
Lecture II: TAM-A - DINING ROOM

TAM-A

8:30 am - 9:30 am  
BEHAVIORAL AND BIOCHEMICAL RESPONSES  
TO UV RADIATION.  
ARTHUR C. GIESE  
Stanford University

*KCS reads Giese paper*

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- NOTES -



SOLAR ENERGY CONVERSION

In Honor of FARRINGTON DANIELS, SR.

Alexander Hollaender, Chairman  
Oak Ridge National Laboratory

9:45 am Chairman's Introduction

TAM-B1 - 10:15 am  
SURVEY OF BIOLOGICAL AND PHYSICAL SCHEMES FOR ENERGY CONVERSION.  
RODERICK K. CLAYTON  
Cornell University

TAM-B2 - 11:00 am  
BIOPHOTOLYSIS OF WATER TO HYDROGEN AND OXYGEN.  
L. O. KRAMPITZ  
Case Western Reserve University

TAM-B3 - 11:45 am  
ENGINEERING SYSTEMS FOR BIOLOGICAL ENERGY CONVERSION PROCESSES.  
LLOYD HERWIG  
National Science Foundation (RANN)

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- NOTES -

UV RADIATION EFFECTS I  
(Bacteria and Mammalian Cells)

C. D. Lytle, Chairman  
Bureau of Radiological Health

TAM-C1 - 9:45 am

THE CONTROL OF THREE BRANCHES OF THE EXCISION REPAIR PROCESS IN ESCHERICHIA COLI K-12 BY THE polA, dnaE, AND exrA GENES.

DAVID A. YOUNGS and KENDRIC C. SMITH  
Stanford University School of Medicine

TAM-C2 - 10:00 am

SENSITIZATION OF ESCHERICHIA COLI K-12 CELLS TO <sup>V</sup>UV IRRADIATION BY 2,4-DINITROPHENOL.

EMMANUEL VAN DER SCHUEREN and KENDRIC C. SMITH  
Stanford University School of Medicine

TAM-C3 - 10:15 am

MEMBRANE CHANGES IN UV-IRRADIATED E. COLI B/r CELLS THAT DIE OF RESPIRATORY FAILURE.

P. A. SWENSON and R. L. SCHENLEY  
Oak Ridge National Laboratory

TAM-C4 - 10:30 am

ACTION SPECTRA FOR THE KILLING OF UV-SENSITIVE SPORES OF BACILLUS SUBTILIS.

N. MUNAKATA\*, LYNN MARPLE\*, T. T. MENG\*, and C. S. RUPERT  
University of Texas at Dallas

TAM-C5 - 10:45 am

RECOVERY IN UV SURVIVAL CURVES.

A. E. S. GREEN, J. H. MILLER and E. C. POLLARD  
University of Florida (Introduced by D. Billen)

TAM-C6 - 11:00 am

TEMPERATURE DEPENDENCE OF ULTRAVIOLET RADIATION SENSITIVITY OF CLEAN, DRY T-1 BACTERIOPHAGE: RELATION TO A HOST-REPAIRABLE COMPONENT OF IONIZING RADIATION DIRECT ACTION.

D. J. FLUKE  
Duke University

TAM-C7 - 11:15 am

DIFFERENT GENETIC FORMS OF XERODERMA PIGMENTOSUM.

K. H. KRAEMER\*, H. G. COON\* and J. H. ROBBINS  
National Cancer Institute

TAM-C8 - 11:30 am

EFFECT OF CELL PHYSIOLOGICAL CONDITION ON MAMMALIAN HOST CELL REACTIVATION.

C. D. LYTLE, S. G. BENANE\*, and C. F. BLACKMAN  
Bureau of Radiological Health

Tuesday Morning, June 12 - TAM-C  
CONTINUED

TAM-C9 - 11:45 am  
ULTRAVIOLET AND X-RAY ENHANCED REACTIVATION OF HERPES SIMPLEX VIRUS IN NORMAL  
AND MALIGNANT RAT AND HUMAN CELLS.  
K. B. HELLMAN, K. HAYNES\*, C. D. LYTLE and L. BOCKSTAHLER  
Bureau of Radiological Health

TAM-C10 - 12:00 pm  
CELLULAR REPAIR OF ULTRAVIOLET IRRADIATED ADENOVIRUS-2 IN NORMAN HUMAN FIBROBLASTS.  
RUFUS S. DAY, III  
National Cancer Institute

TAM-C11 - 12:15 pm  
PROTECTIVE INTERACTION BETWEEN FLAVIN AND UV-IRRADIATED DNA.  
D. ROTH  
New York University Medical School

TAM-C12 - 12:30 pm  
METABOLIC MAPS AND SUBSTRATE IRRADIATION TIME.  
RALPH L. SHERMAN, SORIN COMOROSAN\* and WANG H. YEE\*  
J. M. Richards Laboratory

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- NOTES -

VISION

M. J. Jaffe, Chairman  
Ohio University

TAM-D1 - 9:45 am  
THE ISOLATED, PERFUSED EYE: A USEFUL TOOL IN PHARMACOLOGY, PHOTOBIOLOGY AND PHYSIOLOGY.  
ANTHONY L. MARCHESE and ALEXANDER H. FRIEDMAN  
Loyola University Stritch School of Medicine

TAM-D2 - 10:00 am  
ACTION SPECTRUM AND LIGHT ADAPTATION OF THE LIGHT-INDUCED MEMBRANE HYPERPOLARIZATION  
IN APLYSIA L-10 NEURONS.  
M. C. ANDRESEN\*, F. G. SWEENEY\* and C. L. BRANDT  
California State University, San Diego

TAM-D3 - 10:15 am  
THE EFFECTS OF LIGHT ON THE RESPIRATION OF VERTEBRATE AND INVERTEBRATE RETINAS WITH  
SPECIAL REFERENCE TO THE EFFECTS OF ACETYLCHOLINE AND GAMMA-AMINOBUTYRIC ACID ON THE  
FROG RETINA.  
M. J. JAFFE and E. L. PAUTLER\*  
Ohio University and Colorado State University

TAM-D4 - 10:30 am  
AN EXPLANATION FOR THE PURKINJE SHIFT IN FISHES.  
F. W. MUNZ and W. M. McFARLAND  
University of Oregon and Cornell University

TAM-D5 - 10:45 am  
CHANGES IN TROUT VISUAL PIGMENTS.  
D. M. ALLEN and W. N. McFARLAND  
University of Michigan and Cornell University

TAM-D6 - 11:00 am  
THE EFFECT OF TEMPERATURE ON RHODOPSIN-PORPHYROPSIN RATIOS IN PAIRED PIGMENT FISHES.  
WILLIAM N. McFARLAND and DONALD M. ALLEN  
Cornell University and University of Michigan

TAM-D7 - 11:15 am  
STUDIES ON THE MOLECULAR ORGANIZATION OF ROD OUTER SEGMENT MEMBRANES.  
EDWARD DRATZ, RODGER RAUBACH, PETER NEMES\*, JANINE PERLMAN\*, KENDALL MADDEN\* and  
STEPHEN SCHWARTZ\*  
University of California, Santa Cruz

TAM-D8 - 11:30 am  
LIGHT EVOKED RESPONSE FROM THE EPIPHYSIS OF CHICKS.  
D. I. HAMASAKI  
University of Miami

Tuesday Morning, June 12 - TAM-D  
CONTINUED

TAM-D9 - 11:45 am  
AN EXPLICIT MODEL FOR THE ELECTRICAL RESPONSE OF THE ROD.  
VIC ELIAS\* and EDWARD A. DRATZ  
University of California, Santa Cruz

TAM-D10 - 12:00 pm  
ION MOVEMENTS IN VERTEBRATE PHOTORECEPTORS IN THE DARK AND UPON LIGHT EXPOSURE.  
W. T. MASON, Y. F. LEE\*, R. S. FAGER and E. W. ABRAHAMSON  
Case Western Reserve University

TAM-D11 - 12:15 pm  
ATTACK OF VERTEBRATE AND INVERTEBRATE VISUAL PIGMENTS BY SCHIFF BASE ATTACKING  
REAGENTS.  
ROGER S. FAGER, MICHAEL KANDEL\*, STUART GOLDMAN\* and E. W. ABRAHAMSON  
Case Western Reserve University

TAM-D12 - 12:30 pm  
PHYSICOCHEMICAL PROPERTIES OF VERTEBRATE AND INVERTEBRATE PHOTORECEPTOR MEMBRANES.  
W. T. MASON, R. S. FAGER and E. W. ABRAHAMSON  
Case Western Reserve University

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- NOTES -

Tuesday Afternoon, June 12 - 12:45 pm  
PHOTOBIOLOGY SCHOOL  
Session II: TPM-A - CARD ROOM

TPM-A

12:45 pm - 2:00 pm  
THE MOLECULAR DESCRIPTION OF  
BIOLOGICAL CHROMOSOMES.  
AARON LEWIS *Phurcs*  
Cornell University

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12:45 pm

EDITORIAL BOARD LUNCHEON

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- NOTES -

Tuesday Afternoon, June 12 - 4:00 pm  
Lecture 11: TPM-B - DINING ROOM

TPM-B

4:00 pm - 5:00 pm  
THE ROLE OF LIGHT IN HUMAN  
ENVIRONMENT.  
THOMAS R. C. SISSON  
Temple University School of Medicine

*Urboch*

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- NOTES -

Tuesday Afternoon, June 12 - 5:15 pm  
Symposium V: TPM-C - DINING ROOM

THE VISUAL PIGMENTS

Angelo A. Lamola, Chairman  
Bell Telephone Laboratories

TPM-C1 - 5:15 pm  
BIOSYNTHESIS OF RHODOPSIN.  
PAUL J. O'BRIEN  
Eye Institute (NIH)

TPM-C2 - 6:00 pm  
PHOTOBIOLOGY OF VISUAL PIGMENTS.  
C. D. B. BRIDGES  
N. Y. U. Medical Center

TPM-C3 - 6:45 pm  
VISUAL CYCLE IN VERTEBRATES.  
S. L. BONTING  
University of Nymegen, The Netherlands

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- NOTES -



ENVIRONMENTAL PHOTOBIOLOGY/SPECTROSCOPY

*Song*  
~~Richard Klein~~, Chairman  
~~University of Vermont~~

TPM-D1 - 5:15 pm  
PRACTICAL APPLICATION OF LIGHT AND COLOR TO HUMAN ENVIRONMENTS.  
FABER BIRREN  
Color Consultant

? TPM-D2 - 5:30 pm  
A FLUX DAY--OBSERVATIONS ON FACTORS INFLUENCING THE LIGHT ENVIRONMENT OF INFANTS.  
JEROLD LUCEY, THOMAS WOLK, JAMES BOTTOGGI and RICHARD KLEIN  
~~University of Vermont~~

TPM-D3 - 5:45 pm  
INFLUENCE OF LIGHT INTENSITY AND PHOTOPERIOD ON THE REPRODUCTIVE SYSTEM OF HAMSTERS.  
ROGER A. HOFFMAN  
Colgate University

TPM-D4 - 6:00 pm  
LIGHT INTENSITY AND SPECTRAL REQUIREMENTS FOR THE PHOTOSEXUAL RESPONSE IN QUAIL.  
T. OISHI\* and J. K. LAUBER  
University of Alberta

TPM-D5 - 6:15 pm  
RESPONSE OF DOGS TO COMMERCIALY AVAILABLE LIGHT SOURCES AS A SOLE SOURCE OF ILLUMINATION.  
A. L. ROGERS, J. W. TEMPLETON\* and J. COTTINGHAM\*  
University of Oregon Medical School and Portland General Electric Company

TPM-D6 - 6:30 pm  
COMPARISON BETWEEN PHOTOREACTIVITIES OF CARCINOGENIC BENZOPYRENE AND SKIN-SENSITIZING COUMARINS.  
P. S. SONG, T. A. MOORE\* and W. W. MANTULIN  
Texas Tech University

TPM-D7 - 6:45 pm  
A MODEL FOR THE LUMINESCENCE OF LYSOZYMES AND LACTALBUMINS.  
J. W. LONGWORTH and V. L. KOENIG\*  
Oak Ridge National Laboratory

TPM-D8 - 7:00 pm  
THE BEHAVIOR OF ACRIDINE ORANGE-CHONDROITIN SULFATE-A COMPLEXES.  
J. M. MENTER, S. S. WEST, P. GENTILCORE, R. S. FAGER, G. P. P. KUNTZ and E. W. ABRAHAMSON  
University of Alabama and Case Western Reserve University

Tuesday Afternoon, June 12 - TPM-D  
CONTINUED

TPM-D9 - 7:15 pm

TRYPTOPHAN FLUORESCENCE AND FMN BINDING IN AZOTOBACTER FLAVODOXIN.

L. ANDREWS\*, M. MacKNIGHT, J. RYAN\* and G. TOLLIN

University of Arizona

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- NOTES -

UV RADIATION EFFECTS II  
(Near UV)

H. Gaston Griggs, Chairman  
Vanderbilt University

TPM-E1 - 5:15 pm  
EVIDENCE FOR A ROLE OF UV-INDUCED PYRIMIDINE DIMERS IN MALIGNANT TRANSFORMATION.  
R. W. HART and R. B. SETLOW  
Oak Ridge National Laboratory

TPM-E2 - 5:30 pm  
MODIFICATION OF RADIATION RESPONSE BY TREATMENT WITH CAFFEINE COMBINED WITH CROTON OIL COMPONENTS OR TOBACCO RELATED SUBSTANCES.  
JOHN CALKINS  
University of Kentucky

TPM-E3 - 5:45 pm  
STUDIES ON PHOTOREACTIVATION OF ULTRAVIOLET EFFECTS IN SYNCHRONOUS CULTURES OF G1 XENOPUS CELLS.  
H. GASTON GRIGGS, MICHAEL A. BENDER\* and PAMELA WALKER\*  
Vanderbilt University

TPM-E4 - 6:00 pm  
SURVIVAL CURVES AND RADIATION REPAIR OF BLUE-GREEN ALGAL VIRUSES.  
M. P. KRAUS  
University of Delaware

TPM-E5 - 6:15 pm  
NEAR UV-INDUCED OCULAR CHANGES IN MICE.  
SEYMOUR ZIGMAN  
University of Rochester

TPM-E6 - 6:30 pm  
BIOLOGICAL CONSEQUENCES OF DAMAGE TO REPAIR SYSTEMS BY 365 nm RADIATION.  
R. B. WEBB and R. M. TYRRELL\*  
Argonne National Laboratory

TPM-E7 - 6:45 pm  
THE EFFECT OF 365 nm RADIATION ON REPAIR EFFICIENCY IN BACTERIA.  
R. M. TYRRELL and R. B. WEBB  
Argonne National Laboratory (Introduced by R. D. Ley)

TPM-E8 - 7:00 pm  
NEAR-ULTRAVIOLET MODIFICATION OF ESCHERICHIA COLI B UBIQUINONE IN VIVO AND IN VITRO.  
H. WERBIN, B. D. LAKCHAURA\* and J. JAGGER  
University of Texas at Dallas

TPM-E9 - 7:15 pm  
THE EFFECTS OF NEAR-ULTRAVIOLET RADIATION ON PHYSICAL AND GENETIC PROPERTIES OF TRANSFORMING DEOXYRIBONUCLEIC ACID.  
M. J. PEAK, J. G. PEAK

Tuesday Afternoon, June 12 - TPM-E  
CONTINUED

TPM-E9 - 7:15 pm

THE EFFECTS OF NEAR-ULTRAVIOLET RADIATION ON PHYSICAL AND GENETIC PROPERTIES  
OF TRANSFORMING DEOXYRIBONUCLEIC ACID.

M. J. PEAK, J. G. PEAK\* and R. B. WEBB

Argonne National Laboratory

~~TPM-E10 - 7:30 pm~~

~~DNA CROSS-LINKING IN CHINESE HAMSTER CELLS EXPOSED TO NEAR ULTRAVIOLET LIGHT IN  
THE PRESENCE OF PSORALEN.~~

~~E. BEN-HUR and M. M. ELKIND\*~~

~~Brookhaven National Laboratory and Hammersmith Hospital~~

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- NOTES -



Wednesday Morning, June 13 - 8:30 am  
Lecture IV: WAM-A - DINING ROOM

WAM-A

8:30 am - 9:30 am  
PHOTOCHEMISTRY IN PHOTOBIOLOGY,  
ANGELO A. LAMOLA  
Bell Telephone Laboratories

*Longworth*

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- NOTES -

PHOTOSYNTHETIC REACTION CENTERS

Leo P. Vernon, Chairman  
Brigham Young University

WAM-B1 - 9:45 am  
PRIMARY REACTIONS IN PHOTOSYNTHESIS.  
RODERICK K. CLAYTON  
Cornell University

WAM-B2 - 10:25 am  
STRUCTURAL AND FUNCTIONAL COMPONENTS IN BACTERIAL PHOTOSYNTHESIS.  
PAUL A. LOACH  
Northwestern University

WAM-B3 - 11:05 am  
SPECTROSCOPIC PROPERTIES OF REACTION CENTERS AND CHLOROPHYLL-PROTEINS.  
KENNETH SAVER  
University of California, Berkeley

WAM-B4 - 11:45 am  
NEW MODELS FOR ANTENNA AND REACTION CENTER CHLOROPHYLL.  
JOSEPH J. KATZ  
Argonne National Laboratory

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- NOTES -

MEDICAL PHOTOBIOLOGY

*Forbes*

~~Craig Wallis, Chairman  
Baylor College of Medicine~~

~~WAM-C1 - 9:45 am  
PHOTOBIOCHEMICAL TREATMENT OF VIRUS BACTERIAL AND FUNGAL INFECTIONS IN MAN.  
CRAIG WALLIS and JOSEPH L. MELNICK  
Baylor College of Medicine~~

WAM-C2 - 10:15 am  
CONTROLLED FOLLOW-UP STUDY OF LOW BIRTH WEIGHT INFANTS AT 4-6 YEARS OF AGE  
TREATED WITH PHOTOTHERAPY.  
JEROLD F. LUCEY, JEAN R. HEWITT, E. STANLEY EMERY, STEVEN GOLDSTEIN and SUSAN COLLINS  
University of Vermont

WAM-C3 - 10:30 am  
EFFECT OF PHOTOTHERAPY ON BLOOD LEVELS OF CORTISOL AND GROWTH HORMONE IN NEWBORN  
INFANTS.  
I. REZVANI\*, P. J. COLLIPP\*, G. ENTE and R. K. SHARMA\*  
Nassau County Medical Center

WAM-C4 - 10:45 am  
GENES, HAIR COLOR AND RESPONSES OF MOUSE EPIDERMAL MELANOCYTES TO UV: IMPLICATIONS  
FOR HUMAN PIGMENTATION.  
W. C. QUEVEDO, JR. and T. C. BIENIEKI\*  
Brown University

WAM-C5 - 11:00 am  
PHOTODYNAMIC THERAPY OF MALIGNANT TUMORS.  
IVAN DIAMOND, STEVEN F. GRANELLI\*, ANTONY F. McDONAGH, SURL NIELSEN\*, CHARLES B.  
WILSON\* and RICHARD JAENICKE\*  
University of California, San Francisco

WAM-C6 - 11:15 am  
EFFECTS OF LONG WAVE ULTRAVIOLET (320-400 nm) AND VISIBLE RADIATION (400-700 nm)  
ON NORMAL HUMAN SKIN.  
M. A. PATHAK, J. A. PARRISH, T. B. FITZPATRICK and K. JIMBOW\*  
Harvard Medical School

WAM-C7 - 11:30 am  
INFLUENCE OF LONG WAVE UV ON PHOTOCARCINOGENESIS.  
P. D. FORBES  
Temple University Health Sciences Center

WAM-C8 - 11:45 am  
PROTECTION AGAINST FORMATION OF CHOLESTEROL-DERIVED PHOTOPRODUCTS IN ULTRAVIOLET  
IRRADIATED SKIN.  
WAN-BANG LO\* and H. S. BLACK  
Baylor College of Medicine and Veterans Administration Hospital, Houston



Wednesday Morning, June 13 - WAM-C  
CONTINUED

WAM-C9 - 12:00 pm  
ULTRAVIOLET LASER IRRADIATION OF ALBINO GUINEA PIG SKIN.  
J. A. PARRISH, M. A. PATHAK, S. FINE\* and D. NEAL\*  
Harvard Medical School

WAM-C10 - 12:15 pm  
MODIFICATION OF CHEMICAL CARCINOGENESIS BY PHOTOTOXICITY AND PHOTOCHEMICAL  
DECOMPOSITION OF CARCINOGEN.  
R. E. DAVIES and H. A. DODGE\*  
Temple University Health Sciences Center

WAM-C11 - 12:30 pm  
STUDIES ON THE PHOTOCHEMICAL INTERACTION BETWEEN SKIN-PHOTOSENSITIZING FUROCOUMARINS  
AND MICE EXPERIMENTAL TUMORS.  
L. MUSAJO, F. BACCICHETTI and F. BORDIN  
University of Padua

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- NOTES -

PHOTOCHEMISTRY

J. E. Gill, Chairman  
Lawrence Livermore Laboratory

WAM-D1 - 9:45 am

BILIRUBIN PHOTOOXYGENATION.

D. A. LIGHTNER, G. B. QUISTAD\*, D. C. CRANDALL\* and R. D. NORRIS\*  
Texas Tech University

WAM-D2 - 10:00 am

COMPARISON OF THE SELF-SENSITIZED PHOTOOXIDATION OF BILIRUBIN AND ITS REACTION  
WITH SINGLET OXYGEN PRODUCED BY Nd-YAG LASER IRRADIATION.

I. B. C. MATHESON\*, JOHN LEE, NICK U. CURRY\* and JOHN E. WAMPLER  
University of Georgia

WAM-D3 - 10:15 am

THE ANAEROBIC PHOTOCHEMISTRY OF TRICYCLIC PSYCHOTHERAPEUTIC DRUGS.

F. W. GRANT  
Marcy State Hospital

WAM-D4 - 10:30 am

PHOTOCHEMICAL ADDITION OF GLUTATHIONE TO PYRIMIDINE BASES.

A. J. VARGHESE and H. E. JOHNS  
Ontario Cancer Institute

WAM-D5 - 10:45 am

AEROBIC PHOTOLYSIS OF ALKYLCOBALAMINS: QUANTUM YIELDS AND LIGHT-ACTION SPECTRA.

J. E. GILL and R. T. TAYLOR\*  
Lawrence Livermore Laboratory

WAM-D6 - 11:00 am

PHOTOSCISSION OF THE PHOTODIMERS OF TRANS-CINNAMIC ACID.

J. RENNERT and D. GROSSMAN\*  
The City College of CUNY

WAM-D7 - 11:15 am

LASER PHOTOLYSIS OF RETINAL AND RETINAL SCHIFF BASES.

MICHAEL M. FISHER\* and KARL WEISS  
Northeastern University

WAM-D8 - 11:30 am

ON THE SYNTHESIS OF 7-CIS-RETINALDEHYDE AND PHOTOCHEMISTRY OF RELATED COMPOUNDS.

R. S. H. LIU\* and V. RAMAMURTHY  
University of Hawaii

Wednesday Morning, June 13 - WAM-D  
CONTINUED

WAM-D9 - 11:45 am  
FORMATION OF 4,4'-AZODIBENZOIC ACID BY EXPOSURE OF A SOLUTION OF p-AMINOBENZOIC ACID TO LIGHT.  
W. L. FOWLKS  
University of Minnesota

WAM-D10 - 12:00 pm  
TRIPLET-STATE ENERGIES OF BACTERIOCHLOROPHYLL AND  $\beta$ -CAROTENE.  
JOHN S. CONNOLLY, DONALD S. GORMAN and GILBERT R. SEELY  
Wright-Patterson AFB, University of California, San Francisco and C. F. Kettering Research Laboratory

WAM-D11 - 12:15 pm  
EVALUATION OF SOME PHOTOCHEMICAL MODELS FOR RHODOPSIN.  
R. A. RAUBACH and A. V. GUZZO  
University of California, Santa Cruz and University of Wyoming

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- NOTES -

Wednesday Afternoon, June 13 - 12:45 pm  
PHOTOBIOLOGY SCHOOL  
Session III: WPM-A - CARD ROOM

WPM-A

12:45 pm - 2:00 pm  
STRUCTURAL PROPERTIES OF MEMBRANES  
IN PHOTOBIOLOGICAL SYSTEMS.  
BURTON J. LITMAN  
University of Virginia

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6:00 pm  
to  
8:00 pm

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8:00 pm

SOCIETY BUSINESS MEETING

DINING ROOM

All Members Should Attend

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- NOTES -



Thursday Morning, June 14 - 8:30 am  
Lecture V: ThAM-A - DINING ROOM

ThAM-A

8:30 am - 9:30 am  
EXTRA-OCULAR LIGHT PERCEPTION.  
MICHAEL MENAKER  
University of Texas, Austin

*Sweeney*

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- NOTES -

PHOTOBIOLOGY OF DISEASE

Frederick Urbach, Chairman  
Temple University  
School of Medicine

ThAM-B1 - 9:45 am  
HEREDITARY LIGHT-RELATED DISEASES.  
JOHN H. EPSTEIN  
University of California Medical School, San Francisco

ThAM-B2 - 10:25 am  
PHOTOTOXICITY.  
P. DONALD FORBES  
Temple University School of Medicine

ThAM-B3 - 11:05 am  
PHOTOALLERGY.  
LEONARD C. HARBER  
N. Y. U. Medical Center

ThAM-B4 - 11:45 am  
PHOTOCARCINOGENESIS.  
FREDERICK URBACH  
Temple University School of Medicine

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- NOTES -

BIOLUMINESCENCE/CHRONOBIOLOGY

M. J. Cormier, Chairman  
University of Georgia

ThAM-C1 - 9:45 am

LUMISOMES: THE CELLULAR SITE OF BIOLUMINESCENCE AND ITS CONTROL IN COELENTERATES.  
J. M. ANDERSON and M. J. CORMIER  
University of Georgia

ThAM-C2 - 10:00 am

ACTION SPECTRUM FOR A LOW INTENSITY, RAPID PHOTOINHIBITION OF MECHANICALLY STIMULABLE BIOLUMINESCENCE IN THE MARINE DINOFLAGELLATES GONYAULAX CATENELLA, G. ACATENELLA AND G. TAMARENSIS.  
WAYNE E. ESAIAS\*, HERBERT C. CURL, JR.\* and HOWARD H. SELIGER  
Oregon State University and The Johns Hopkins University

ThAM-C3 - 10:15 am

THE PHOTOINHIBITION OF MECHANICALLY STIMULABLE BIOLUMINESCENCE FROM THE MARINE DINOFLAGELLATE PYROCYSTIS LUNULA DURING SCOTOPHASE.  
J. P. HAMMAN\*, W. H. BIGGLEY\* and H. H. SELIGER  
The Johns Hopkins University

ThAM-C4 - 10:30 am

PURIFICATION AND CHARACTERIZATION OF THE LIGHT-SENSITIVE, BIOLUMINESCENT PHOTO-PROTEIN FROM MNEMIOPSIS LEIDYI.  
S. J. GIRSCH\* and J. W. HASTINGS  
Harvard University

ThAM-C5 - 10:45 am

BACTERIAL BIOLUMINESCENCE. VIBRONIC BAND ANALYSIS OF EMISSION SPECTRA FROM IN VIVO AND IN VITRO BIOLUMINESCENCE AND COMPARISON WITH THE TOTAL LUMINESCENCE OF FLAVIN CATIONS.  
GEORGE J. FAINI\*, CHARLES L. MURPHY\* and JOHN LEE  
University of Georgia

ThAM-C6 - 11:00 am

TOWARD A PROCEDURE FOR SELECTING FOR MUTANTS OF THE BIOLOGICAL CLOCK IN CHLAMYDOMONAS REINHARDI.  
S. C. STRALEY and V. G. BRUCE  
Princeton University (Introduced by J. F. Feldman, State University of New York in Albany)

ThAM-C7 - 11:15 am

PINEAL AND OPTIC FUNCTION IN THE PHOTOPERIODIC ACTIVITY RESPONSE OF JUVENILE SOCKEYE SALMON.  
J. E. BYRNE  
University of California, San Diego



ThAM-C8 - 11:30 am

EXTRA-RETINAL PHOTORECEPTION: ROLE IN RAPID DECREASE OF CHICKEN PINEAL N-ACETYL-  
ACTIVITY IN RESPONSE TO LIGHT.

S. A. BINKLEY, S. E. MacBRIDE\*, D. C. KLEIN\*, C. L. RALPH\*  
Temple University, University of Pittsburgh, NICHD

ThAM-C9 - 11:45 am

EFFECT OF LIGHT ON CELL DIVISION IN EXPONENTIALLY INCREASING CULTURES OF TETRAHYMENA  
GROWN AT LOW TEMPERATURES.

L. N. EDMUNDS, JR.  
State University of New York

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- NOTES -

PHOTOSYNTHESIS II

David Mauzerall, Chairman  
Rockefeller University

ThAM-D1 - 9:45 am  
PHOTOSYNTHESIS AND PHOTOCHEMISTRY OF PORPHYRINS.  
DAVID MAUZERALL  
Rockefeller University

ThAM-D2 - 10:15 am  
ORIENTATION OF CHLOROPHYLLS, CAROTENOIDS AND STRUCTURAL PROTEINS IN THE PHOTOSYNTHETIC MEMBRANE OF SPINACH CHLOROPLASTS: POLARIZED LIGHT SPECTROSCOPY STUDIES.  
J. BRETON, M. MICHEL-VILLAZ\* and G. PAILLOTIN\*  
Centre d'Etudes Nucleaires de Saclay

ThAM-D3 - 10:30 am  
THE CONVERSION OF PHOTOINACTIVE PROTOCHLOROPHYLLIDE<sub>633</sub> TO PHOTOTRANSFORMABLE PROTOCHLOROPHYLLIDE<sub>650</sub> IN ETIOLATED BEAN LEAVES TREATED WITH  $\delta$ -AMINOLEVULINIC ACID.  
M. L. GASSMAN  
University of Illinois at Chicago Circle

ThAM-D4 - 10:45 am  
THE MECHANISM OF REVERSIBLE DEAGGREGATION OF CHLOROPHYLL BY EXOGENOUS FATTY ACIDS.  
B. NATHANSON\* and M. BRODY  
Hunter College, CUNY

ThAM-D5 - 11:00 am  
FLUORESCENCE POLARIZATION STUDIES OF DIFFERENT SPECTROSCOPIC FORMS OF CHLOROPHYLL IN VIVO.  
J. F. BECKER\*, N. E. GEACINTOV and F. VAN NOSTRAND\*  
New York University and Oak Ridge National Laboratory

ThAM-D6 - 11:15 am  
THE PRIMARY ELECTRON DONOR UNIT IN BACTERIAL PHOTOSYNTHESIS.  
M. (CHU) KUNG\*, B. J. HALES and P. A. LOACH  
Northwestern University

ThAM-D7 - 11:30 am  
OXYGEN AND HYDROSTATIC PRESSURE EFFECTS ON ALGAL PHOTOSYNTHESIS.  
U. SCHREIBER\* and W. VIDAVER  
Simon Fraser University

ThAM-D8 - 11:45 am  
BICARBONATE EFFECT ON HILL REACTION, CHLOROPHYLL A FLUORESCENCE TRANSIENTS AND DELAYED LIGHT EMISSION IN MAIZE CHLOROPLASTS.  
ALAN STEMLER\* and GOVINDJEE  
University of Illinois

Thursday Morning, June 14 - ThAM-D  
CONTINUED

ThAM-D9 - 12:00 pm  
PHOTBLEACHING OF ADSORBED CHLOROPHYLLS IN VITRO.  
J. AGHION and M. DINANT\*  
Universite de Liege

ThAM-D10 - 12:15 pm  
CHLOROPHYLL PHOTSENSITIZED ONE-ELECTRON OXIDATION OF WATER BY BENZOQUINONE.  
J. R. HARBOUR and G. TOLLIN  
University of Arizona

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- NOTES -

Thursday Afternoon, June 14 - 12:45 pm

PHOTOBIOLOGY SCHOOL

Session IV: ThPM-A - CARD ROOM

ThPm-A

12:45 pm - 2:00 pm

SPECTROPHOTOMETRIC MEASUREMENT AND

INSTRUMENTATION IN PHOTOBIOLOGY.

JULIAN M. MENTER

University of Alabama at Birmingham

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12:45 pm

COUNCIL MEETING  
(New Council)

TV ROOM

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- NOTES -

Thursday Afternoon, June 14 - 4:00 pm  
Lecture VI: ThPM-B - DINING ROOM

ThPM-B

4:00 pm - 5:00 pm  
PHOTOMOTION IN MICROORGANISMS.  
MARY ELLA FEINLEIB  
Tufts University

*Sweeney*

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- NOTES -

Thursday Afternoon, June 14 - 5:15 pm  
Symposium VIII: ThPM-C - DINING ROOM

PHOTOBIOLOGICAL DIAGNOSIS AND PHOTOTHERAPY

Thomas R. C. Sisson, Chairman  
Temple University  
School of Medicine

~~ThPM-C1 - 5:15 pm  
LIGHT SOURCES AND MEASUREMENT.  
JOSEPH SAUSVILLE and RICHARD CORTH  
Westinghouse Electric Corporation~~

*Fuke Wainston - Director  
Fredell Eachus - medical*

ThPM-C2 - 5:55 pm  
DIAGNOSTIC USES OF PHOTOBIOLOGY.  
SEYMOUR S. WEST  
University of Alabama Medical Center

ThPM-C3 - 6:35 pm  
PHOTOCHEMISTRY OF BILIRUBIN.  
ANTONY F. McDONAGH  
University of California School of Medicine

ThPM-C4 - 7:15 pm  
MANAGEMENT OF NEO-NATAL HYPERBILIRUBINEMIA BY PHOTOTHERAPY.  
GERARD B. ODELL  
Johns Hopkins University School of Medicine

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- NOTES -

PHOTOSYNTHESIS III

Clanton Black, Chairman  
University of Georgia

ThPM-D1 - 5:15 pm  
PHOTOSYNTHETIC CARBON METABOLISM IN HIGHER PLANTS.  
CLANTON BLACK  
University of Georgia

ThPM-D2 - 5:45 pm  
DEPENDENCY ON ENVIRONMENTAL REDOX POTENTIAL OF BACTERIAL PHOTOPHOSPHORYLATION IN  
RHODOPSEUDOMONAS SPHEROIDES.  
J. A. CULBERT, D. SPONHOLTZ and P. A. LOACH  
Northwestern University

ThPM-D3 - 6:00 pm  
ASYMMETRY OF THE CHROMATOPHORE MEMBRANE FROM RPS. SPHEROIDES STRAIN R-26 BY  
REACTION WITH THE CHEMICAL PROBE <sup>35</sup>S-DIAZOBENZENE SULFONATE.  
D. W. REED, R. E. TOIA and G. A. PETERS  
Charles F. Kettering Research Laboratories (Introduced by B. C. Mayne)

ThPM-D4 - 6:15 pm  
EVIDENCE FOR A CARRIER PROTEIN IN BACTERIOCHLOROPHYLL SYNTHESIS IN R. SPHEROIDES.  
M. A. SHAW\*, M. R. PUDEK\*, R. B. WALLACE\*, M. S. TSAO\*, and W. R. RICHARDS  
Simon Fraser University

ThPM-D5 - 6:30 pm  
PHYSICAL PROPERTIES OF THE PHOTO-INDUCED RADICAL PAIR IN R. RUBRUM PHOTORECEPTOR  
SUBUNIT PREPARATIONS (PRS).  
BRIAN J. HALES and PAUL A. LOACH  
Northwestern University

ThPM-D6 - 6:45 pm  
IMMUNOCHEMICAL STUDIES OF BACTERIOCHLOROPHYLL PROTEIN COMPLEXES OF RHODOSPIRILLUM  
RUBRUM.  
W. J. LITCHFIELD\* and K. DUS  
University of Illinois

ThPM-D7 - 7:00 pm  
COMPUTER-ASSISTED ANALYSIS OF DEVELOPING PIGMENT-PROTEIN COMPLEXES IN A PHOTO-  
SYNTHETIC BACTERIUM.  
R. A. NELSON and A. W. FRENKEL\*  
University of Minnesota

ThPM-D8 - 7:15 pm  
MECHANISMS OF EXCITATION ENERGY TRANSFER IN PHOTOSYNTHESIS.  
JOHN WHITMARSH\* and R. P. LEVINE  
Harvard University

Thursday Afternoon, June 14 - ThPM-D  
CONTINUED

ThPM-D9 - 7:30 pm

FLASH PHOTOLYSIS-ELECTRON SPIN RESONANCE: A KINETIC STUDY OF ENDOGENOUS LIGHT-INDUCED FREE RADICALS IN REACTION CENTER PREPARATIONS FROM RHODOPSEUDOMONAS SPHEROIDES.

KONSTANTINE COST and JAMES R. BOLTON

Wayne State University and University of Western Ontario

ThPM-D10 - 7:45 pm

ARE CHARGE CARRIERS GENERATED IN PRIMARY PHOTOSYNTHESIS?

R. A. BOGOMOLNI and M. P. KLEIN\*

Lawrence Berkeley Laboratory

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- NOTES -



PHOTOMORPHOGENESIS/PHOTOMOVEMENT

B. G. Kang, Chairman  
Fairchild Tropical Garden  
Miami

ThPM-E1 - 5:15 pm

PHYTOCHROME-ENHANCED PHOTOTROPIC RESPONSE IN THE PEA STEM.  
B. G. KANG and S. P. BURG\*  
Fairchild Tropical Garden, Miami and University of Miami

ThPM-E2 - 5:30 pm

NECESSITY FOR BORON IN THE PHYTOCHROME-MEDIATED BIOELECTRIC POTENTIAL CHANGES.  
T. TANADA  
U. S. D. A., Beltsville

ThPM-E3 - 5:45 pm

THE PHOTOREVERSIBLE NATURE OF A PIGMENT SYSTEM IN THE GREEN ALGA, PROTOSIPHON  
BOTRYOIDES KLEBS.  
J. P. THOMAS and J. C. O'KELLEY  
The University of Alabama

ThPM-E4 - 6:00 pm

THE ROLE OF CALCIUM IN LIGHT INDUCED ION MOVEMENTS OF A MYXOMYCETE.  
J. W. DANIEL  
University of Miami

ThPM-E5 - 6:15 pm

MODEL STUDIES ON BIOLOGICAL PHOTOREGULATION.  
W. PRINS  
Syracuse University

ThPM-E6 - 6:30 pm

AN ACTION SPECTRUM FOR THE PHOTOINDUCTION OF CAROTENOID SYNTHESIS IN NEUROSPORA  
CRASSA BETWEEN 250 AND 500 nm ASSAYED BY IN VIVO SPECTROPHOTOMETRY.  
EDWARD C. DE FABO, ROY W. HARDING and W. SHROPSHIRE, JR.  
Smithsonian Institute

ThPM-E7 - 6:45 pm

THE PHOTORECEPTOR PIGMENT OF PHOTOTAXIS IN DICTYOSTELIUM DISCOIDEUM.  
K. L. POFF\* and W. L. BUTLER  
University of California, San Diego

ThPM-E8 - 7:00 pm

NEUROHUMOR EFFECTS ON DINOFLAGELLATE PHOTOTAXIS.  
R. B. FORWARD, JR.  
Duke University Marine Laboratory

ThPM-E9 - 7:15 pm

THE PHOTORECEPTOR MOLECULE OF PHYCOMYCES.  
J. J. WOLKEN  
Carnegie-Mellon University