



NEWSLETTER

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Meeting Announcement

The National Toxicology Program of the U.S. Department of Health and Human Services will sponsor a conference on the "Photobiologic, Toxicologic, Pharmacologic, and Therapeutic Aspects of Psoralens." This conference will be held on March 1, 2 & 3, 1982, at the National Institutes of Environmental Health Sciences, Research Triangle Park, NC, USA. The meeting will cover the basic and clinical aspects of psoralen photochemotherapy with special emphasis on psoralen photochemistry, interactions of psoralens with DNA, RNA and proteins, acute and chronic toxicity, mutagenicity, carcinogenicity, structure and photosensitivity activity relationship, and clinical responses of various psoralens in relationship to photochemotherapy of psoriasis, vitiligo, etc. For further information, please contact Dr. Madhu A. Pathak at the Department of Dermatology, Harvard Medical School, Massachusetts General Hospital, Boston, MA, 02114, USA (617-726-3996) or Dr. June K. Dunnick at the National Toxicology Program, NIEHS, Research Triangle Park, NC, 27709, USA (919-541-4811). The meeting is open to all interested in psoralens and their usefulness in basic science and medicine.

Tentative Agenda

Session I - Photobiological Properties of Psoralens - Monday, March 1, 8:30 a.m. - Noon.

Chairmen: L.I. Grossweiner (Chicago, USA) & G. Rodighiero (Paduva, Italy)

NTP Welcome (D. Rall & J.A. Moore, Research Triangle Park, USA)

Historical Aspects of Psoralens (T.B. Fitzpatrick & M.A. Pathak, Boston, USA)

Photoreactive States of Furocoumarins (P. Soon-Song, Lubbock, USA) (Poster Session)

In Vitro Photoreactions of Psoralens with DNA (J.E. Hearst, Berkely, USA)

In Vitro Photoreactions of 8-MOP, 5-MOP, 3-Carbethoxypsoralen & Methylpsoralens with DNA, RNA & Proteins (G. Rodighiero, Paduva, Italy)

In Vitro Photoreactions of Psoralens with DNA, RNA and Proteins & Their Action Mechanism of Skin Photosensitization (M.A. Pathak, Boston, USA)

Mechanisms of Psoralen Photosensitization Reactions (L.I. Grossweiner, Chicago, USA)

Chemical Mediators in Psoralen Photosensitization In Vivo (J.A. Parrish, Boston, USA)

Summary & Rapporteurs: L.I. Grossweiner (Chicago, USA) & G. Rodighiero (Paduva, Italy)

Session II - Pharmacokinetics & Pharmacodynamics of Psoralen Metabolism - Monday, 2:00 - 3:30 p.m.

Chairmen: G.S. Lazarus (Durham, USA) & H.B. Mathews (Research Triangle Park, USA)

Absorption & Metabolism Studies of Various Psoralens in HRA/SKH Mouse (K. Loveday & I. Muni, Bioassay Systems, Woburn, USA)

Comparison of Pharmacokinetics & Pharmacodynamics of 8-MOP, 5-MOP & TMP (R. Brickl, Biberach, West Germany)

Absorption & Metabolism of 8-MOP in Mice & Rats (H. Wulff, Copenhagen, Denmark)

Metabolism of Psoralens (8-MOP & TMP) in Humans (M.A. Pathak, Boston, USA)

Summary & Rapporteurs: G.S. Lazarus (Durham, USA) & H.B. Mathews (Research Triangle Park)

Session III - Mutagenicity of Psoralens - Monday, 3:45 - 5:15 p.m.

Chairmen: K. Smith (Stanford, USA) & D.M. Carter (New York, USA)

Mutagenicity of Linear & Angular Psoralens in Bacteria & Fungi (B.R. Scott, Smithville, USA)

Mutagenic Effects of Psoralens in Yeast (D. Averbek, Paris, France)

Genetic Repair Responses to Psoralen Adducts in DNA in Eukaryotic Cells (P. Hanawalt, Stanford, USA)

Psoralen & Sister Chromatid Exchanges in Eukaryotic Cells (K. Loveday, Woburn, USA)

Summary & Rapporteurs: K. Smith (Stanford, USA) & B.R. Scott (Smithville, USA)

Session IV - Carcinogenic & Immunologic Aspects of PUVA - Tuesday, March 2, 8:30 - 12:15 p.m.

Chairmen: J.H. Epstein (San Francisco, USA) & K. Halparin (Miami, USA)

Chronic Toxicity of Psoralens in Animals (D. Forbes, Philadelphia, USA)

Cytological Effects of PUVA: Acute & Chronic Effects in Psoriasis & Vitiligo (T.J. Harrist, Boston, USA)

Carcinogenicity of Monofunctional & Bifunctional Psoralens (M.A. Pathak, Boston, USA)

Issue of Carcinogenicity of PUVA Photochemotherapy in Humans (US Cooperative 16-Center PUVA Study) (R.S. Stern, Boston, USA)

Issue of Carcinogenicity of PUVA (European Cooperative PUVA Study) (E. Christophers, Berlin, West Germany)

Separation of UV Effects & Psoralen Effects (F. Urbach, Philadelphia, USA)

Summary & Rapporteurs: J.H. Epstein (San Francisco, USA) & K. Halparin (Miami, USA)

UV Radiation & Cancer Immunology with Special Emphasis on Psoralens (M.L. Kripke, Frederick) Effects of Psoralens on Immune System:

1. In Vitro Effects (K. Kramer, Bethesda, USA)

2. In Vivo Effects (W.L. Morison, Baltimore, USA)

Summary & Rapporteurs: W.L. Morison (Baltimore, USA) & J.A. Parrish (Boston, USA)

Session V - Other Side Effects of Psoralen Photochemotherapy - Tuesday, 2:00 - 5:15 p.m.

Chairmen: J.A. Parrish (Boston, USA) & T.P. Nigra (Washington, DC, USA)

Psoralens & Ocular Effects in Animals (S. Lehrman, Atlanta, USA)

Psoralens & Ocular Effects in Humans (W. Glew & T.P. Nigra, Washington, DC, USA)

In Vitro and In Vivo Effects of Psoralens on Melanocytes (D.M. Carter, New York, USA)

Melanin Pigmentation: Normal & Abnormal Responses to PUVA Therapy (T.B. Fitzpatrick & A.R. Rhodes, Boston, USA) (Poster Session)

Alteration of Enzyme Levels in PUVA Therapy (T.B. Fitzpatrick & A.R. Rhodes, Boston, USA)

Subchronic Toxicity of 8-MOP in Rats (J.K. Dunnick, Research Triangle Park, USA)

Summary & Rapporteurs: J.A. Parrish (Boston, USA) & T.P. Nigra (Washington, DC, USA)

Session VI - Safety & Therapeutic Effectiveness of PUVA - Wednesday, March 3, 8:30 - 10:30 a.m.

Chairmen: T.B. Fitzpatrick (Boston, USA) & F. Urbach (Philadelphia, USA)

Safety & Therapeutic Effectiveness of 8-MOP, 5-MOP & Other Psoralens in Psoriasis (K. Wolff, Vienna, Austria)

Safety & Therapeutic Effectiveness of 8-MOP, 5-MOP, TMP & Psoralen in Vitiligo (M.A. Pathak, D.B. Mosher & T.B. Fitzpatrick, Boston, USA)

Effectiveness of Psoralens in Mycosis Fungoides (H.H. Roenigk, Chicago, USA)

Combination Therapy in Psoriasis and Other Diseases (J.A. Parrish, Boston, USA)

Summary & Rapporteurs: T.B. Fitzpatrick (Boston, USA) & F. Urbach (Philadelphia, USA)

Session VII - Analytical Aspects of Psoralen Activity - Wednesday, 10:45 - 12:30 p.m.

Chairmen: A. Kornhauser (Washington, DC, USA) & M. Wick (Boston, USA)

Penetration of Topically Applied Psoralens into Skin (H. Schaefer, Paris, France)

Methods for Assaying 8-MOP in Plasma (D.M. Carter & associates, New York, USA)

Separation of Psoralen Metabolites in Urine & Plasma by HPLC (K. Loveday & I. Muni, Bioassay Systems, Woburn, USA)

Methods for Assessing Skin Photosensitizing Activity of Furocoumarins (I. Willis, Atlanta)

Difference in Topical & Systemic Reactivity of Psoralens (A. Kornhauser, Washington, DC, USA & M.A. Pathak, Boston, USA)

Summary & Rapporteurs: M. Wick (Boston, USA) & A. Kornhauser (Washington, DC, USA)

Session VIII - Scientific Committee & Rapporteurs' Meeting - Wednesday, 2:00 to 3:30 p.m.

Chairmen: T.B. Fitzpatrick & M.A. Pathak (Boston, USA)

1. Overall Summary of Psoralen Conference (M.A. Pathak, Boston, USA)

2. Cancer & Psoriasis in Relation to PUVA (K. Halparin, Miami, USA)

3. Recommendations on Psoralen Use & Needs for Future Studies (Scientific Committee Report)

History - The Evolution of Photobiology

Photobiology was before Creation - J. W. Longworth

John Draper spoke for one hour before Samuel Wilberforce at the second symposium session devoted to the theory of evolution on Friday, June 29th, in 1860 at Oxford. It is perhaps a liberty to describe Draper as a photobiologist, though he was a photochemist and physiologist.

The occasion for the session was the annual meeting of the British Association for the Advancement of Science. The group was often known as the British Ass to friends or described as a "colt show" for "twaddlers" to its critics. Charles Darwin was amongst the BA's critics and did not choose to speak, but left it to others.

The previous day had created heated discussion from Thomas Huxley in the audience towards the critical comments on evolution from leading zoologists. This Friday afternoon an overflow crowd gathered at the Museum filling up the larger hall that the session had been moved to at the last minute. All were anxious to hear the remarks of the Bishop of Oxford and the response of Darwin's able supporter, Thomas Huxley. The first speaker was John Draper who was then President of New York University. He spoke at length to an audience expectant for Wilberforce with the subject "The intellectual development of Europe considered with reference to the views of Mr. Darwin and

others." I am sure all biologists imagine themselves to have been present, and the recent reconstruction by the BBC becomes only *deja vu*.

When Draper at long last finished, the chairman requested that only valid scientific arguments be asked of the speakers and so he ignored many seeking a presentation. One man rushed forward in the noise and wrote two X's upon the blackboard announcing that point A was man and point B monkey. Undergraduates at the back of the room began to chant "Monkey, Monkey." Seeing the Bishop of Oxford enter the room, the crowd called for Wilberforce to speak.

Samuel Wilberforce was the son of the renowned politician William, who is remembered for his staunch antislavery philanthropy. Samuel was elevated to the Bishop of Oxford on the conversion to Rome of his predecessor John Newman in 1845. Later in his career Wilberforce began the effort to modernize the bible resulting in the Revised Standard Version. He was a conservative high churchman and the audience expected him to smash Darwin. He was cheered as he began to speak and for half an hour savagely ridiculed Darwin and his theory of evolution. To end, he turned on Huxley with the sarcastic query on whether it was through his grandfather or his grandmother that Huxley claimed descent from an ape. Huxley immediately commented under his breath to the chairman upon the divine opportunity Wilberforce had provided him with; "the Lord hath delivered him to mine hands". To a stilled audience Huxley powerfully reduced the arguments of the Bishop of Oxford because of their ignorance. Huxley ended with the climatic retort that he would feel no shame should apes be ancestors but would be ashamed of a brilliant man who plunged into matters he knew not of. To quote a member of the audience on the excoriation, "I asserted and I repeat that a man has no reason to be ashamed of having an ape for his grandfather. If there were an ancestor whom I should feel shame in recalling, it would rather be a man, a man of restless and versatile intellect, who not content with an equivocal success in his own sphere of activity plunges into scientific questions with which he has no real acquaintance, only to obscure them by aimless rhetoric, and distracts the attention of his hearers from the real point of issue by eloquent digressions and skilled appeals to religious prejudice."

The room then plunged into uproar, many outraged by what they considered was an attack upon a member of the clergy. Admiral Fitzroy, who had captained the *Beagle*, waved his bible and shouted that rather than the viper he had harbored in his ship, it was the true and unimpeachable authority. But all who left knew Huxley had carried the day, yet the same debate with the same discussion and outcome continues to this day.

But more of the first speaker, John Draper. Draper was born in 1811 in St. Helens in Lancashire in the North of England. He gained a degree from the University of London and then received an M.D. at the University of Pennsylvania in 1836. Draper taught chemistry for two years at the Episcopal College of Hampden-Sydney in southern Virginia. He then joined the University of the City of New York (now NYU) in the Chemistry Department and founded its Medical School in 1839. This was an important year for Draper since the French Government released the proprietary rights to the Daguerre photographic methods. Draper, having studied photochemical effects, was well placed to reproduce the methods and is amongst the pioneers of the Daguerre method in America. He took a photograph of his sister, which is the oldest American daguerrotype of which there remains a copy. Draper realized that the ultraviolet was the most effective radiation and placed the photosensitive surface at this focus and thus achieved sharp images which defied other pioneers. In 1840 Draper took the first photograph of the moon (it is in memory of his son that the Harvard star photograph collection is named), and by 1843 had recorded photographically the solar spectrum. Draper's photochemical studies caused him in 1841 to reemphasize the importance that light must be absorbed before any chemical change can be caused by light. This is the prime law of photobiology, and had first been stated by Theodore Grotthus (1785-1822). Grotthus was a German and had studied chemistry in Leipzig, graduating in 1803. He studied then at the Ecole Polytechnique, recently established by the National Convention in Paris (1794). His interest in photochemistry was undoubtedly stimulated by the work of Jean Dessaignes, director at the College of Vendome in the Loire. Dessaignes performed pioneer studies on the luminescence of semiconductors. Grotthus returned to manage the family estates at Geddutz near Vilnyus which was then in a duchy of Russia, now Lithuania SSSR. He began independent research in 1808 on thermoluminescence and published two reports in 1815 on the necessity of light absorption to create phosphorescence. This is the Grotthus (1815)-Draper (1841) law.

Edmond Becquerel in Paris, also in 1839, discovered that radiation emitted from an electrical spark in air was able to excite phosphorescence after transmission through quartz, but was not transmitted through glass. John Draper repeated the study and showed that the phosphorogenic radiation emitted by an electric spark discharge (this must have been 296 nm) was not transmitted through glass, but the radiation from the incandescence of a block of calcium carbonate heated with an oxy-hydrogen flame (limelight) was transmitted through glass (318 nm thermally excited calcium (II)). Draper called these nonvisible radiations, tithonic radiation (Aurora fell in love with the beautiful youth Tithonus). In our mundane fashion we describe them as ultraviolet radiation.

In later years Draper wrote a history of the Civil War, and his final work will come as no surprise - *The History of Conflict between Religion and Science* (1873). Draper made contributions to chemistry, medicine, history, and philosophy - rare accomplishments.

Award - Nien-Chu C. Yang receives The Gregory and Freda Halpern Award in Photochemistry

Dr. Nien-Chu C. Yang, Professor of Chemistry at the University of Chicago, was the recipient of The Gregory and Freda Halpern Award in Photochemistry sponsored by the Polychrome Corporation at The New York Academy of Sciences 164th Annual Meeting held on December 3rd at the Tower Suite atop the Time & Life Building. Dr. Heinz Pagels, President of the Academy, presented a certificate of citation and an award of \$1,000 to Dr. Yang in recognition of his outstanding contributions to the science of photochemistry.

Dr. Yang received his B.S. from St. John's University at Shanghai and has been at the University of Chicago since 1956. Dr. Yang has received many honors. From 1960-1964, Dr. Yang was a Fellow of the Alfred P. Sloan Foundation. In 1965, Dr. Yang was the recipient of the Quantrell Prize for Excellence in Undergraduate Teaching; in 1973, a National Cancer Institute Special Fellow at the University of Chicago; and in 1974 a Guggenheim Fellow. He is a Fellow of The New York Academy of Sciences and an Honorary Research Professor at the Academic Sinica, Beijing.

Dr. Yang is noted for his research of the mechanistic studies of organic photochemistry, particularly his discovery of novel photochemical reactions and mechanisms. He is a pioneer in the study of the mechanism of excited state reactions. His work in organic photochemistry of nucleic acids derivations has served as a model for achieving a much better understanding of the mechanism of radiation-induced mutagenesis in biological systems.

The author of over 100 publications, Dr. Yang has been recognized as a leading authority in photochemistry. In 1964, he was a plenary lecturer at the 1st IUPAC Symposium on Photochemistry at Tilton, New Hampshire. He has been a consultant to Upjohn Company from 1963-1970; the G.D. Searle Company from 1979-80; and a technical adviser to the National Cancer Institute from 1974-1977. A member of the American Chemical Society; the Chemical Society in London; the American Association for the Advancement of Science; and the American Association for Cancer Research, Dr. Yang also holds three patents.

The New York Academy of Sciences is an international membership organization composed of more than 30,000 scientists, from all 50 states, and 80 foreign countries, representing every scientific discipline. The Academy, with a long tradition of education in science, sponsors and average of 15 international conferences each year which are concerned with active research in a variety of disciplines. The conference proceedings are published as the Annals, a distinguished series distributed to the Academy's membership and libraries worldwide. The Sciences, a magazine published ten times yearly by the Academy, discusses and interprets the latest science news for the layman and for the scientist reading outside his own field.

Vancouver Meeting

Members have received a "Call for Papers" for the 10th annual meeting of ASP to be held in Vancouver, British Columbia, Canada, from June 27th to July 1st, 1982. The deadline for receipt of abstracts is March 26th, 1982. Pre-registration information including room reservation cards will be mailed in this month.

Job Opening

POSTDOCTORAL POSITION open from January 1982. Investigations into the properties of singlet molecular oxygen in model biological systems. Background in physical chemistry/biophysics with some experience in kinetic spectrophotometry preferred but not essential. Send resume and names of three referees to Dr. M.A.J. Rodgers, CFKR, Patterson 131, University of Texas, Austin, TX 78712.

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