

Harvard Medical School/Harvard School of Dental Medicine

Date Prepared: February, 2018
Name: Irene Emily Kochevar
Office Address: Wellman Center for Photomedicine
Department of Dermatology
Massachusetts General Hospital, Thier 212
Harvard Medical School
Boston, MA 02114
Work Phone: 617-726-8828
Work Email: kochevar@helix.mgh.harvard.edu
Work FAX: 617-726-3192

Education

1965	BS	Biochemistry	Michigan State University
1967	MS	Biochemistry	Michigan State University
1970	PhD	Chemistry	Michigan State University

Postdoctoral Training

1970-1971	NIH Postdoctoral Fellow	Department of Chemistry	New York University
1975-1977	NIH Postdoctoral Fellow	Department of Chemistry	Columbia University

Faculty Academic Appointments

1973-1975	Research Associate	Department of Chemistry	Columbia University
1977-1979	Research Associate	Department of Biochemistry	Columbia University
1979-1981	Assistant Professor of Dermatological Biochemistry	Department of Dermatology	Columbia University
1981-1987	Principal Associate in Dermatology	Department of Dermatology	Harvard Medical School
1986-1987	Visiting Professor	Department of Chemistry	University of Connecticut
1987-1999	Associate Professor	Department of Dermatology	Harvard Medical School
1988-1999	Associate Professor	Division of Health Sciences & Technology	Massachusetts Institute of Technology
1999-2005-	Professor Associated Faculty	Department of Dermatology Harvard-MIT Health Sciences Technology Program	Harvard Medical School Massachusetts Institute of Technology

Appointments at Hospitals/Affiliated Institutions

1981-1986	Associate Biochemist	Massachusetts General Hospital
1986-	Biochemist	Massachusetts General Hospital

Other Professional Positions

1971-1973	Research Chemist	Union Carbide Corporation, Bound Brook, NJ
-----------	------------------	--

Major Administrative Leadership Positions

Local

1965-1970	Research Assistant	Departments of Biochemistry and Chemistry , Michigan State University
-----------	--------------------	---

National and International

1988-1992	Association Internationale de Photobiologie	Vice President
1980-1983	American Society for Photobiology	Council member
1985-1987	American Society for Photobiology	President-Elect, President, Past President
1998-2002	Inter-American Photochemical Society	Board of Directors

Committee Service

Local

1983-1987	Subcommittee on Research Safety	Massachusetts General Hospital
1986-1992,	Subcommittee on Review of Research	Massachusetts General Hospital
1997-2000	Proposals	
1986-1987,	Committee on Research	Massachusetts General Hospital
1990-1993		

National and International

1979-1983	Photobiology Task Force	American Academy of Dermatology
1979-1981	Committee on Photobiology	National Research Council
1980-1983	Council	American Society for Photobiology
1985	National Meeting Organizer	American Society for Photobiology
1986-1991	Advisory Board	Center for Fast Kinetics Research, University of Texas at Austin
1992-1996	Scientific Advisory Board	Center for Advanced Research in Photobiology
1991, 1995, 2004	Scientific Advisory Board	NIEHS Laboratory of Molecular Biophysics
2007-2013	Scientific Advisory Board	Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of Technology

Professional Societies

American Chemical Society	Member
American Society for Photobiology	Member
Inter-American Photochemical Society	Member
Society for Investigative Dermatology	Member
New York Academy of Sciences	Member
American Association for the Advancement of Science	Member
European Photochemical Association	Member
European Society for Photobiology	Member
Society for Free Radicals in Biology and Medicine	Member

Grant Review Activities

1994, 1995	NIH MBRC Evaluation committees	NIH
1997 - 2001	Regular member	NIH General Medicine A-1 Study Section
Reviewer for many NIH special review panels and multiple European and Canadian granting agencies; list not recorded.		

Editorial Activities

Reviewer for many journals covering topics in organic chemistry, photochemistry, photobiology, dermatology, photomedicine, oxidative stress, cell biology, laser medicine.

Other Editorial Roles

1983-1993	Associate Editor	Photochemistry and Photobiology
1994-1998	Editor-in-Chief	Photochemistry and Photobiology
1990-1999	Associate Editor	Photodermatology, Photoimmunology, Photomedicine

Honors and Prizes

1967	Dow Summer Fellow	Department of Chemistry, Michigan State University
1967-1968	Du Pont Fellow	Department of Chemistry, Michigan State University
1968	Outstanding Woman Graduate Student	Michigan State University
1969-1970	Lubrizol Fellow	Department of Chemistry, Michigan State University
1995	Fellow	American Association for the Advancement of Science
1997	Photon Award	American Society for Photobiology

Report of Local Teaching and Training

Teaching of Students in Courses

1978-1980	Biochemistry	Columbia University Organized and taught biochemistry seminar for medical students
1983, 1985, 1989, 1991	Harvard University course on Photobiology (Biology 289)	Lecturer, Harvard University
1988-1990	HST 569, Photomedicine	Massachusetts Institute of Technology, Course Director
1992	HST 569, Photomedicine	Massachusetts Institute of Technology, Course Director

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

1977-1981	Photobiology Seminar	Columbia University Organized and lectured in course for dermatology residents and fellows
1983	Photobiology Course for Dermatology residents	Lecturer, Massachusetts General Hospital
1985-1988	Wellman tutorials for residents and fellows	Massachusetts General Hospital series of six sessions each year in photochemistry and photobiology
1989-1990	Photobiology Workshops and Lecture Series	Massachusetts General Hospital, Co-Coordinator

Laboratory and Other Research Supervisory and Training Responsibilities

Formally Supervised Postdoctoral Trainees (records not kept for undergraduate trainees)

Training Period	Trainee Name	Degree(s)	Research Project Title	Current Position of Past Trainees
1979-1980	Chung, Fung Lung	PhD	Chlorpromazine photo-toxicity	Prof. Oncology, Georgetown Univ.
1978-1980	Gasparro, Frank	PhD	Protryptiline phototoxicity	Chem. teacher, Hall Hamden School, CT
1980-1982	Yoon, MinJoun	PhD	UV-induced membrane damage	Prof. Chem., Seoul Natl. Univ., Korea
1983-1984	Gendimenico, Gerard	PhD	Mast cells in drug photo-toxicity	Sr. Proj. Mgr., Johnson & Johnson
1983	Hasan, Tayyaba	PhD	Tetracycline drug photo-toxicity	Prof. of Dermatology, HMS; Wellman Photomed., MGH
1985-1987	Van Camp, John	PhD	Rose Bengal photosensitized DNA cleavage mechanisms	Senior Research Leader, Perkin Elmer, Mountainview CA
1985-1986	Western, Andre	PhD	Amiodarone drug photo-toxicity	CRA, Quintiles; Study coord., Nycomed Imaging, Norway

1987-1988	Valdes-Aguilera, Oscar	PhD	Photosensitized mitochondrial damage	Sr. Development Chemist, Cytec Surface Industries, GA
1987-1989	Hurley, John	PhD	Laser flash photolysis of drugs	Senior Research Assoc. University of Arizona
1988-1990	Dunn, David	PhD	Dye photosensitized DNA cleavage	Dir., HTS Technologies, Pharmacopeia, Inc.
1988-1989	Allen, Mary Tedd	PhD	Rose Bengal membrane photosensitization	VP Manufacturing, nanoString Technology, Seattle WA
1989-1992	Redmond, Robert W.	PhD	Multiphoton photosensitization	Assoc Prof, Wellman Center, MGH/HMS
1989-1991	Chaudry, Nina	MD	Photovasoelaxation	Asst. Prof. Cardiology, Columbia Univ. Coll. of Physicians and Surgeons, NY, NY
1988-1990	Lilge, Lothar	PhD	Applications of light + lasers in medical pre-clinical + clinical research	Assoc. Prof./Sr. Scientist, Ontario Cancer Inst./Princess Margaret Hosp., Toronto, Can.
1991-1994	Garcia, Carmello	PhD	Chlorpromazine photo-physics + photochemistry	Prof. Chem., Univ. Puerto Rico
1992-1995	Nguyen, Bach-Cuc	PhD	Mechanisms for skin pigmentation induced by dihydroxyacetone	Research Assoc., CBRC, MGH
1993-1994	Lambert, Christopher	PhD	Intensity dependent photochemistry and photobiology of rose Bengal	Assoc. Research Prof., Bioengineering Inst., Worcester Polytechnic Inst., MA
1993-1995	Martinez, Lydia	PhD	Two-photon DNA photochemistry	Visiting Prof. Chem., Union Coll., NY
1994-1996	Gonzalez, Salvador	MD	Involvement of mast cells in chronic UVB damage to skin	Assoc. Prof. of Med., Univ. Alcala, Madrid, Spain
1994-1995	Tedesco, Antonio C.	PhD	Photosensitized plasma membrane damage	Prof. Chem., Univ. of Sao Paulo, Brazil
1995-1997	Philips, Neena	PhD	Effects of chronic UVB on dermal fibroblasts	Assoc. Prof. of Biol. Scis., Fairleigh Dickinson Univ., NJ
1996	Ibbotson, Sally	MD	Free radicals and skin aging	Sr. Lecturer, Ninewells Hosp. & Med. School, Dundee, Scotland
1998-2003	Zhuang, Shougang	MD PhD	Singlet oxygen-induced signal transduction pathways	Assoc. Prof., Brown Univ. Med School
2000-2002	Chan, Barbara P.	PhD	Photochemical tissue bonding for skin grafts and	Assoc. Prof. Bioengineering, Univ. of

			tendon repair	Hong Kong
2000-2002	Proano, Cinthia	MD	Photochemical tissue bonding of cornea in vivo	Faculty, Essex Community Coll.
2001-2002	Mitsomoto, Atushi	PhD	Role of reactive oxygen species in stimulation of elastin produced by dermal fibroblasts	Assoc. Prof., Josai Intl. Univ., Tokyo, Japan
2001-2003	Kossodo, Sylvie	PhD	Effects of UV-induced cytokines on extracellular matrix proteins + proteases	Research Group Leader, VisEn Med. Co., Bedford, MA
2001-2005	Choi, Won-Seon	PhD	Role of TGF- β in skin photoaging	Patent Lawyer, Washington DC
2002-2003	Wong, Wen-Rou	MD	Involvement of UV-induced cytokines in photoaging	Clin. practice, Chang-Gung Med. Coll., Taiwan
2002-2004	Carle, A. Bjoern	PhD	Selective UVA-induced processes at the plasma membrane using evanescent wave radiation	Sr. Applications Scientist, Artel, Inc.
2002-2005	Kamegaya, Yoko	MD	Evaluation of photochemical tissue bonding for closure of skin incisions + excisions	Dept. of Dermatol., Keio Univ. Hosp., Japan
2003-2005	Wang, Hongjun	PhD	UVB-induced production of TGF- β by human keratinocytes	Assoc. Prof. Biomed. Engineering, Stevens Inst. of Technology, Hoboken, NJ
2003-2006	Valencia, Antonio	PhD	Mechanisms of apoptotic cell death by free radicals	Group Leader, Biogen/Iddec, Cambridge MA
2005-2006	Dowdall, Jayme Rose	MD	Photochemical repair of vocal fold microflap defects	Asst. Prof, Otolaryngology, MEEI
2006-2008	Yamaura, Maki	MD	Role of superoxide generating NADPH oxidase 4 in melanotic cell proliferation	Dept. Dermatol., Shinshu Univ. Hosp., School of Med.. Japan
2006-2010	Yao, Min	MD, PhD	Technology for sutureless closure of surgical incisions + wounds	Prof. Burn & Plastic Surgery, Shanghai Jio Tong University Medical School, China
2007	Chung, Connie	MD, PhD	Biophysics + protein structure	Clin. Instr. Dermatol., HMS; Dermatologist, MGH
2008-2009	Wang, Ying	MD	Light-activated treatment for ocular surface damage	Instructor, Wellman Center, MGH
2008-2009	Venditti, Elisabetta	PhD	UVA and nitroxides as	Research Assistant at

			inhibitors of oxidative damage to skin collagen	Istituto Europeo di Oncologia (IEO)
2008-2011	Datta, Neha	MD	Photochemical technologies for surgical applications	Resident, Dept Surgery, UCLA
2009-2010	Tang, Yijin	PhD	Collagen photocrosslinking mechanisms	Research Fellow, New York State Department of Health
2010-2011	Gu, Chuan	MD	Photorepair of limbal stem cell deficiency	Dept. of Plastic & Burn Surg., No. 3 People's Hosp., Shanghai Jiao Tong University, Shanghai China
2010-2011	Bajwa, Amrita Kaur	MA	Photobonding to repair penetrating eye wounds	Grad. Student, Dept. Plant + Microbial Biol., Univ. CA, Berkeley
2010-2011	Yang, Penggao	MD	Effects of photochemical tissue bonding on one-layer skin incision closure;	Dept. of Plastic & Burn Surg., No. 3 People's Hosp., Shanghai Jiao Tong University, Shanghai China
2012	Tjiu, Jengwei	MD, PhD	Photosensitization of keratinocytes	Asst. Prof., Derm. National Taiwan Univ.
2012-2015	Zhu, Hong	MD	Keratoconus treatment	Ophthalmology, People's Hospital #1, Shanghai, China
2012-2015	Xu, Nan	MD	Pigmented skin wound sealing	Shanghai East Hospital, Tongji University School of Medicine, Shanghai, China
2016-present	Seiler, Theo G	MD	Interfacial cornea photobonding	
2017-2018	Wertheimer, C.	MD	Crosslinking mechanisms	

Formal Teaching of Peers (e.g., CME and other continuing education courses)

1979-1982	Photobiology course , taught basic photobiology	American Academy of Dermatology Meeting, Lecturer
1980	Photobiology course	Columbia University Organized and lectured in six-hour course
1982-1984	Photobiology Workshops and Lecture Series, Coordinator	Massachusetts General Hospital

Local Invited Presentations

Record not maintained of presentations.

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Record not maintained of presentations.

Report of Technological and Other Scientific Innovations

Photochemical tissue bonding	US 8092490	January 10, 2012
Photochemical tissue bonding	US 8215314	July 10, 2012
Photochemical tissue bonding	US 7331350	February 19, 2008
Photochemical tissue bonding	US 7073510	July 11, 2006
Photochemical tissue bonding	AU 2001249984	
Photochemical tissue bonding	JP 5101778	
Photochemical tissue bonding	EP 1272119	
Photochemically induced engagement of intraocular implants	EP 3067015	

Report of Scholarship

Publications

Peer reviewed publications in print or other media

1. Speck JC Jr, Rynbrandt DJ, Kochevar IE. Neighboring group participation in acetal hydrolysis. J Am Chem Soc. 1965; 87:4979-4980.
2. Wagner PJ, Kochevar IE. How efficient is diffusion controlled triplet energy transfer? J Am Chem Soc. 1968; 90:2232-2238.
3. Kochevar IE. A kinetic study of the quenching of triplet butyrophenone by mono-olefins. Ph.D. Dissertation. Michigan State University, 1970.
4. Kochevar IE, Wagner PJ. Triplet ketone-olefin interactions: Energy transfer, charge transfer or radical addition? J Am Chem Soc. 1970; 92:5742-5743.

5. Kochevar IE, Wagner PJ. Quenching of triplet phenyl ketones by olefins. *J Am Chem Soc.* 1972; 94:3859-3865.
6. Wagner PJ, Kochevar IE, Kempainin AE. Type II photoprocesses of phenyl ketones. Procedure for determining meaningful quantum yields and triplet lifetimes. *J Am Chem Soc.* 1972; 94:7489-7495.
7. Wamser CC, Medary RT, Kochevar IE, Turro NJ, Chang PL. Steric effects on singlet and triplet energy transfer to azo compounds. *J Am Chem Soc.* 1975; 97:4864-4869.
8. Kochevar IE, Harber LC. Photoreactions of 3,3',4',5-tetrachloroalicylanilide with proteins. *J Invest Dermatol.* 1977; 68:151-156.
9. Turro NJ, Kochevar IE, Noguchi Y, Chow MF. Electronic excitation transfer in polymers III. Singlet-singlet, triplet-singlet and triplet-triplet energy transfers. Evidence for triplet migration among pendant phenyl groups in polystyrene. *J Am Chem Soc.* 1978; 100:3170-3177.
10. Kochevar IE. Photoallergic responses to chemicals. *Photochem Photobiol.* 1979; 30:437-442.
11. Kochevar IE, Lamola AA. Chlorpromazine and protriptyline phototoxicity: photosensitized, oxygen independent red cell hemolysis. *Photochem Photobiol.* 1979; 29:791-796.
12. Kochevar IE, Zalar GL, Einbinder J, Harber LC. Assay of contact photosensitivity to musk ambrette in guinea pigs. *J Invest Dermatol.* 1979; 73:143-146.
13. Sutherland BM, Harber LC, Kochevar IE. Pyrimidine dimer formation and repair in human skin. *Cancer Res.* 1980; 40:3181-3185.
14. Kochevar IE. Toxicity due to photochemical products of protriptyline. *Toxicol Appl Pharmacol.* 1980; 54:258-264.
15. Giovinazzo VJ, Harber LC, Armstrong RB, Kochevar IE. Photoallergic contact dermatitis to musk ambrette: Clinical report of two patients with persistent light reactor patterns. *J Am Acad Dermatol.* 1980; 3:384-393.
16. Giovinazzo VJ, Ichikawa H, Kochevar IE, Armstrong RB, Harber LC. Photoallergic contact dermatitis to musk ambrette: Action spectra in guinea pigs and man. *Photochem Photobiol.* 1981; 33:773-777.
17. Lamola AA, Landon D, Kochevar IE, Harber LC. An instrument for action spectrum studies in dermatology. *Photochem Photobiol.* 1982; 35:285-290.
18. Gasparro FP, Kochevar IE. Investigation of protriptyline photoproducts which cause cell membrane disruption. *Photochem Photobiol.* 1982; 35:351-358.
19. Kochevar IE, Armstrong RB, Einbinder J, Walther RR, Harber LC. Coal tar phototoxicity: active compounds and action spectra. *Photochem Photobiol.* 1982; 36:65-69.

20. Kochevar IE, Hom J. Photoproducts of chlorpromazine which cause red blood cell lysis. *Photochem Photobiol.* 1983; 37:163-168.
21. Kochevar IE, Yoon M. Photosensitization of methyl linoleate oxidation by tryptophan in peptides. *Photochem Photobiol.* 1983; 37:279-286.
22. Hasan T, Kochevar IE, McAuliffe DJ, Cooperman BS, Abdulah D. Mechanism of tetracycline phototoxicity. *J Invest Dermatol.* 1984; 83:179-183.
23. Kochevar IE, Wujek Hoover K, Gawienowski M. Benoxaprofen photosensitization of cell membrane disruption. *J Invest Dermatol.* 1984; 82:214-218.
24. Kochevar IE, Chung F-L, Jeffrey AM. Photoaddition of chlorpromazine to DNA. *Chem Biol Interact.* 1984; 51:273-284.
25. Gendimenico GJ, Kochevar IE. Degranulation of mast cells and inhibition of the response to secretory agents by phototoxic compounds and ultraviolet radiation. *Toxicol Appl Pharmacol.* 1984; 76:374-382.
26. Hasan T, Kochevar IE, Abdulah D. Amiodarone phototoxicity to human erythrocytes and lymphocytes. *Photochem Photobiol.* 1984; 40:715-719.
27. Kochevar IE. Influence of prior complex formation on the photoaddition of chlorpromazine to calf thymus DNA. *J Photochem.* 1985; 28:195-201.
28. Gange RW, Blackett AD, Matzinger E, Sutherland BM, Kochevar IE. Comparative protection efficacy of UVA and UVB induced tans against erythema and pyrimidine dimer induction by UVB in human skin. *J Invest Dermatol.* 1985; 85:362-364.
29. Kochevar IE, Morison WL, Lamm JL, McAuliffe DJ, Western A, Hood AF. Possible mechanism of piroxicam-induced photosensitivity. *Arch Dermatol* 122:1283-1287, 1986.
30. Ciulla TA, Epling GA, Kochevar IE. Photoaddition of chlorpromazine to guanosine-5'-monophosphate. *Photochem Photobiol.* 1986; 43:607-613.
31. Valdes-Aguilera O, Cincotta L, Foley J, Kochevar IE. Photobleaching of a cyanine dye in solution and in membranes. *Photochem Photobiol.* 1987; 45:337-344.
32. Green H, Boll J, Parrish JA, Kochevar IE, Oseroff AR. The cytotoxicity and mutagenicity of low intensity 248 and 193 nm excimer laser radiation in mammalian cells. *Cancer Res.* 1987; 47:410-413.
33. Green H, Margolis RJ, Boll J, Kochevar IE, Parrish JA, Oseroff AR. Unscheduled DNA synthesis in human skin after in vitro ultraviolet-excimer laser ablation. *J Invest Dermatol.* 1987; 89:201-204.

34. Western A, Van Camp JR, Bensasson R, Land EJ, Kochevar IE. Involvement of singlet oxygen in the phototoxicity mechanism for a metabolite of piroxicam. *Photochem Photobiol.* 1987; 46:469-475.
35. Valdes-Aguilera O, Ara G, Kochevar IE. Phototoxicity mechanism of a kryptocyanine dye in red blood cell membranes and isolated mitochondria. *Cancer Res.* 1988; 48:6794-6798.
36. Ciulla TA, Van Camp JR, Rosenfeld E, Kochevar IE. Photosensitization of single-strand breaks in pBR322 DNA by rose bengal. *Photochem Photobiol.* 1989; 49:293-299.
37. Fluhler EN, Hurley JK, Kochevar IE. Laser intensity and wavelength dependence of rose bengal photosensitized inhibition of red cell acetylcholinesterase. *Biochim Biophys Acta* 1989; 990:269-275.
38. Gallo RL, Kochevar IE, Granstein RD. Ultraviolet radiation induces a change in cell membrane potential in vitro: A possible signal for ultraviolet radiation induced alteration in cell activity. *Photochem Photobiol.* 1989;49:655-662.
39. Gendimenico GJ, Kochevar IE. A further characterization of acridine-photosensitized inhibition of mast cell degranulation. *Photoderm Photoimmunol Photomed.* 1990;7:51-5.
40. Kochevar IE, Walsh AA, Held KD, Gallo RL, Mirro J. Mechanism for 193-nm laser radiation-induced effects on mammalian cells. *Radiation Res.* 1990;122:142-148.
41. Kochevar IE, Buckley LA. Photochemistry of DNA using 193 nm excimer laser radiation. *Photochem Photobiol.* 1990;51:527-532.
42. Kochevar IE. UV-induced protein alterations and lipid oxidation in erythrocyte membranes. *Photochem Photobiol.* 1990;52:795-800.
43. Hefetz Y, Dunn DA, Deutsch TF, Buckley L, Hillenkamp F, Kochevar IE. Laser photochemistry of DNA: Two-photon absorption and optical breakdown using high intensity, 532-nm radiation. *J Am Chem Soc.* 1990;112:8528-8532.
44. Andley UP, Walsh A, Kochevar IE, Reddan JR. Effect of UVB radiation on protein synthesis in cultured lens epithelial cells. *Current Eye Res.* 1990;9:1099-1106.
45. Dunn DA, Lin VH, Kochevar IE. The role of ground state complexation in the electron transfer quenching of methylene blue fluorescence by purine nucleotides. *Photochem Photobiol.* 1991; 53:47-56.
46. Kochevar IE, Walsh AA, Green HA, Sherwood M, Shih AG, Sutherland BM. DNA damage induced by 193-nm radiation in mammalian cells. *Cancer Res.* 1991;288-293.
47. Allen MT, Lynch M, Lagos A, Redmond RW, Kochevar IE. A wavelength dependent mechanism for rose bengal-sensitized photoinhibition of red cell acetylcholinesterase. *Biochim Biophys Acta* 1991; 1075:42-49.

48. Dunn DA, Lin VH, Kochevar IE. Base selective oxidation and cleavage of DNA by photochemical cosensitized electron transfer. *Biochemistry* 1992;31:11620-11625.
49. Kochevar IE, Moran M, Lyon N, Flotte F, Siebert E, Gange RW. Effects of systemic indomethacin, meclizine and BW755C on chronic UVB-induced effects in hairless mouse skin. *J Invest Dermatol.* 1993;100:186-193.
50. Lilge L, Flotte TJ, Kochevar IE, Jacques SL, Hillenkamp F. Photoactivable fluorophores for the measurement of fluence in turbid media. *Photochem Photobiol* 1993;58:37-44.
51. Gut IG, Hillenkamp F, Hefetz Y, Kochevar IE. Two-photon absorption cross-sections of guanosine 5'-monophosphate and uridine 5'-monophosphate at 532 nm. *J Phys Chem.* 1993; 97:5171-5176.
52. Gut IG, Farmer R, Huang RC, Kochevar IE. Upper excited state photochemistry of DNA. *Photochem Photobiol* 1993;58:313-317.
53. Chaudhry H, Lynch M, Schomacker K, Birngruber R, Gregory K, Kochevar I. Relaxation of vascular smooth muscle induced by low power laser radiation. *Photochem Photobiol* 1993; 58:661-669.
54. Smith, G, McGimpsey WG, Lynch MC, Kochevar IE, Redmond, RW. An efficient oxygen independent two-photon photosensitization mechanism. *Photochem Photobiol* 1994;59:135-139.
55. Andley UP, Lewis RM, Reddan JR, Kochevar IE. Action spectrum for cytotoxicity in the UVA- and UVB-wavelength region in cultured lens epithelial cells. *Invest Ophthal Vis Sci* 1994; 35:367-373.
56. Kochevar IE, Moran M, Granstein RD. Experimental photoaging in C3H/HeN, C3H/HeJ, and Balb/c mice. Comparison of changes in extracellular matrix components and mast cell numbers. *J Invest Dermatol* 1994;103:797-800.
57. Kochevar IE, Bouvier J, Lynch M, Lin C-W. Influence of dye and protein location on photosensitization of the plasma membrane. *Biochim Biophys Acta* 1994;1196:172-180.
58. Garcia C, Smith G, McGimpsey WG, Kochevar IE, Redmond RW. Mechanism and solvent dependence for photoionization of promazine and chlorpromazine. *J Am Chem Soc* 1995; 117:10871-10878.
59. Aveline BM, Kochevar IE, Redmond RW. Photochemistry of N-hydroxypyridine-2-thione derivatives: Involvement of the 2-pyridylthiyl radical in the radical chain reaction mechanism. *J Am Chem Soc* 1995;117:9699-9708.
60. Aveline BM, Kochevar IE, Redmond RW. N-hydroxypyridine-2(1H)-thione: Not a selective generator of hydroxyl radical in aqueous solution. *J Am Chem Soc* 1996;118:289-290.

61. Stiel H, Techner K, Paul A, Leupold D, Kochevar IE. Quantitative comparison of excited state properties and intensity-dependent photosensitization by rose bengal. *J Photochem Photobiol* 1996; 245-254.
62. Lambert C, Stiel H, Techner K, Leupold D, Lynch M, Kochevar IE. Intensity-dependent enzyme photosensitization using ns-pulsed laser radiation. *Photochem Photobiol* 1996;63:154-160.
63. Kochevar IE, Lambert C, Lynch M, Tedesco AC. Comparison of photosensitized plasma membrane damage caused by singlet oxygen and free radicals. *Biochim Biophys Acta* 1996; 1280:223-230.
64. Schomacker KT, Walsh A, Gregory KW, Kochevar IE. Cell damage induced by Angiovis-370 and 308-nm excimer laser radiation. *Lasers Surg Med* 1997;20:111-118.
65. Lambert CR, Kochevar IE. Does rose bengal generate superoxide anion? *J Am Chem Soc* 1996;118:3297-3298.
66. Aveline BM, Kochevar IE, Redmond RW. Photochemistry of N-hydroxy-2(1H)-pyridone, a more selective source of hydroxyl radicals than N-hydroxypyridine-2(1H)-thione. *J Am Chem Soc* 1996; 118:10124-10133.
67. Aveline BM, Kochevar IE, Redmond RW. Photochemistry of the non-specific hydroxyl radical generator, N-hydroxypyridine-2(1H)-thione. *J Am Chem Soc* 1996; 118:10113-10123.
68. Lambert CR, Kochevar IE. Electron transfer quenching of the rose bengal triplet state. *Photochem Photobiol* 1997;66:15-25.
69. Redmond RW, Kochevar IE, Krieg M, Smith G, McGimpsey WG. Excited state relaxation in cyanine dyes: A remarkably efficient reverse intersystem crossing from upper triplet levels. *J Phys Chem* 1997;101:2773-2777.
70. Moor ACE, Lagerberg JWM, Tijssen K, Foley S, Truscott TG, Kochevar IE, Brand A, Dubbelman TMAR, VanSteveninck J. In vitro fluence rate effects in photodynamic reactions with ALPcS4 as sensitizer. *Photochem Photobiol* 1997;66:860-865.
71. Ibbotson SH, Lambert CR, Moran MN, Lynch MC, Kochevar IE. Benzoyl peroxide increases UVA-induced plasma membrane damage and lipid oxidation in murine leukemia L1210 cells. *J Invest Dermatol* 1998;110:79-83.
72. Kochevar IE, Garcia C, Geacintov N. Photoaddition to DNA by non-intercalated chlorpromazine molecules. *Photochem Photobiol* 1998;78:692-698.
73. Kollias N, Gillies R, Moran M, Kochevar IE, Anderson RR. Endogenous skin fluorescence includes bands that may serve as quantitative markers of aging and photoaging. *J Invest Dermatol* 1998; 111:776-780.

74. Zhuang S, Lynch MC, Kochevar IE. Activation of protein kinase C is required for protection of cells against apoptosis induced by singlet oxygen. *FEBS Letters* 1998;437:158-162.
75. So PTC, Kim H, Kochevar IE. Two-photon deep tissue ex vivo imaging of mouse skin and subcutaneous structures. *Optics Express* 1998;3:332-350.
76. Lambert CR, Kochevar IE, Redmond RW. Differential reactivity of upper triplet states produces wavelength-dependent two-photon photosensitization using rose bengal. *J Phys Chem* 1999;103:3737-3741.
77. Ibbotson SH, Moran MN, Nash JF, Kochevar IE. The effects of radicals compared with UVB as initiating species for the induction of chronic cutaneous photodamage. *J Invest Dermatol* 1999; 112:933-938.
78. Zhuang S, Lynch MC, Kochevar IE. Caspase-8 mediates caspase-3 activation and cytochrome c release during singlet oxygen-induced apoptosis of HL-60 cells. *Exp Cell Res* 1999; 250:203-212.
79. Gonzalez S, Moran MN, Kochevar IE. Chronic photodamage in skin of mast cell deficient mice. *Photochem Photobiol* 1999; 70:248-253.
80. Kochevar IE, Lynch MC, Zhuang S, Lambert CR. Singlet oxygen, but not oxidizing radicals, induces apoptosis in HL-60 cells. *Photochem Photobiol* 2000; 72:548-553.
81. Tartier L, McCarey YL, Biaglow JE, Kochevar IE, Held KD. Apoptosis induced by dithiothreitol in HL-60 cells shows activation of caspase-3 and is independent of mitochondria. *Cell Death Differen* 2000;7:1002-1010.
82. Mulroy L, Kim J, Wu I, Sharper P, Melki S, Azar DT, Redmond RW, Kochevar IE. Photochemical keratodesmos (PKD) for repair of lamellar corneal incisions. *Invest Ophth Vis Sci.* 2000; 41:3335-3340.
83. Zhuang S, Demirs JT, Kochevar IE. P38 mitogen-activated protein kinase mediates Bid cleavage, mitochondria dysfunction, and caspase-3 activation during apoptosis induced by singlet oxygen but not by hydrogen peroxide. *J Biol Chem* 2000; 275:25939-25948.
84. Lin CP, Lynch MA, Kochevar IE. Reactive oxidizing species produced near the plasma membrane induce apoptosis in bovine aorta endothelial cells. *Exp Cell Res* 2000; 259:351-359.
85. Zhuang S, Demirs JT, Kochevar IE. Protein kinase C inhibits singlet oxygen-induced apoptosis by decreasing caspase-8 activation. *Oncogene.* 2000; 20:6764-6776.
86. Wong W-R, Kossodo S, Kochevar IE. Influence of cytokines on matrix metalloproteinases produced by fibroblasts cultured in monolayer and collagen gels. *J Formos Med Assoc* 2001; 100:377-382.
87. Chan BP, Kochevar IE, Redmond RW. Enhancement of porcine skin graft adherence using a light-activated process. *J Surg Res* 2002; 108:77-84.

88. Nguyen B, Kochevar IE. Influence of hydration on dihydroxyacetone-induced pigmentation of stratum corneum. *J Invest Dermatol* 2003; 120:665-661.
89. Nguyen B, Kochevar IE. Factors influencing sunless tanning with dihydroxyacetone. *Br J Dermatol* 2003; 149: 332-340.
90. Zhuang S, Ouedraogo GD, Kochevar IE. Down-regulation of epidermal growth factor receptor signaling by singlet oxygen through activation of caspase-3 and protein phosphatases. *Oncogene*, 2003; 22:4413-4424.
91. Zhuang S, Kochevar IE. Ultraviolet A radiation induces rapid apoptosis of human leukemia cells by Fas ligand-independent activation of the Fas death pathway. *Photochem Photobiol* 2003; 78:61-67.
92. Zhuang S, Kochevar IE. Singlet oxygen-induced activation of Akt/protein kinase B is independent of growth factor receptors. *Photochem Photobiol* 2003; 78:361-371.
93. Kossodo S, Wong W-R, Simon G, Kochevar IE. Effects of UVR and UVR-induced cytokines on production of extracellular matrix proteins and proteases by dermal fibroblasts cultured in collagen gels. *Photochem Photobiol* 2004; 79: 80-87.
94. Proano CE, Azar DT, Mocan MC, Redmond RW, Kochevar IE. Photochemical keratodesmos (PKD) as an adjunct to sutures for bonding penetrating keratoplasty corneal incisions. *J Cataract Refrac Surg* 2004; 30:2420-2424.
95. Proano CE, Mulroy L, Jones E, Azar DT, Redmond RW, Kochevar IE. Photochemical keratodesmos for bonding corneal incisions. *Invest Ophthalmol Vis Science* 2004; 45:2177-2181.
96. Chan BP, Amann C, Yaroslavsky AN, Title C, Smink D, Zarins B, Kochevar IE, Redmond RW. Photochemical repair of Achilles tendon rupture in a rat model. *J Surg Res.* 2005;124:274-9.
97. Wang H, Kochevar IE. Involvement of UVB-induced reactive oxygen species in TGF- β biosynthesis and activation in keratinocytes. *Free Radical Biol Med.* 2005; 38:890-897.
98. Kamegaya Y, Farinelli WA, Vila Echague AV, Akita H, Gallagher J, Flotte TJ, Anderson RR, Redmond RW, Kochevar IE. An evaluation of photochemical tissue bonding for closure of skin incisions and excisions. *Lasers Surg Med.* 2005; 37:264-270.
99. Valencia A, Kochevar IE. UVA induces apoptosis via reactive oxygen species in a model for Smith-Lemli-Opitz syndrome. *Free Radical Biol Med.* 2006; 40:641-650.
100. Valencia A, Rajaduari A, Carle AB, Kochevar IE. 7-Dehydrocholesterol enhances ultraviolet A-induced oxidative stress in keratinocytes: Roles of NADPH oxidase, mitochondria and lipid rafts. *Free Radical Biol Med.* 2006; 41:1704-1718.

101. Johnson TS, O'Neill AC, Motarjem P, Amman C, Zeballos JL, Bujold KE, Nguyen T, Randolph MA, Winograd JM, Kochevar IE, Redmond RW. Photochemical tissue bonding: A novel technique in peripheral nerve repair. *J Surg. Res.* 2007; 143:224-229.
102. Ibusuki S, Halbesma GJ, Randolph MA, Redmond RW, Kochevar IE, Gill TJ. Photochemically cross-linked collagen gels as three-dimensional scaffolds for tissue engineering. *Tissue Eng.* 2007; 13:1995-2001
103. Valencia A, Kochevar IE. Nox1-based NADPH oxidase is the major source of UVA-induced reactive oxygen species in human keratinocytes. *J Invest Dermatol.* 2008; 128: 214-22.
104. O'Neill AC, Winograd JM, Zeballos JL, Johnson TS, Randolph MA, Bujold KE, Kochevar IE, Redmond RW. Microvascular anastomosis using a photochemical tissue bonding technique. *Lasers Surg Med.* 2007; 39:716-722.
105. Bargagna-Mohan P, Mohan R, Russo L, Kochevar IE, Fini ME. Cell lines and transgenic mice expressing a matrix metalloproteinase-9 promoter-driven reporter gene: potential for assay of ultraviolet light effects and light-inhibiting compounds. *Cutan Ocul Toxicol.* 2007;26:383-397.
106. O'Neill AC, Randolph MA, Bujold KE, Kochevar IE, Redmond RW, Winograd JM. Photochemical sealing improves outcome following peripheral neurotomy. *J Surg Res.* 2009;151(1):33-9.
107. Henry FP, Cote D, Randolph MA, Rust EAZ, Redmond RW, Kochevar IE, Lin CP, Winograd JM. Real time in vivo assessment of the nerve microenvironment with coherent anti-Stokes Raman scattering microscopy. *Plast Reconstr Surg.* 2009;123(2 Suppl):123S-30S.
108. Henry FP, Goyal NA, David WS, Wes D, Bujold KE, Randolph MA, Winograd JM, Kochevar IE, Redmond RW. Improving electrophysiological and histological outcomes by photochemically sealing amnion to the peripheral nerve repair site. *Surgery.* 2009;145(3):313-21. Epub 2009 Jan 25.
109. O'Neill AC, Randolph MA, Bujold KE, Kochevar IE, Redmond RW, Winograd JM. Preparation and integration of human amnion nerve conduits using a light-activated technique. *Plast Reconstr Surg.* 2009;124(2):428-37.
110. Ibusuki S, Papadopoulos A, Ranka MP, Halbesma GJ, Randolph MA, Redmond RW, Kochevar IE, Gill TJ. Engineering cartilage in a photochemically crosslinked collagen gel. *J Knee Surg.* 2009 Jan;22(1):72-81.
111. Yamaura M, Yao M, Yaroslavsky I, Cohen R, Smotrich M, Kochevar IE. Low level light effects on inflammatory cytokine production by rheumatoid arthritis synoviocytes. *Lasers Surg Med.* 2009;41(4):282-90.
112. Choi WS, Mitsumoto A, Kochevar IE. Involvement of reactive oxygen species in TGF- β -induced tropoelastin expression by human dermal fibroblasts. *Photochem Photobiol.* 2009; 85(6):1425-33.

113. Yao M, Yaroslavsky A, Henry F, Redmond RW, Kochevar IE. Phototoxicity is not associated with photochemical tissue bonding of skin. *Lasers Surg Med.* 2010; 42(2):123-131.
114. Venditti E, Brugè F, Astolfi P, Kochevar I, Damiani E. Nitroxides and a nitroxide-based UV filter have the potential to photoprotect UVA-irradiated human skin fibroblasts against oxidative damage. *J Derm Sci.* 2011; 63(1):55-61.
115. Franco RA, Dowdall JR, Bujold K, Amann C, Faquin W, Redmond RW, Kochevar IE. Photochemical repair of vocal fold microflap defects. *Laryngoscope.* 2011;121(6):1244-51.
116. Gu C, Ni T, Verter EE, Redmond RW, Kochevar IE, Yao M. Photochemical tissue bonding: A potential strategy for treating limbal stem cell deficiency. *Lasers Surg Med.* 2011; 43(5):433-442.
117. Belanger E, Henry FP, Vallee R, Randolph MA, Kochevar IE, Winograd JM, Lin CP and Cote D. *In vivo* evaluation of demyelination and remyelination in a nerve crush injury model. *Biomed Optics Express* 2011; 2(9):2698-2708.
118. Wang Y, Kochevar IE, Redmond RW, Yao M. A light-activated method for repair of corneal surface defects. *Lasers Surg Med.* 2011;43(6):481-9.
119. Verter EE, Gisel TE, Yang P, Johnson AJ, Redmond RW, Kochevar IE. Light-initiated bonding of amniotic membrane to cornea. *Invest Ophthalmol Vis Sci.* 2011;52(13):9470-7.
120. Tsao S, Yao M, Tsao H, Henry FP, Zhao Y, Kochevar JJ, Redmond RW, Kochevar IE. Light-activated tissue bonding for excisional wound closure: A split-lesion clinical trial. *Br J Dermatol.* 2012;166(3): 555-563.
121. Yang P, Yao M, DeMartelaere SL, Redmond RW, Kochevar IE. Light-activated sutureless closure of wounds in thin skin. *Lasers Surg Med.* 2012;44(2):163-167.
122. Ni T, Senthil-Kumar P, Dubbin K, Aznar-Cervantes S, Datta N, Randolph MA, Cenis J, Rutledge G, Kochevar I, Redmond R. A photo-activated nanofiber graft material for augmented Achilles tendon repair. *Lasers Surg Med* 2012;44(8):645-52.
123. Senthil-Kumar P, Ni T, Randolph MA, Velmahos GC, Kochevar IE, Redmond RW. A photochemically-bonded amnion wrap strengthens colonic anastomotic lines and reduces peri-anastomotic adhesions. *Surgery* 2013 (in press)
124. Cherfan D, Verter EE, Melki S, Gisel TE, Doyle FJ, Scarcelli G, Yun SH, Redmond RW, Kochevar IE. Collagen cross-linking using Rose Bengal and green light to increase corneal stiffness. *Invest Ophthalmol Vis Sci,* 2013;54(5):3426-33.
125. Yao M, Gu C, Doyle FJ, Zhu H, Redmond RW, Kochevar IE. Why is Rose Bengal more phototoxic to fibroblasts in vitro than in vivo. *Photochem Photobiol,* 2014;90(2):297-305.

126. Liu C, Chen Y, Kochevar IE, Jurkunas U. Decreased DJ-1 leads to impaired Nrf2-regulated antioxidant defense and increased UVA-induced apoptosis in corneal endothelial cells. *Invest Ophthalmol Vis Sci*, 2014;55(9):5551-60.
127. Xu N, Yao M, Franelli W, Hajjarian Z, Wang Y, Redmond RW, Kochevar IE. Light-activated sealing of skin wounds. *Lasers Surg Med* 2015;47(1):17-29.
128. Marcos S, Alejandre N, Lamela J, Dorronsoro C, Kochevar IE. Towards new engagement paradigms for intraocular lenses: light-initiated bonding of capsular bag to lens materials. *Invest Ophthalmol Vis Sci*, 2015; 56(8):4249-56.
129. Bekesi N, Kochevar IE, Marcos S. Corneal Biomechanical Response Following Collagen Cross-Linking With Rose Bengal–Green Light and Riboflavin-UVA. *Invest Ophthalmol Vis Sci*, 2016;57(3):992-1001.
130. Fairbairn NG, Ng-Glazier J, Meppelink AM, Randolph MA, Valerio IL, Fleming ME, Kochevar IE, Winograd JM, Redmond RW. Light-activated sealing of acellular nerve allografts following nerve gap injury. *J Reconstr Microsurg*, 2016;32(6):421-30. doi: 10.1055/s-0035-1571247.
131. Liu C, Vojnovic D, Kochevar IE, Jurkunas UV. UV-A Irradiation Activates Nrf2-Regulated Antioxidant Defense and Induces p53/Caspase3 Dependent Apoptosis in Corneal Endothelial Cells. *Invest Ophthalmol Vis Sci*, 2016;57(4):2319-27.
132. Senthil-Kumar P, Ni T, Randolph MA, Velmahos GC, Kochevar IE, Redmond RW. A light-activated amnion wrap strengthens colonic anastomosis and reduces peri-anastomotic adhesions. *Lasers Surg Med* 2016;48(5):530-7.
133. Zhu H, Alt C, Webb RW, Melki S, Kochevar IE. Cornea crosslinking with Rose Bengal and green light: Efficacy and safety evaluation. *Cornea* 2016;35(9):1234-41.
134. Fadlallah A, Zhu H, Arafat S, Kochevar I, Melki S, and Ciolino JB. Corneal resistance to keratolysis after collagen crosslinking with rose bengal and green light. *Invest Ophthalmol Vis Sci*. 2016;57:6610–6614. DOI: 10.1167.
135. Ni T, Senthil-Kumar P, Dubbin K, Aznar-Cervantes SD, Datta N, Randolph MA, Cenis JL, Rutledge GC, Kochevar IE, Redmond RW. A photoactivated nanofiber graft material for augmented Achilles tendon repair. *Lasers Surg Med*. 2016;44(8):645-52. doi: 10.1002
136. Bekesi N, Gallego-Munoz P, Ibares-Frias L, Perez-Merino P, Martinez-Garcia C, Kochevar IE, Marcos S. Biomechanical changes after in vivo collagen cross-linking with rose Bengal-green light and riboflavin-UVA. *Invest Ophthalmol Vis Sci*. 2017;58(3):1612-1620.
137. Pupkaite J, Ahumada M, Mclaughlin S, Temkit M, Alaziz S, Seymour R, Ruel M, Kochevar I, Griffin M, Suuronen EJ, Alarcon EI. Collagen-based photoactive agent for tissue bonding. *ACS Appl Mater Interfaces*. 2017;22;9(11):9265-9270. doi: 10.1021.

138. Zhu H, Kochevar IE, Behleau I, Zhao J, Wang F, Wang Y, Sun X, Hamblin MR, Dai T. Antimicrobial blue light therapy for infectious keratitis: ex vivo and in vivo studies. *Invest Ophthalmol Vis Sci* 2017;58:586-593.
139. Kwok SJJ, Kim M, Lin HH, Seiler TG, Beck E, Shao P, Kochevar IE, Seiler T, Yun SH. Flexible optical waveguides for uniform periscleral cross-linking. *Invest Ophthalmol Vis Sci*. 2017;58(5):2596-2602.
140. Senthil-Kumar P, Ng-Glazier JH, Randolph MA, Bodugoz-Senturk H, Muratoglu OK, Kochevar IE, Winograd JM, Redmond RW. An intraluminal stent facilitates light-activated vascular anastomosis. *J Trauma Acute Care Surg*. 2017;83(1 Suppl 1):S43-S49. doi: 10.1097/TA.000000000000148
141. Soeken TA, Zhu H, DeMartelaere S, Daview BW, Kim M, Wang H-C, Aden J, Grimm R, Alt C, Cho R, Kochevar IE, Johnson AJ. Sealing of Corneal Lacerations Using Photo-Activated Rose Bengal Dye and Amniotic Membrane. *Cornea*, 2018;37(2):211-217.
142. Gallego-Muñoz P, Ibares-Frias L, Lorenzo E, Marcos S, Pérez-Merino, Bekesi N, Kochevar IE, Martínez-García MC. Corneal Wound Repair after Rose Bengal and Green Light Cross-linking: Clinical and Histological Study. *Invest Ophthalmol Vis Sci*. 2017;58(9): 3471-3480.
143. Ortega-Martinez A, Touchette G, Zhu H, Kochevar IE, Franco W. Variations in the endogenous fluorescence of rabbit corneas after mechanical property alterations. *J Biomed Optics* 2017;22(9):1-7. doi: 10.1117/1
144. Alarcon EI, Poblete P, Roh, H-G, Couture J-F, Comer J, and Kochevar IE. Rose Bengal Binding to Collagen and Tissue Photobonding. *ACS Omega* 2017;2(10), 6646–6657. DOI: 10.1021
145. Seiler TG, Engler M, Beck E, Birngruber R, Kochevar IE. Interface bonding with corneal crosslinking (CXL) after laser in situ keratomileusis (LASIK) ex vivo. *Invest Ophthalmol Vis Sci*. 2017: 58(14):6292-6298

[Non-peer reviewed scientific or medical publications/materials in print or other media](#)

1. Brewer D, Kochevar IE, Shields J, Schuster G, Turro NJ. Organic photochemistry, 1974. *Mol Photochem*. 1976; 7:85-129.
2. Kochevar IE. Phototoxicity mechanisms: Chlorpromazine photosensitized damage to DNA and cell membranes. *J Invest Dermatol*. 1981; 76:59-64.
3. Harber L, Bickers D, Kochevar I. Introduction to ultraviolet and visible radiation. In: Harber LC, Bickers DR. *Photosensitivity Diseases; Principles of Diagnosis and Treatment*. Philadelphia: WB Saunders, 1981:13-23.

4. Kochevar I, Harber L, Bickers D. Principles of light absorption and photochemistry. In: Harber LC, Bickers DR. Photosensitivity Diseases; Principles of Diagnosis and Treatment. Philadelphia: WB Saunders, 1981:24-32.
5. Kochevar I, Bickers D, Harber L. The photochemistry of cutaneous molecules. In: Harber LC, Bickers DR. Photosensitivity Diseases; Principles of Diagnosis and Treatment. Philadelphia: WB Saunders, 1981:33-41.
6. Harber LC, Kochevar IE, Bickers DR. Photometers. In: Harber LC, Bickers DR. Photosensitivity Diseases; Principles of Diagnosis and Treatment. Philadelphia: WB Saunders, 1981:258-263.
7. Harber LC, Kochevar IE, Shalita AR. Mechanisms of photosensitization to drugs in humans. In: Parrish JA, Regan J. The Science of Photomedicine. New York: Plenum Publishing, 1982:323-347.
8. Harber LC, Bickers DR, Armstrong RB, Kochevar IE. Drug photosensitivity; phototoxic and photoallergic mechanisms. In: Rook AJ, Maibach HI, eds. Seminars in Dermatology, 1982; 1:183-196.
9. Kochevar IE. Basic concepts in photobiology. In: Parrish JA, Morison WL, Kripke M, eds. Photoimmunology. New York: Plenum Publishing, 1983:5-21.
10. Kochevar IE, Anderson RR. Experimental techniques in photoimmunology. In: Parrish JA, Morison WL, Kripke M, eds. Photoimmunology. New York: Plenum Publishing, 1983:51-60.
11. Kochevar IE. Photobiologic mechanisms in photoimmunology: membrane alterations and photoallergy. Proceedings of Symposium on the Effects of Ultraviolet Light on the Immune System, Albuquerque, June 25-26, 1982. Skillman, New Jersey: Johnson and Johnson Press, 1983:145-159.
12. Morison WL, Kochevar IE. Photoallergy. In: Parrish JA, Morison WL, Kripke M, eds. Photoimmunology. New York: Plenum Publishing, 1983:227-253.
13. Kochevar IE, Gange RW. Cutaneous photobiology. Yearly Review. Photochem Photobiol. 1983; 37:695-700.
14. Kochevar IE, Pathak MA, Parrish JA. Photophysics, photochemistry and photobiology. In: Fitzpatrick TB, et al, eds. Dermatology in General Medicine, 3rd Edition. New York: McGraw-Hill, 1986; 1441-1450.
15. Bernhard JD, Pathak MA, Kochevar IE, Parrish JA. Abnormal reactions to ultraviolet radiation. In: Fitzpatrick TB, et al, eds. Dermatology in General Medicine, 3rd Edition. New York: McGraw-Hill, 1986; 1481-1506.
16. McAuliffe DJ, Hasan T, Kochevar IE, Parrish JA. Determination of photosensitivity by an in vitro assay as an alternative to animal testing. In: Goldberg AM, ed. Alternative Methods in Toxicology, Volume 3. New York: Mary Ann Liebert, Inc., 1985; 31-41.

17. Kochevar IE. Action spectrum and mechanisms of UVR-induced injury in lupus erythematosus. Proceedings of the 34th Symposium on the Biology of the Skin, Salishan, Oregon, October, 1984; J Invest Dermatol. 1985; 85:140s-143s.
18. Kochevar IE. Mechanism of UVA photosensitization. In: Urbach F, Gange RW, eds. Biological Effects of UVA. Praeger Press, 1985; pp. 87-97.
19. Kochevar IE. Photobiology: Basic Science. Dermatologic Clinics 1985; 4:171-179.
20. Kochevar IE, Western A, McAuliffe DJ. Further testing of an in vitro phototoxicity assay. In: Goldberg AM, ed. Alternative Methods in Toxicology, Volume 5. New York: Mary Ann Liebert, Inc., 1986.
21. Kochevar IE. Mechanisms of drug photosensitization. Photochem Photobiol. 1987; 45:891-895.
22. Kochevar IE, Dunn DA. Photosensitized reactions of DNA: Cleavage and addition. In: Morrison H, ed. Bio-Organic Photochemistry. Photochemistry Involving The Nucleic Acids. New York: Wiley-Interscience, 1989, pp. 273-315.
23. Kochevar IE. Phototoxicity of NSAIDs: Coincidence or specific mechanism? Arch Derm. 1989; 125:824-826.
24. Kochevar IE. Cytotoxicity and mutagenicity of excimer laser radiation. Lasers Surg Med. 1989; 9:440-444.
25. Kochevar IE, Hefetz Y, Dunn DA, Deutsch TF, Buckley L, Hillenkamp F. DNA photoproducts formed using high intensity 532-nm laser radiation. In: Laser Applications in the Life Sciences . SPIE Proceedings, 1403:26, 1990.
26. Lilje L, Flotte TJ, Kochevar IE, Foley JW, Wilson BC. A fluorescent-tip optical fiber probe for quantitative light dosimetry in light scattering media and in tissue. In: SPIE Proceedings, 1203:106-117, 1990.
27. Kochevar IE. Mechanisms of phototoxicity for nonsteroidal anti-inflammatory drugs. In: Urbach F, ed. Biological Effects of UVA Radiation, Vol. 2. Kansas City: Valdemar Press, 1991, pp. 101-106.
28. Kochevar IE. Acute effects of ultraviolet light in skin. In: Holick MF, Kligman AM, eds. Biologic Effects of Light. Berlin: Walter de Gruyter, 1992.
29. Kochevar IE. Principles of photobiology. In: DeLeo VA, ed. Photosensitivity. New York: Igaku-Shain, 1992, pp. 9-24.
30. Kochevar IE. Biological effects of excimer laser radiation. Proceedings of the IEEE 1992; 80:833-837.
31. Peak MJ, Kochevar IE, Peak JG. Solar ultraviolet radiation effects on mammalian cell DNA. In: Fuchs J, Packer L, eds. Oxidative Stress in Dermatology. New York: Marcel Dekker, 1992, pp. 169-186.

32. Kochevar IE, Pathak MA, Parrish JA. Photophysics, photochemistry and photobiology. In: Fitzpatrick TB et al., eds. *Dermatology in General Medicine*, 4th Edition. New York: McGraw-Hill, 1993, pp. 1627-1637.
33. Kochevar IE. Basic principles in photomedicine and photochemistry. In: Soter N and Lim H, eds. *Clinical Photomedicine*. New York: Marcel Dekker, 1993, pp. 9-24.
34. Kochevar IE. Primary processes in photobiology and photosensitization. In: Krutman J and Elmetts C, eds. *Photoimmunology: An Update*. New York: Blackwell, 1995, pp. 19-33.
35. Kochevar IE. Molecular and cellular effects of ultraviolet radiation relevant to chronic photodamage. In: Gilchrest BA, ed. *Photodamage*. New York. Blackwell Scientific Publishers, 1995, pp. 51-67.
36. Kochevar IE, Redmond RW. Photosensitized generation of singlet oxygen. In: Packer L, Sies H, ed. *Singlet oxygen, UV-A & Ozone. Methods in Enzymology*, 2000; 319:20-28.
37. Kochevar IE, Taylor CT. Photophysics, photochemistry and photobiology. In: Freedberg IM, Eisen AZ, Wolff K, Austen KF, Goldsmith LA, Katz SI eds. *Dermatology in General Medicine*, 6th Edition. New York: McGraw-Hill, 2002, pp.1267-1274.
38. Kochevar IE. Apoptosis mechanisms initiated by oxidative stress. In: Torres M, Fukuto J and Forman H eds. *Signal Transduction by Reactive Oxygen and Nitrogen Species: Pathways and Chemical Principles*, Kluwer Publishers, 2003, pp. 365-378.
39. Kochevar IE. Singlet Oxygen Signaling: From Intimate to Global. *Sci STKE*. 2004 Feb 17; 2004 (221).
40. Diffey BL, Kochevar IE. Basic principles of photobiology. In: Lim H, Honigsmann H, Hawk J eds. *Principles and Practice of Photodermatology*, Taylor and Francis, 2006. Pp. 15-28.
41. Redmond RW, Kochevar IK. Spatially-resolved responses to singlet oxygen. *Photochem Photobiol*. 2006, 82:1178-1186.
42. Kochevar IE, Taylor CT, Krutmann J. Introduction to Photobiology and Photoimmunology. In: Wolff, K, Goldsmith LA, Katz SI, Gilchrest B, Paller AS, Leffell DJ, eds. *Dermatology in General Medicine*, 7th Edition. New York: McGraw-Hill, 2007.
43. Kochevar IE, Taylor CT, Krutman J. Fundamentals of Cutaneous Photobiology and Photoimmunology. In: Goldsmith L, Katz S, Gilchrest B, Paller A, Leffell D, Wooff, eds. *Dermatology in General Medicine*, 8th Edition. New York: McGraw-Hill, 2012.
44. Kochevar IE and Redmond RW. Light-activated wound healing and tissue modification. *The Biochemist*, The Biochemical Society, 39 (6) 2016, pp. 20-23

Thesis

A kinetic study of the quenching of triplet ketenes by mono-olefins. Michigan State University, 1970.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

No record kept of abstracts and posters.

Narrative Report (limit to 500 words)

My laboratory has focused on understanding the normal and pathological effects of light (UV/visible) on human tissue (mainly skin) and using this knowledge to develop light-initiated therapies. Educated in physical organic chemistry, photochemistry and biochemistry, I began my independent research career more than 35 years ago. Starting with studies of the photochemical mechanisms underlying drug phototoxicity responses, the research evolved toward phototherapies. Concurrently we studied the effects of UV radiation on cells with special emphasis on cell signaling initiated at the plasma membrane and processes leading to chronic UV-induced skin damage. For the last 10 years, in collaboration with Robert Redmond PhD at the Wellman Center, we developed a light-activated technology for tissue repair based on photo-crosslinking tissue proteins. Studies carried out *ex vivo* and *in vivo* in tissues have demonstrated its utility for a wide range of tissue repair and examined the molecular mechanism.

Drug phototoxicity /therapeutic photosensitization. Both of these phenomena, although one is deleterious and the other beneficial, involve formation and reactions of singlet oxygen. One focus has been the formation of singlet oxygen in and near the cell plasma membrane, for example, by selective delivery of light to this region using evanescent waves. We established signaling pathways by which singlet oxygen stimulates and/or damages cells. Examples include: 1) Demonstrated differences in cell death mechanisms initiated by singlet oxygen versus hydrogen peroxide. 2) Established that singlet oxygen down-regulates EGFR signaling by activating caspase-3 and protein phosphatases. 3) Determined that protein kinase C inhibits singlet oxygen-induced apoptosis by decreasing caspase-8 activation.

UV radiation-initiated responses. In addition to the mutagenic effects of UV that are initiated by DNA damage, reactive oxygen species (ROS) are produced in skin exposed to solar UV. These ROS contribute to acute effects (inflammation) and chronic damage (photoaging and photocarcinogenesis). Our goal was to reduce the damaging effects of ROS on skin. Two examples: 1) While studying the mechanisms for the UVA photosensitivity in Smith-Lemli-Optiz syndrome, we identified Nox1 as a source of UVA-initiated ROS formation in keratinocytes thus providing a therapeutic target. 2) In investigations of solar elastosis, a prominent sign of chronic skin photodamage, we established that ROS mediate TGF- β initiated elastin production.

Light-activated tissue repair. This project was initiated in response to the need for a rapid, water-tight, sutureless method for closing skin wounds and other damaged tissue requiring adhesion between tissue surfaces. We demonstrated that light-activated linking of proteins between the tissue surfaces addressed this need. In Photochemical Tissue Bonding (PTB) a photoactive dye is applied to tissue surfaces and irradiated with visible light to covalently crosslink proteins without toxicity or inflammation. PTB was superior to sutures for closure of skin wounds (including a 30-patient study) and for reconnecting peripheral nerves, blood vessels and tendons in animal studies. In cornea, PTB rapidly sealed penetrating wounds and attached amniotic membrane transplants and limbal stem cells. More recently we have used light-activated protein crosslinking within, rather than between, tissues to strengthen the tissue or change its properties. An example is photo-crosslinking collagen in cornea as a treatment for keratoconus. Light-

activated tissue repair remains an active area of research including identifying mechanisms in order to enhance the efficiency of PTB.