CURRICULUM VITAE: STEEN J. MADSEN, Ph.D.

University of Nevada, Las Vegas
Department of Health Physics
4505 Maryland Parkway, Box 453037
Las Vegas, NV 89154-3037
Phone: 702.895.1805
Fax: 702.895.4819
email: steen.madsen@unlv.edu

PERSONAL DATA

Place of birth: Copenhagen, Denmark
Nationality: U.S. / Canadian (dual)

PROFESSIONAL EXPERIENCE

07/11-present	Tony and Renee Marlon Professorship
07/10	Professor, Department of Health Physics and Diagnostic Sciences, University of Nevada, Las Vegas
11/09-present	Visiting Researcher, Beckman Laser Institute, University of California, Irvine
05/06 – 01/13	Adjunct Member, Nevada Cancer Institute
01/05 – 01/08	Adjunct Faculty, Dept. of Chemistry, University of Nevada, Las Vegas
07/04 – present	Chair, Department of Health Physics, University of Nevada, Las Vegas
04/03 – 06/10	Associate Professor, Department of Health Physics, University of Nevada, Las Vegas.
03/99	Founding member of the University of Nevada, Las Vegas Cancer Institute.
09/98 – present	Director, Comprehensive Medical Imaging Program, University of Nevada, Las Vegas
09/97 – 04/03	Assistant Professor, Department of Health Physics, University of Nevada, Las Vegas.

09/97 – 09/03	Visiting researcher at the Beckman Laser Institute and Medical Clinic, University of California, Irvine.
07/95 – 06/97	Medical Physics Resident, Radiation Oncology Center, Mallinckrodt Institute of Radiology, Washington University Medical Center.
01/93 - 06/95	Postdoctoral Fellow in Photomedicine, Beckman Laser Institute and Medical Clinic, University of California, Irvine.

EDUCATION

B.Sc. (Physics & Biology): University of Toronto 1982-1986.
M.Sc. (Health & Radiation Physics): McMaster University 1986-1988.

Thesis title: "A Remote Electro-optical Technique for Monitoring Singlet Oxygen Generation During Photodynamic Therapy"
Supervisor: Dr. Michael S. Patterson

Ph.D. (Medical Physics): McMaster University 1989-1993.

Thesis title: "Experimental Studies of Time-resolved Light Propagation in Turbid Media"
Supervisor: Dr. Michael S. Patterson
Co-Supervisor: Dr. Brian C. Wilson

HONORS AND AWARDS

First Annual Radiology Research Day, first prize (with M.S. Patterson and B.C. Wilson), Hamilton, October 1988.

Second Annual Radiology Research Day, second prize (with M.S. Patterson and B.C. Wilson), Hamilton, October 1989.

Fourth Annual Radiology Research Day, first prize (with M.S. Patterson and B.C. Wilson), Hamilton, November 1991.

McMaster University Departmental Fellowship, McMaster University, 1986-1991.

American Society of Therapeutic Radiology and Oncology (ASTRO) Fellowship in Medical Physics, 1995.

Outstanding Scholar Award, College of Health Sciences, UNLV (April, 2002).
Outstanding Scholar Award, School of Allied Health Sciences, UNLV (April, 2007).

GRANTS

Effects of photodynamic therapy on human brain tumors
Principal Investigator: Steen Madsen
Agency: University of Nevada, Las Vegas
Type: S.I.T.E Grant *Period:* 05/01/98 – 04/30/99
The overall objective of this project was to investigate the response of human glioma spheroids to ALA-mediated PDT using different light delivery schemes.

Establishment of the UNLV Cancer Institute
Co-Principal Investigator: Steen Madsen
Agency: University of Nevada, Las Vegas
Type: Planning Initiative Award *Period:* 02/01/99 – 01/31/00
The overall objective of this project was to establish the UNLV Cancer Institute.

Light and thermal distributions in the brain during photodynamic therapy
Principal Investigator: Steen Madsen
Agency: University of Nevada, Las Vegas
Type: S.I.T.E Grant *Period:* 05/01/00 – 04/30/01
The overall objective of this project was to model light and thermal distributions in the human brain during photodynamic therapy.

Combined photodynamic and radiation therapy of brain tumors
Principal Investigator: Steen Madsen
Agency: State of Nevada
Type: Applied Research Initiative *Period:* 10/01/00 – 09/30/02
The overall objective of this project was to investigate the response of human glioma spheroids to combined photodynamic therapy and ionizing radiation.

Treatment of glioblastoma multiforme using photodynamic therapy
Co-Investigator: Steen Madsen
Agency: Four Seasons/Terry Fox Research Grant
Type: Research Grant *Period:* 3/01/01 – 2/28/02
The aim of this work was to investigate the utility of ALA-mediated photodynamic therapy in a rat brain tumor model.
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Biodistribution of hexylester aminolevulinic acid in the rat brain
Principal Investigator: Steen Madsen
Agency: PhotoCure ASA
Type: Industry-sponsored research grant *Period:* 4/01/02 – 3/31/03
The overall objective of this work was to evaluate the biodistribution of a novel lipophilic photosensitizer in a rat brain tumor model.

Repetitive photodynamic therapy for the treatment of rat brain tumors
Principal Investigator: Steen Madsen
Agency: American Cancer Society

Type: Institutional Research Grant *Period:* 9/15/03 – 9/14/05
The goal of this work was to investigate the efficacy of fractionated ALA Photodynamic therapy in human glioma spheroids.

The effects of photodynamic therapy on brain tumor stem cells
Principal Investigator: Steen Madsen
Agency: State of Nevada
Type: Applied Research Initiative Grant *Period:* 10/01/05 – 9/30/06
The overall objective of this project is to isolate brain tumor stem cells and determine their sensitivity to photodynamic therapy.

Development of a radioanalytical counting laboratory for support of education and evaluation of environmental samples
Co-Principal Investigator: Steen Madsen
Agency: U.S. Dept of Energy
Type: Infrastructure Grant *Period:* 10/01/05 – 9/30/08
The purpose of this grant is to establish a radioanalytical laboratory for educational purposes and for evaluation of environmental samples on a fee-for-service basis.

Border intelligence and detection system
Co-Principal Investigator: Steen Madsen
Agency: State of Nevada
Type: Applied Research Initiative Grant *Period:* 10/01/05 – 9/30/06
The objective of this project is to construct an airborne radiation monitoring system for homeland security applications and other aerial surveillance applications.

The use of Motexafin Gadolinium as a contrast agent in intraoperative magnetic resonance imaging
Principal Investigator: Steen Madsen
Agency: Pharmacyclics, Inc.
Type: Industry-sponsered research grant *Period:* 12/01/05 – 11/30/06
The aim of this project is to investigate the utility of a novel contrast agent in rat brains.

Selective disruption of the blood-brain-barrier by photochemical internalization
Principal Investigator: Steen Madsen
Agency: Nevada Cancer Institute
Type: Hospital-sponsored research grant *Period:* 7/01/06 – 6/30/07
The aim of this project is to examine novel methods for the local disruption of the blood-brain-barrier.

Research into novel radioanalytical methods for attribution science and environmental analysis in support of radiochemistry education and research
Principal Investigator: Steen Madsen
Agency: US Dept. of Energy
Type: Infrastructure grant *Period:* 7/01/06 – 6/30/09

The overall objective of this grant is to further the establishment of a laboratoy facility capable of evaluating radionuclide concentrations in a variety of environmental or bioassay matrices.

Research into novel radioanalytical methods for attribution science and environmental analysis in support of radiochemistry education and research (supplement)
Principal Investigator: Steen Madsen
Agency: US Dept. of Energy
Type: Infrastructure grant *Period:* 7/01/07 – 6/30/08
The overall objective of this grant is to further the establishment of a laboratoy facility capable of evaluating radionuclide concentrations in a variety of environmental or bioassay matrices.

Treatment of malignant brain tumors using viral and non-viral PAX6 gene therapy and photochemical internalization
Co-Principal Investigator: Steen Madsen
Agency: Norwegian Cancer Society
Type: Research grant *Period:* 6/01/07 – 5/31/08
This grant focuses on novel therapeutic approaches for the treatment of malignant gliomas.

Macrophage-mediated delivery of nanoparticles for photothermal ablation of malignant gliomas
Co-Principal Investigator: Steen Madsen
Agency: The Nevada Health Sciences System
Type: Research grant *Period:* 1/01/09 – 12/31/09

A point-of-care immuno-biosensor for multiple cardiac biomarkers detection
Co-Principal Investigator: Steen Madsen
Agency: The Nevada Health Sciences System
Type: Research grant *Period:* 1/01/09 – 12/31/09

CLINICAL EXPERIENCE

- Oversight and coordination of treatment planning, simulation, and treatment delivery activities for external beam radiotherapy and brachytherapy. Weekly chart checks, computer generated isodose plan review and other medical physics consultations.

- Periodic quality assurance for linear accelerators, simulators, CT-simulators, superficial, contact therapy machines and remote afterloading HDR and LDR units.

- Calibration of photon and electron beams of linear accelerators, as well as photon beams of superficial and contact therapy machines.

- Calibration of remote afterloading HDR sources with in-air measurement and LDR sources using a well chamber.

- Assay and calibration of sealed sources and radiopharmaceuticals, as well as quarterly source inventory. Radiation safety measurements to satisfy federal and state regulations.

- Experience in linac-based stereotactic radiosurgery and total body irradiation.

- 3D conformal therapy treatment planning. CT-based virtual simulation.

- 2D treatment planning and manual calculations for external beam radiotherapy and intracavitary and interstitial brachytherapy, including COMS eye plaque.

- Commissioning an upgrade of a linear accelerator related to electron beams and wedges after installation of a multileaf collimator.

- Acceptance testing and commissioning a Varian Clinac 2300 accelerator.

- Experience with a variety of dosimetry instruments (Farmer chambers, parallel-plate chambers, electrometers, TLD systems, film and computer controlled scanning water phantom systems).

- Dosimetry analysis and QA of multileaf collimator and dynamic wedge techniques.

MEDICAL EQUIPMENT EXPERIENCE

- **Linear Accelerators:** Varian Clinac 2300C/D, Clinac 2100C, Clinac 6/100 and Clinac 4

- **Treatment Planning Systems:** Varian Eclipse, CMS Modulex RTP, CMS Focus 3D RTP and Nucletron NPS treatment planning system, AcQsim/VoxelQ CT-based simulation software (picker), VARiS Oncology information management system (Varian).

- **Brachytherapy Remote Afterloaders:** Nucletron Selectron - LDR and Micro - Selectron HDR remote afterloaders.

- **Simulators:** Varian Ximatron 5 and Ximatron CX.

- **CT Simulator:** Picker PQ-2000

- **Water Scanning Dosimetry System:** CMS Dynascan System.

- **Superficial Unit:** Philips Endocavity RT-50.

Lexell Gamma Knife

TEACHING AND SUPERVISORY EXPERIENCE

Lectures to graduate and undergraduate students in the Health Physics and Comprehensive Medical Imaging Programs at UNLV. Courses taught include the following:

CMI 330 – Introduction to Magnetic Resonance Imaging
CMI 331 – Principles of Magnetic Resonance Imaging
CMI 332 – Magnetic Resonance Imaging Pathology
CMI 350 – Ultrasound Physics and Instrumentation
CMI 360 – Principles of Computed Tomography
CMI 361 – Computed Tomography Pathology
CMI 490 – Comprehensive Medical Imaging Clinical Education
CMI 485 – Imaging Case Reviews
HPS 102 – Radiation Science
HPS 495 – Integrated Study in Health Physics
HPS 496 – Advanced Health Physics
HPS 620 – Radiation Biology
HPS 720 – Radiation Dosimetry
HPS 730 – Advanced Radiation Biology
HPS 740 – Medical Imaging Physics
HPS 742 – Radiation Therapy Physics
HPS 742L- Radiation Therapy Physics Lab

I have been a guest lecturer in the following courses:

CMI 310 – Medical Imaging

- Lectures to residents and staff at Mallinckrodt Institute of Radiology (MIR) on topics including: AAPM TG-21, TG-40, TG-36, Interface Dosimetry, Treatment Planning: Hodgkin's Disease, Treatment Planning: Breast, Treatment Planning: Thorax, and Stereotactic Radiosurgery.

- Teaching treatment planning labs to therapy school students at MIR.

- Supervising undergraduates, graduates and physicians at the Biomedical Optics Lab at the Beckman Laser Institute and Medical Clinic.

- McMaster University Teaching Assistant in undergraduate physics and engineering - Laboratory Techniques.

- McMaster University Teaching Assistant in graduate physics - Computational Techniques

in Medical Physics.

STUDENTS SUPERVISED

Kamran Ul Haq, "Characterization of a p-type silicon semiconductor diode for use in *in vivo* dosimetry," M.S. Thesis, UNLV, May 2000.

Scott A. Friesen, "Protoporphyrin IX distribution in rat brain following the administration of 5-aminolevulinic acid and its hexylester," M.S. Thesis, UNLV, July 2003.

Robin M. Rodenbush, "Investigation of different light delivery schemes in photodynamic therapy of human glioma spheroids," M.S. Thesis, UNLV, 2003.

Sung-Yop Kim, "Efficacy of a novel contrast agent for intraoperative magnetic resonance imaging of the brain," M.S. Thesis, UNLV, 2007

Khishigzaya Kharkhuu, "Effects of photodynamic therapy and photochemical internalization in a rat glioma cell line," M.S. Thesis, UNLV, 2007

David Chighvinadze, "Evaluation of photodynamic therapy-induced edema in the rat brain using magnetic resonance imaging," M.S. Thesis, UNLV, 2008.

Michelle Zhang, "Selective disruption of the blood-brain barrier by photochemical internalization," M.S. Thesis, UNLV, 2008.

Joe Blickenstaff, "The use of photochemical internalization to enhance the cytotoxic effects of bleomycin in F98 rat glioma cells," M.S. Thesis, UNLV, 2009.

Kamran Ul Haq, Ph.D. Dissertation "Brain CT perfusion characterized by vascular territories tissue types and 3D structural volumes."

Amani Makkouk, M.S. "Macrophages loaded with gold nanoshells for thermal ablation of glioma: an in vitro model," M.S. Thesis, UNLV, 2010.

Christina Fennimore, M.S. "Effects of hyperthermia on photochemical internalization-mediated delivery of bleomycin," M.S. Thesis, UNLV, 2012

Suyog Chhetri M.S. "Efficacy of gold silica nanoshells and gold nanorods for photothermal therapy of human glioma spheroids," M.S. Thesis, UNLV, 2013.

Aaron Anderson M.S. "$AlPcS_{2a}$-mediated photochemical internalization of bleomycin and concurrent hyperthermia of multicellular tumor spheroids," M.S. Thesis, UNLV, 2013.

Gregory Colarch M.S. (in progress)

En-Chung Shih M.S. (in progress)

Timothy Thatcher (in progress)

RESEARCH EXPERIENCE AND SKILLS

- Extensive experience in optical spectroscopy: Experiments in picosecond laser spectroscopy performed at the Harrison Spectroscopy Laboratory, MIT (1988-1990) and at the Ontario Laser and Lightwave Research Centre (1990-1992).

- Extensive experience in time-resolved and frequency-domain spectroscopy and imaging of biological tissues using lasers.

- Familiarity with a variety of optical detectors: photodiodes, avalanche photodiodes, PMT's, microchannel plate PMT's, integrating spheres, CCD's, and streak cameras.

- Familiarity with techniques used to dectect light pulses: Lock-in Detection, Time Correlated Single Photon Counting, and Frequency Domain Spectroscopy.

- Familiarity with a variety of light sources: Arc lamps, diode lasers, gas lasers, dye lasers and solid state lasers.

- Familiar with the principles underlying the generation of short and ultrashort laser pulses: Mode locking, Q - switching and cavity dumping.

- Extensive experience with PDT laser systems: Argon pumped dye lasers, frequency doubled Nd:YAG lasers, and high power diode array lasers.

- Extensive experience with optical fibers in biomedical applications (single mode, multi mode, bundles, cylindrical, and spherical). Familiar with cleaving and polishing fibers.

  Experience with two-photon fluorescence microscopy and confocal microscopy

- Extensive experience in PDT dosimetry in animals and human tissue.

- Experience in mathematical modeling. Broad experience in numerical computation: Monte Carlo calculations, FFT, convolution, differential equations, and nonlinear least square techniques.

- Knowledge of diagnostic imaging techniques (MRI, CT, PET and SPECT), as well as basics of image reconstruction algorithms.

- Familiar with basic electronics.

- Proficiency in BASIC and FORTRAN programming on various computer platforms (VMS, PC/DOS and some UNIX).

- Familiar with the basics of cell culturing.
- Experience with small animal surgery.

PRESENTATIONS

S.J. Madsen, M.S. Patterson and B.C. Wilson, Ontario Cancer Treatment and Research Foundation Physics Research Meeting, Lake Couchiching, September 1987.

S.J. Madsen, M.S. Patterson and B.C. Wilson, First Annual Radiology Research Day, Hamilton, October 1988.

S.J. Madsen, M.S. Patterson and B.C. Wilson, Second Annual Radiology Research Day, Hamilton, October 1989.

S.J. Madsen, M.S. Patterson and B.C. Wilson, Seventh McMaster University Symposium on Nuclear Science and Engineering, Hamilton, October 1990.

S.J. Madsen, M.S. Patterson, B.C. Wilson, Y.D. Park, J.D. Moulton, S.L. Jacques and Y. Hefetz, SPIE International Society for Optical Engineering O-E LASE '91, Los Angeles, January 1991.

S.J. Madsen, S.M. Jaywant, M.S. Patterson, B.C.Wilson and A. Othonos, Fourth Annual Radiology Research Day, Hamilton, November 1991.

S.J. Madsen, Seminar, Massachusetts Institute of Technology, February 1992.

S.J. Madsen, Seminar, Beckman Laser Institute and Medical Clinic, University of California - Irvine, September 1992.

S.J. Madsen, Seminar, Department of Radiology, University of California - Irvine, May 1993.

S.J. Madsen, P. Wyss, B.J. Tromberg, L.O. Svaasand, R.C. Haskell and Y. Tadir, Annual Meeting of the Optical Society of America, Toronto, October 1993.

S.J. Madsen, B.J. Tromberg, P. Wyss, L.O. Svaasand, R.C. Haskell and Y. Tadir, Advances in optical imaging and photon migration, Optical Society of America, Topical Meeting, Orlando, Florida, March 1994.

S.J. Madsen, L.O. Svaasand, M.K. Fehr, Y. Tadir, P. Ngo and B.J. Tromberg, BiOS Europe '94, International Symposium on Biomedical Optics, Lille, France, September, 1994.

S.J. Madsen, E.R. Anderson, R.C. Haskell and B.J. Tromberg, BiOS '95, International Symposium on Biomedical Optics. San Jose, USA, February, 1995.

Steen J. Madsen, Chung-Ho Sun, Eugene Chu, Henry Hirschberg and Bruce J. Tromberg, , BiOS '99, International Symposium on Biomedical Optics. San Jose, USA, February, 1999.

Steen J. Madsen. Lars O. Svaasand, Henry Hirschberg, Yona Tadir and Bruce J. Tromberg, BiOS '99, International Symposium on Biomedical Optics. San Jose, USA, February, 1999.

Steen J. Madsen, Eugene A. Chu and Brian J. F. Wong, "Optical property measurements in mammalian cartilage," BiOS '00, International Symposium on Biomedical Optics, San Jose, USA, January, 2000.

Steen J. Madsen, Chung-Ho Sun, Bruce J. Tromberg and Henry Hirschberg, "Fluence rate effects in human glioma spheroids: implications for photodynamic therapy of brain tumors," BiOS'01, International Symposium on Biomedical Optics, San Jose, USA, January, 2001.

Steen J. Madsen, Lars O. Svaasand, Bruce J. Tromberg and Henry Hirschberg, "Characterization of the light distribution from an intracranial balloon applicator for photodynamic therapy," BiOS'01, International Symposium on Biomedical Optics, San Jose, USA, January, 2001.

Reshmi Basu, Brian J.F. Wong and **Steen J. Madsen,** "Wavelength dependent scattering of light during laser irradiation," BiOS'01, International Symposium on Biomedical Optics, San Jose, USA, January, 2001.

Steen J. Madsen, "Treatment of brain tumors with photodynamic therapy," Nevada Biomedical Research and Education Conference, Las Vegas, USA, March, 2001.

Henry Hirschberg, **Steen J. Madsen,** Chung-Ho Sun and Bruce J. Tromberg, "Experimental basis and development of a novel intracranial indwelling balloon light applicator: implications for photodynamic therapy in the brain," IPA 8th World Congress of Photodynamic Medicine, Vancouver, Canada, June, 2001.

Steen J. Madsen (invited), "Optimizing light delivery for photodynamic therapy of brain tumors," Canadian Association of Physicists Congress, Victoria, Canada, June, 2001.

Rogelio Sanchez, Chung-Ho Sun, and **Steen J. Madsen**, "Effects of Photodynamic Therapy and gamma radiation on human glioma spheroids," Society for the advancement of Chicanos and Native Americans in Science, Phoenix, AZ, Sept. 27-30, 2001.

Steen J. Madsen, Chung-Ho Sun, Bruce J. Tromberg and Henry Hirschberg **(invited)**, "Photodynamic therapy of human glioma spheroids: a comparative study of the

effectiveness of 5-aminolevulinic acid and its esters," BiOS'02, International Symposium on Biomedical Optics, San Jose, USA, January, 2002.

Robin Rodenbush, Chung-Ho Sun, Bruce J. Tromberg, Henry Hirschberg and **Steen J. Madsen**, "Effects of low-fluence rate PDT on glioma spheroids," BiOS'02, International Symposium on Biomedical Optics, San Jose, USA, January, 2002.

Reshmi Basu, Sergio Diaz-Valdes, Brian J.F. Wong and **Steen J. Madsen**, "Temperature dependent optical properties of porcine septal cartilage," BiOS'02, International Symposium on Biomedical Optics, San Jose, USA, January, 2002.

Robin Rodenbush and **Steen J. Madsen**, "Effects of low fluence rate PDT on human glioma spheroids," American Radiation Safety Conference and Exposition, Tampa Bay, FL, June 17, 2002.

Scott A. Friesen, Geir-Olav Hjortland, Henry Hirschberg, Olav Engebraaten, Quan Peng and **Steen J. Madsen**, "Evaluation of novel photosensitizers in laser treatments of brain cancer," American Radiation Safety Conference and Exposition, Tampa Bay, FL, June 17, 2002.

Steen J. Madsen, Chung-Ho Sun, Bruce J. Tromberg and Henry Hirschberg, "Effects of combined photodynamic therapy and ionizing radiation on human glioma spheroids," Gordon Research Conference, Lasers in Medicine and Biology, Meriden, New Hampshire, July 14-19, 2002.

Henry Hirschberg, **Steen J. Madsen** and Bruce J. Tromberg, "Effects of combined PDT and ionizing radiation or hyperthermia on human glioma spheroids," American Society of Photobiology, Quebec City, Canada, July 15, 2002.

Steen J. Madsen, Chung-Ho Sun, Bruce J. Tromberg and Henry Hirschberg, "Development of an *in vivo* model for the study of photodynamic therapy and anti-angiogenic treatments," BiOS'03, International Symposium on Biomedical Optics, San Jose, USA, January, 2003.

Steen J. Madsen (invited), Lasers in Medicine," Association of Information Technology Professionals, Las Vegas, September, 2003.

Steen J. Madsen, Scott A. Friesen, Geir-Olav Hjortland, Olav Engebraaten, Qian Peng and Henry Hirschberg, "Protoporphyrin IX distribution in rat brain following administration of 5-aminolevulinic acid or its hexylester," BiOS'04, International Symposium on Biomedical Optics, San Jose, USA, January, 2004.

Even Angell-Petersen, Dag R. Sorensen, **Steen J. Madsen** and Henry Hirschberg, "Interstitial light and drug applicator for repetitive PDT in a rat brain tumor model," BiOS'04, International Symposium on Biomedical Optics, San Jose, USA, January, 2004.

Henry Hirschberg, Even Angell-Petersen, Qian Peng, **Steen J. Madsen**, Mouldy Sioud and Dag R. Sorensen, "Repetitive 5-aminolevulinic acid mediated photodynamic therapy of rat glioma," BiOS'04, International Symposium on Biomedical Optics, San Jose, USA, January, 2004.

Steen J. Madsen, Dag Sorensen, Even Angell-Petersen and Henry Hirschberg, "Low fluence rate 5-aminolevulinic acid mediated photodynamic therapy in a rat glioma model," Sixth Biennial Satellite Symposium, AANS/CNS Section on Tumors, San Francisco, USA, October, 2004.

Steen J. Madsen, Chung-Ho Sun, Bruce J. Tromberg, Josephine Ni and Henry Hirschberg, "Addition of ionizing radiation or hyperthermia enhances PDT efficacy in glioma spheroids," BiOS'05, International Symposium on Biomedical Optics, San Jose, USA, January, 2005.

Nzola DeMagalhaes, Chung-Ho Sun, **Steen J. Madsen**, Henry Hirschberg and Bruce J. Tromberg, "Development of a brain tumor model for investigating the effects of photodynamic and anti-angiogenic therapies," BiOS'05, International Symposium on Biomedical Optics, San Jose, USA, January, 2005.

Henry Hirschberg, Even Angell-Petersen, Qian Peng, Chung-Ho Sun, Dag Sorensen, Stephen W. Carper and **Steen J. Madsen**, "ALA-mediated photodynamic therapy in a BD-IX rat brain tumor model," BiOS'05, International Symposium on Biomedical Optics, San Jose, USA, January, 2005.

Sarah A. Ziegler, **Steen J. Madsen** and Stephen W. Carper, "Hsp27 protects against ALA mediated PDT induced cytotoxicity in human breast cancer cells," 2005 American Society for Biochemistry and Molecular Biology Annual Meeting, San Diego, USA, April 2005.

Steen J. Madsen, Chung-Ho Sun, Bruce Tromberg and Henry Hirschberg, "In vitro studies of the effects of combining ionizing radiation or hyperthermia with ALA-PDT," 10th World Congress of the International Photodynamic Association, Munich, Germany, June 22-25, 2005.

Steen J. Madsen, Even Angell Petersen, Signe Spetalen, Dag Sorensen and Henry Hirschberg, "Low fluence rate 5-aminolevulinic acid-mediated photodynamic therapy of rat glioma," 10th World Congress of the International Photodynamic Association, Munich, Germany, June 22-25, 2005.

Even Angell-Petersen, **Steen J. Madsen**, Dag Sorensen and Henry Hirschberg, "In vivo measurement and modeling of light and temperature distributions during interstitial light delivery in a rat brain tumor model," 10th World Congress of the International Photodynamic Association, Munich, Germany, June 22-25, 2005.

Henry Hirschberg, Chung-Ho Sun, Tatiana Krasieva and **Steen J. Madsen**, "Reduction of the invasiveness of human glioma cells by ALA mediated photodynamic therapy," LAMMP Seminar, University of California, Irvine, November 2005.

Henry Hirschberg, Even Angell-Petersen, Signe Spetalen, Stephen W. Carper, Per Hole, Tom Tillung and **Steen J. Madsen**, "Minimally invasive photodynamic therapy (PDT) ablation of experimental rat glioma," LAMMP Seminar, University of California, Irvine, November 2005.

N DeMagalhaes, L-H L Liaw, L Li, A Liogys, **S Madsen**, H Hirschberg and B Tromberg, "Investigating the effects of combined photodynamic and anti-angiogenic therapies using a three-dimensional in vivo brain tumor system," LAMMP Seminar, University of California, Irvine, November 2005.

Henry Hirschberg, **Steen J. Madsen**, Genevieve N. Wu, "Contrast agents for intraoperative iMRI," International Brain Mapping and Intraoperative Surgical Planning Society 2005 Symposium, Pasadena, CA, November 2005.

Henry Hirschberg, Chung-Ho Sun, **Steen J. Madsen**, "Reduction of the invasiveness of human glioma cells by ALA-mediated photodynamic therapy," BiOS'06, International Symposium on Biomedical Optics, San Jose, USA, January, 2006.

Steen J. Madsen, Even Angell-Petersen, Signe Spetalen, Stephen W. Carper, Sarah A. Ziegler, Henry Hirschberg, "ALA-PDT of glioma micro-clusters in BD-IX rat brain," BiOS'06, International Symposium on Biomedical Optics, San Jose, USA, January, 2006.

Nzola DeMagalhaes, L.L. Liaw, Angela Liogys, **Steen J. Madsen**, Henry Hirschberg, Bruce J. Tromberg, "Investigating the effects of combined photodynamic and anti-angiogenic therapies using a three-dimensional in vivo brain tumor system," BiOS'06, International Symposium on Biomedical Optics, San Jose, USA, January, 2006.

Steen J. Madsen, Even Angell-Petersen, Qian Peng, Stephen W. Carper, Sarah A. Ziegler, Olav Engebraaten and Henry Hirschberg (invited), "ALA-PDT in experimental glioma models," Fifth International Workshop on Photodynamic Therapy and Photodetection with Porphyrin Precursors, Buenos Aires, Argentina, June 22 – 24, 2006.

Henry Hirschberg, Chung-Ho Sun and **Steen J. Madsen** (invited), "Effects of ALA-mediated photodynamic therapy on the invasiveness of human glioma cells," Fifth International Workshop on Photodynamic Therapy and Photodetection with Porphyrin Precursors, Buenos Aires, Argentina, June 22 – 24, 2006.

Sarah A. Ziegler, Becky M. Cox, Cherisse R. Loucks, **Steen J. Madsen**, Stephen W. Carper, "ALA and Photofrin mediated PDT induces apoptosis and necrosis in human breast cancer cells," American Association for Cancer Research, Washington, DC, April 2006.

Henry Hirschberg, Marlon S. Mathews, Even Angell-Petersen, Signe Spetalen and **Steen J. Madsen**, "Increased brain edema following 5-aminolevulinic acid administration mediated photodynamic therapy in normal and tumor-bearing rats," BiOS'07, International Symposium on Biomedical Optics, San Jose, USA, January, 2007.

Steen J. Madsen, Khishigzaya Kharkhuu, Kristian Berg, and Henry Hirschberg, "Photochemical internalization for the treatment of malignant gliomas," BiOS'07, International Symposium on Biomedical Optics, San Jose, USA, January, 2007.

Marlon S. Mathews, Chung-Ho Sun, **Steen J. Madsen** and Henry Hirschberg, "Comparing the effects of repetitive and chronic ALA-mediated PDT on human glioma spheroids," BiOS'07, International Symposium on Biomedical Optics, San Jose, USA, January, 2007.

Sarah A. Ziegler, Casey Hall, Cherisse Loucks, **Steen J. Madsen** and Stephen W. Carper, "Comparison of ALA and Photofrin in two rat glioma models," BiOS'07, International Symposium on Biomedical Optics, San Jose, USA, January, 2007.

Steen J. Madsen (invited), "Photodynamic therapy of malignant gliomas," Touro University, Henderson, NV, USA, February, 2007.

Steen J. Madsen (invited), "Photodynamic therapy of malignant gliomas," Department of Biomedical Engineering, Texas A&M University, College Station TX , USA, April, 2007.

Steen J. Madsen (invited), "Opportunities in Medical and Health Physics," Biomedical Engineering Society, Texas A&M University, College Station TX, USA, April, 2007.

Khishigzaya Kharkhuu, Scott Paulissen, Henry Hirschberg and **Steen J. Madsen**, "Photochemical internalization enhanced delivery of bleomycin in rat glioma cells," Health Physics Society Annual Meeting, Portland, Oregon, July, 2007.

David Chighvinadze, Henry Hirschberg, Phillip W. Patton and **Steen J. Madsen**, "Evaluation of photodynamic therapy-induced edema in the rat brain using magnetic resonance imaging," Health Physics Society Annual Meeting, Portland, Oregon, July, 2007.

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Catherine Christie, **Steen J. Madsen**, Qian Peng and Henry Hirschberg, "Macrophages as nanoparticle delivery vectors for photothermal therapy of brain tumors." Therapeutic Delivery (accepted).

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REVIEW PANELS

National Institutes of Health:

Member of the National Cancer Institute Initial Review Group.
"Photodynamic Therapy for Intraperitoneal Neoplastic Diseases," (NCI-D GRB-4 (P1)) Jan 18-20, 2000, University of Pennsylvania.

Member of the National Cancer Institute Initial Review Group.
"Photodynamic Therapy For Intraperitoneal Neoplastic Diseases," (NCI-D GRB-4 (P1)) Feb. 16, 2001.

Consultant, Health Radiation Study Section, June 17, 2002.
Member, Radiation Biology and Medical Physics (ZRG1 SSS-1 (11)), March 10, June 20, 2003

Member, Radiation Physics (ZRG1 RTB 11B), Nov. 6, 2003.
Member, Novel Radiation Therapeutics (ZRG1 ONC-N 10B), March 12, 2004.
Member, Special Emphasis – Proton based radiotherapy (ZRG1 ONC-M (05)), April 29, 2004
Member, Radiation Therapeutics and Biology Special Emphasis Panel (ZRG1 ONC-M 11B), July 12, 2004
Member, Radiation Therapeutics and Biology Special Emphasis Panel (ZRG1 ONC-R 11B), November 8, 2004
Chair, Radiotherapy and Radiation Biology Special Emphasis Panel (ZRG1 ONC-R (11)) March 14, 2005
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), July 11, 2005
Chair, Radiotherapy and Radiation Biology (ZRG1 ONC-R 11 B), November 14, 2005.
Member, Photodynamic Therapy in Cancer (ZRG1 ONC-J 02 M), February, 28, 2006.
Chair, Radiotherapy and Radiation Biology (ZRG1 ONC-R 11), March 20, 2006.
Chair, Radiotherapy and Radiation Biology (ZRG1 ONC-R 11), July 20, 2006.
Chair, Radiotherapy and Radiation Biology Special Emphasis Panel (ZRG1 ONC-R 11 S) October 30-31, 2006
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), March 05-06, 2007
Chair, Radiation Therapy and Biology (ZRG1 ONC-P (11)), July 12-13, 2007
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11 B)), Oct. 23-24, 2007
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), Feb. 21-22, 2008
Member of the National Cancer Institute PO1 Special Emphasis Panel.
"Discovery and Development," (ZCA1 GRB-P O1 P) June 4-5, 2008, Gaithersburg, MD.
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), June 23, 2008
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), Oct. 28-29, 2008
Chair, Radiation Therapy and Biology (ZRG1 ONC-R (11)), Feb. 24-25, 2009
Member, Radiation Therapy and Biology (ZRG1 ONC-R (11)), June 29, 2009
Member, Radiation Therapy and Biology (ZRG1 OTC-R (11B)), Oct. 27-28, 2009

U.S. Civilian Research and Development Foundation:
Grant reviewer: "Laser physics and engineering of cartilaginous tissue, October 2004.
Grant reviewer: "Equipment for laser septochondrocorrection," September 2005.

Natural Sciences and Engineering Research Council of Canada:
Grant reviewer: "Multi-modality optical spectroscopy technology for non-invasive real-time brain tumor margin detection." December 2006.

Grant reviewer: "Optical coherence tomographic imaging for monitoring radiotherapy complications in the rectum." January 2009.

Grant reviewer: "Optical guidance for safe and effective brain tumor biopsy." December 2013.

Canadian Institute for Photonic Innovations:
Grant reviewer: "Two-photon excitation photodynamic therapy (TPE-PDT)," March, 2008

French National Cancer Institute:
Grant reviewer: "Nanoparticle-based x-ray-induced photodynamic therapy in glioblastoma multiforme," April, 2010.

National Medical Research Council of Singapore:
Grant reviewer: "Diffuse optical spectroscopy and imaging for non-invasive real-time monitoring of tumor response to photodynamic therapy to predict treatment outcome and optimize treatment protocols." January 2013.

CONFERENCE CHAIR

Optical Techniques for Neurosurgery and Brain Imaging, BiOS'04, International Symposium on Biomedical Optics, San Jose, USA, January, 2004.

Optical Techniques for Neurosurgery and Brain Imaging, BiOS'05, International Symposium on Biomedical Optics, San Jose, USA, January, 2005.

Optical Techniques for Neurosurgery and Brain Imaging, BiOS'06, International Symposium on Biomedical Optics, San Jose, USA, January, 2006.

Optical Techniques for Neurosurgery and Brain Imaging, BiOS'07, International Symposium on Biomedical Optics, San Jose, USA, January, 2007.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'08, International Symposium on Biomedical Optics, San Jose, USA, January, 2008.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'09, International Symposium on Biomedical Optics, San Jose, USA, January, 2009.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'10, International Symposium on Biomedical Optics, San Francisco, USA, January, 2010.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'11, International Symposium on Biomedical Optics, San Francisco, USA, January, 2011.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'12, International Symposium on Biomedical Optics, San Francisco, USA, January, 2012.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'13, International Symposium on Biomedical Optics, San Francisco, USA, February, 2013.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'14, International Symposium on Biomedical Optics, San Francisco, USA, February, 2014.

Optical Techniques for Neurosurgery, Brain Imaging and Neurobiology, BiOS'15, International Symposium on Biomedical Optics, San Francisco, USA, February, 2015.

SESSION CHAIR

International Photodynamic Association, Seattle, USA, June, 2009

Novel Optical Instrumentation for Biomedical Applications, European Conferences on Biomedical Optics, Munich, Germany, June, 2009.

CONSULTANT

School of Health Related Professions, University of Alabama, Birmingham, April 13-15, 2005.

Gamma Knife Center, Sunrise Hospital, Las Vegas, Nevada: Oct. 2007 – Mar. 2012.

JOURNAL REVIEWS AND EDITORIAL BOARDS

Co-editor for the special issue on "Lasers and Optical Technologies in Head and Neck Surgery-Otolaryngology" for the journal: *Frontiers in Bioscience.*

Associate Editor, Journal of Environmental Pathology, Toxicology and Oncology (Nov. 2006 – present).

Guest Editor, Journal of Biomedical Optics (Oct. 2006).

Reviewer for the following journals:

Acta Biochimica et Biophysica Sinica
Applied Optics
Biochemical Sciences
Biological Research for Nursing
Biomedical Optics Express
Bone Marrow Transplantation
Breast Cancer Research and Treatment
British Journal of Cancer
Cancer Letters
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Chemical Reviews
Clinical Cancer Research
Current Pharmaceutical Biotechnology
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Eye and Brain
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IEEE Journal of Quantum Electronics
IEEE Transactions on Biomedical Engineering
International Journal of Cancer
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International Journal of Nanomedicine
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Journal of Biomedical Optics
Journal of Environmental Pathology, Toxicology and Oncology
Journal of Experimental and Clinical Cancer Research
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Journal of the Optical Society of America: A
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Lasers in Medical Science
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Medical Physics
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Optics Express
Optics Letters
Nature Photonics
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Neurological Research
Photochemistry and Photobiology
Photochemistry and Photobiological Sciences
Photonics and Lasers in Medicine
Physics in Medicine and Biology
PLoS One
Technology in Cancer Research and Treatment
The Lancet

PROFESSIONEL SOCIETIES

American Association for the Advancement of Science
American Association of Physicists in Medicine
American Society for Laser Medicine and Surgery (Fellow)
The Association of Nevada Neuroscience, Cognition, & Imaging Researchers
Society of Photo-Optical Instrumentation Engineers

BOARD CERTIFICATION

Passed ABMP/ABR Parts I and II