

COLLEGE OF MEDICINE CURRICULUM VITAE (current year highlighted)

Douglas R. Spitz, PhD
Feb 15, 2022

I. EDUCATIONAL AND PROFESSIONAL HISTORY

A. List of institutions attended (least to most recent)

Grinnell College	1974-1978	Biology/Sociology	B.A. 1978
University of Iowa	1979-1984	Radiation Biology Minor-Biochemistry	Ph.D. 1984

B. Professional and academic positions held (least to most recent)

Research Assistant/Graduate Student Radiation Research Laboratory, University of Iowa Iowa City, Iowa	9/1979 – 1981
Research Fellow (NIH Training Grant) Radiation Research Laboratory, University of Iowa Iowa City, Iowa	6/1981 – 1984
Postdoctoral Scholar (NIH Training Grant) Radiation Oncology Research Laboratory, University of California San Francisco, California	10/1984 – 1987
Research Associate Department of Pediatrics University of Virginia, Children's Medical Center Charlottesville, Virginia	10/1987 – 1989
Research Assistant Professor Department of Pediatrics, University of Virginia, Children's Medical Center Charlottesville, Virginia	7/1989 – 1992
Assistant Professor Mallinckrodt Institute of Radiology, Radiation Oncology Center, Section of Cancer Biology, Washington University School of Medicine St. Louis, Missouri	1/1993 - 2/2000
Associate Professor (with tenure) Free Radical and Radiation Biology Program, Dept. of Radiation Oncology University of Iowa, Iowa City, IA	2/2000-6/2006
Professor Free Radical and Radiation Biology Program, Dept. of Radiation Oncology University of Iowa, Iowa City, IA	7/2006-present
Director Biosciences Program, University of Iowa, Iowa City, IA	9/2011-2014

Director 1/2008-present
Free Radical and Radiation Biology Graduate Program, Dept. of Radiation
Oncology
University of Iowa, Iowa City, IA

Director 4/2008-present
Free Radical Metabolism and Imaging Program, Holden Comprehensive
Cancer
University of Iowa, Iowa City, IA

Director 4/2008-present
Radiation and Free Radical Research Core, Holden Comprehensive Center
and College of Medicine
University of Iowa, Iowa City, IA

C. Honors, Awards, Recognitions, Outstanding Achievements (least to most recent)

- Young Investigator Travel Award—Radiation Research Society (1987)
- Young Investigator Award—International Society for Free Radical Research/The Oxygen Society (1990)
- Titus C. Evans Memorial Lecturer, University of Iowa (1995)
- Editorial Board - Toxicology Letters (1995-2000)
- Editorial Board – Free Radical Biology and Medicine (2000-present)
- Editorial Board – Cancer Letters (2009-2014)
- Editorial Board – Cancer Research (2013-present)
- Editorial Board – Radiation Research (2013-present)
- Editorial Board – Antioxidants (2019-present)
- Elected to Wash. U. Rad. Onc. Center Steering Committee (1995-1996)
- Appointed Full Member - Washington University Cancer Center (1996-2000)
- Appointed Full Member - University of Iowa Cancer Center (2000-present)
- Member, Program Committee, Radiation Research Society (2001-2002) (2012-2015)
- Distinguished Scientist Lecturer, University of South Alabama (2001)
- Elected Counselor for the North American Hyperthermia Society (2001-2004)
- Elected Counselor for the Society for Free Radical Biology and Medicine (2002-2006)
- Appointed sitting member of the Radiation Therapeutics and Biology (RTB) Study Section NCI/NIH (2006-2010)
- Elected Counselor for the Radiation Research Society (2011-2014)
- Elected Fellow of the Society for Redox Biology and Medicine (2019)
- Appointed sitting member of the Tumor Cell Biology (TCB) Study Section NCI/NIH (2015-2019)
- Ad Hoc Reviewer NCI R35 Outstanding Investigator Award study section (2015, 2017, 2019)
- Ad Hoc Reviewer NCI K22 (2020-2021; 5 cycles)
- Grinnell College Alumni Award (2018)
- Elected Fellow of the Society for Redox Biology and Medicine (2019)

II. TEACHING

A. Teaching assignments (least to most recent)

Grinnell College, Biology Department

Invertebrate Zoology - Teaching Assistant (1975 and 1976)
Comparative Anatomy - Teaching Assistant (1978)

University of Iowa, Radiology Department, Radiation Research Laboratory

Intro to Radiation Biology (77:103)—Teaching Assistant (1981)
Radioisotopes in Biological Research (77:224)—Teaching Assistant (1981)
Radiation Health Physics (77:211)—Teaching Assistant (1982)
Cellular Radiobiology (77:223)—Teaching Assistant (1982)
Mammalian Radiobiology (77:220)—Teaching Assistant (1983)

Washington University, School of Medicine, Graduate College, Undergraduate School

Cancer Biology Course for Radiation Oncology Residents
(4 lectures/yr), 1993-1999
Cancer Biology Course for Nuclear Medicine Residents
(1 lecture/year), 1994-1999
Cancer Biology Course for Radiation Therapy Technologists (4 lectures/year),
1994, 1996, 1999
Cancer Biology Course for Medical School Summer Internship in Rad. Onc.
(1 lecture/year), 1998, 1999
Cell Biology of the Stress Response (7 lectures/year), 1997, 1998, 1999
Biology 500 Independent Research (2 students/semester ea 1998, 1999)
Biology 200 Independent Research (1 student/semester, 1999)

University of Missouri-Rolla Graduate College

Free Radicals in Biochemistry (Chemistry 401) (1-3-hour lecture, 1998)

The University of Iowa, Free Radical and Radiation Biology Program

Radiation Biology (FRRB:5000) (4 lectures, F2000), (11 lectures, F2001),
(Course director, 12 lectures/yr, F2002-F2006), (12 lectures/year, 2007-
2009), (9-lectures 2010, 2012) (8 lectures 2013, 2015, 2017) (4 lectures
2019, 2021).

Molecular and Cellular Biology of Cancer (FRRB:7001) (1 two-hour lecture
2017-2022)

Redox Biology & Medicine (Free Radicals in Medicine and Biology)
(FRRB:7000) (3 lectures, S2001, S2003, S2005, S2007), (7 lectures,
S2009), (5 lectures S2011), (9 lectures, S2013) (9 lectures, F2014) (9
lectures F2016) (7 lectures Spring 2018 and Spring 2020, 2022)

Principles in Molecular and Cell Biology (156:201)
(Facilitator, F2001-F2006, 4-5 hrs/semester)

Topic in Free Radical Biology and Medicine (FRRB:6006; 8 sessions/semester)

Radiobiology for Radiation Therapy Technologists (Course Director, 2001-2009, 4 lectures/yr)
 Current Topics in Radiation and Cancer Biology (Course director, FRRB:6008, 2000-2021, 8 sessions/semester)
 Free Radical and Radiation Biology Seminar (FRRB:6000) 2000-2021, 16 sessions/semester
 Radiation Safety and Radiobiology, (FRRB:3130) (Instructor, 1 lecture, 2011, 2012, 2013)
 Critical Thinking and Communications, (156:265:001 &2) Instructor, 16 weeks, S2013, F2013
 Introduction to Cancer Biology for the Lincoln University/Iowa CURE Summer research program to promote diversity 1 lecture/year 2007-2021
 Futures Program at Iowa 1 lecture on Free Radical Cancer Biology 2020
 BMED:7270 Scholarly Integrity/Responsible Conduct of Research I – Instructor, 4 sessions/year 2017, 2019, 2020

Graduate students supervised (name, degree objective, outcome, *T32, Spitz Thesis Adviser Bolded 20 PhDs; 5 MS)

- 1) Lisa A. Ridnour (Ph.D. Thesis Committee Member – graduated 1995)
- 2) Roger Winters (Ph.D. Thesis Committee Chairman – graduated 1996)**
- 3) Rachel Neal (Ph.D. Thesis Committee Member – graduated 1999)
- 4) Deniz Yildiz (Ph.D. Thesis Committee Member – graduated 1999)
- 5) Iman Ahmad (Ph.D. Thesis Advisor – graduated 2003)**
- 6) Ling Li (M.S. Thesis Advisor – graduated 2002)**
- 7) *Kelly Andringa (Ph.D. Thesis Advisor – graduated 2005)**
- 8) Tongrong He (Ph.D. Thesis Committee Member – graduated 2002)
- 9) Eric Kelley (Ph.D. Thesis Committee Member – graduated 2003)
- 10) Hong Duan (Ph.D. Thesis Committee Member – graduated 2003)
- 11) Jun Luo (Ph.D. Co-Advisor – graduated 2004)**
- 12) Jo Morrison (Ph.D. Thesis Committee Member – graduated 2004)
- 13) Min Wang (Ph.D. Thesis Committee Member – graduated 2004)
- 14) Christine Wydert (Ph.D. Thesis Committee Member – graduated 2004)
- 15) Wenqing Sun (Ph.D. Thesis Committee Member – graduated 2004)
- 16) Chris Van de Wetering (Ph.D. Thesis Committee Member – graduated 2008)
- 17) Benjamin Slane (M.S. Thesis Advisor – graduated 2004)**
- 18) Gurminder Sidhu (M.S. Thesis Advisor – graduated 2005)**
- 19) Hualei Li (Ph.D. Thesis Committee Member – graduated 2006)
- 20) Lei Yu (Ph.D. Thesis Committee Member – graduated 2006)
- 21) *Kjerstin Owens (Ph.D. Thesis Advisor – graduated 2008)**
- 22) Jodie Haak (Ph.D. Thesis Committee Member – graduated 2008)
- 23) Ling Xiao (PhD Co-Thesis Advisor – graduated 2007)**
- 24) Disha Dayal (PhD Thesis Advisor – graduated 2008)**
- 25) *Tanja Hadzic (PhD Thesis Advisor – graduated 2008)**
- 26) Kate Pederson (MS Thesis Committee Member – graduated 2005)
- 27) Steve Hummel (MS Thesis Committee Member – graduated 2005)
- 28) Mike Hitchler (PhD Thesis Committee Member – graduated 2008)

- 29) Annie Liu (MS Thesis Advisor – graduated 2007)**
 30) James Jacobus (PhD Thesis Committee Member – graduated 2009)
31) Yueming Zhu (PhD Thesis Co-Advisor – graduated 2011)
 32) Leena Chaudhuri (PhD Thesis Committee member- graduated 2010)
33) *Peter Scarbrough (PhD Thesis Advisor – graduated 2011)
34) Kranti Mapuskar (PhD Thesis Advisor – graduated 2013)
35) Arya Sobhakumari (PhD Thesis Co-Advisor – graduated 2013)
36) Mitchell Coleman (PhD Thesis Advisor – graduated 2012)
37) Gaowei Mao (PhD Thesis Advisor – graduated 2013)
38) Chester Duda (MS Thesis Advisor – graduated 2012)
 39) Ted Wilson, (PhD Thesis Committee Member – graduated 2013)
 40) Maneesh Kumar, (PhD Thesis Committee Member – graduated 2012)
 41) Elise Fletcher, (MS Thesis Committee Member – graduated 2012)
 42) Jeffrey He, (PhD Thesis Committee Member – graduated 2014)
 43) Kyle Kloepping, (PhD Thesis Committee Member – graduated 2015)
 44) Jessica Reedy, (PhD Thesis Committee Member – graduated 2016)
45) *Joshua Schoenfeld, (MSTP PhD Thesis Co-Advisor – graduated 2018)
46) Shane Solst (PhD Thesis Advisor – graduated 2021)
 47) Sean Gu (MSTP PhD Thesis Committee member – graduated 2016)
48) Kelly Falls (MSTP, PhD Thesis Advisor – PhD graduated 2020)
 49) *Madelyn Espinosa-Cotton (PhD Thesis Committee Member – graduated 2018)
 50) Cameron Cushing (PhD Thesis Committee Member – Graduated 2020)
 51) Jyung Mean Son (PhD Thesis Committee Member – graduated 2017)
52) *Collin Heer (PhD Thesis Advisor – graduated 2021)
 53) Somya Kapoor (PhD Thesis Committee Member – graduated 2018)
 54) Jeffrey Stolwijk (PhD Thesis Committee Member – graduated 2020)
55) Casey Pulliam (PhD Thesis Advisor – Expected 2023)
56) Khaliunaa Bayanbold (PhD Thesis Advisor – Expected 2023)
57) Sei Sho (PhD Thesis Co-advisor Expected 2025)
58) Mekhla Singhanian (PhD Thesis Advisor expected 2025)
 59) Emily Steinbach (PhD Thesis Committee Co-Mentor – Expected 2023)
 60) *Michael Petronek (PhD Thesis Committee Member – Expected 2022)
 61) *Michelle Tamplin (PhD Thesis Committee Member – graduated 2021)
 62) Yusuf Ali (PhD Thesis Committee Member – Expected 2022)

Other contributions to institutional programs

"A Mechanistic Link Between Metabolism, Signal Transduction, and Gene Expression: Unifying Metabolic and Genetic Theories of Cancer", Holden Cancer Center Forum, University of Iowa, May 15, 2001.

"Follow the Electrons: an integrated approach to understanding the relationship between metabolism, signal transduction and gene expression in stress response biology" Exercise Science Program Seminar, University of Iowa, February 2004.

“Metabolic Oxidative Stress and Cancer” Department of Neurosurgery, Departmental Seminar, University of Iowa, March 2004.

“Metabolic Oxidative Stress and Cancer” Prostate Cancer Research Program Seminar, Holden Comprehensive Cancer Center, University of Iowa, May 2004.

”Metabolic Oxidative Stress and Cancer Therapy”, Holden Cancer Center Forum, University of Iowa, June 2005.

“2-Deoxyglucose in Head and Neck Cancer Therapy: Free Radical Research from Bench to Bedside”, Dedication of the Center of Excellence in Image Guided Radiation Therapy and ISTRO meeting, University of Iowa, June 2005.

“Metabolic Oxidative Stress and Cancer Biology” Molecular Physiology and Biophysics Seminar, University of Iowa, Aug 2006.

“2-Deoxyglucose Enhances the Cytotoxicity of Wild Type p53 in Prostate Carcinoma Cells via Metabolic Oxidative Stress” Prostate Cancer Research Program Seminar, Holden Comprehensive Cancer Center, University of Iowa, September 2006.

“Metabolic Oxidative Stress and Cancer Therapy: From the bench to the bedside”, Hematology-Oncology Fellowship Program Seminar, Holden Comprehensive Cancer Center, University of Iowa, October 2008.

“Metabolic Oxidative Stress and Cancer Therapy: From the bench to the bedside”, Internal Medicine Medical Student/Residents Seminar, University of Iowa, September 2009.

“Metabolic Oxidative Stress and Cancer Therapy”, Department of Obstetrics and Gynecology, Research Seminar, University of Iowa, October 2009.

“Metabolic Oxidative Stress and Cancer Therapy” Medical Oncology Fellowship Training Seminar Series, The University of Iowa, Internal Medicine Department, Fall 2008-2011.

”The Use of Ketogenic Diets in Cancer Therapy”, Holden Cancer Center Forum, University of Iowa, June 2011.

“Metabolic Oxidative Stress Cancer Biology and Therapy: the way of future translational research in the Free Radical Cancer Biology Program” HCCC Scientific Retreat, The University of Iowa, Levitt Center, June 2012.

"The Use of Dietary Manipulations in Head and neck Cancer Therapy", Head and Neck Cancer MOG meeting, Holden Cancer Center, University of Iowa, June 2012.

"Follow the Electrons: An Integrated Approach to Understanding Theories of Cancer Useful in Cancer Biology and Therapy" Prostate Cancer Research Group Seminar, University of Iowa, October 2012.

"Metabolic Oxidative Stress in Cancer Biology and Therapy" Department of Biology Seminar, Kollros Auditorium, University of Iowa, March 2013

"Metabolic Oxidative Stress in Cancer Biology and Therapy" Mitochondrial Interest Group Seminar, University of Iowa, April 2013

"Harnessing redox biology for improving cancer therapy outcomes while protecting normal tissue" Department of Pathology Grand Rounds Presentation, HP Smith Conference Room, University of Iowa, November 2017.

"Free Radicals in Cancer and Aging" Joint symposium of the Diabetes and Cancer Center, University of Iowa, 2019.

"SOD mimics enhance cancer therapy responses to SBRT via H₂O₂ production" Translational research meeting, Radiation Oncology, 2021.

"Redox Mechanisms of FLASH and SBRT radiation responses" HCCC grand rounds 2021, University of Iowa, 2021

"Recent updates to the Pharmacological Ascorbate Redox regulation of Immunology Projects" HCCC grand rounds October 2021, University of Iowa.

Mentor for Fellowship Training:

Shannon J. Sullivan, M.D. (Neonatology Fellow, 1988-1992)

Kyle E. Brown, M.D. (Gastroenterology Fellow, 1991-1992)

M. Whit Walker, M.D. (Neonatology Fellow, 1990-1992)

Frances J. Northington, M.D. (Neonatology Fellow, 1988-1992)

Lisa A. Ridnour, Ph.D. (Radiation Oncology Fellow, 1995-1999)

Nukhet Aykin-Burns, Ph.D. (Free Radical and Radiation Biology Fellow, 2003 - 2007)

Ann Simons, Ph.D. (Free Radical and Radiation Biology Fellow, 2005 - 2009)

Melissa Fath, Ph.D. (Free Radical and Radiation Biology Fellow, 2005 - 2008)

James Jacobus, PhD (Free Radical and Radiation Biology Fellow, 2009-2013)

Paul Akhenblit, PhD (Free Radical and Radiation Biology Fellow 2016-2018)

Somya Kapoor PhD (Free Radical and Radiation Biology Fellow 2020-2021)
Jeffrey Stolwijk PhD (Free Radical and Radiation Biology Fellow 2020-present)

Mentor for Research Residency Training:

Gurminder Sidhu, D.D.S. (Oral and Maxillofacial Radiology Resident and Master's Candidate, 2003-2005)
Dave Mattson, M.D. (Holman Pathway Research Resident in Radiation Oncology, 2004-2008)
Bryan Allen, MD PhD (Holman Pathway Research Resident in Radiation Oncology, 2009-2013)
Andrew Davis, MD (Otolaryngology T32 Research Fellow, 2015-2018)
Amanda L Ngouajio MD (Otolaryngology T32 Research Fellow, 2018-2020)

Howard Hughes Undergraduate Summer Research Program

Mark Gomez – 1997
Sajan Mahajan – 1999

Medical Student Summer Internship

Scott Mitchell – 1999
Benjamin Slane – 2005, 2006
Kaleigh Lindholm – 2010
Kendall K. Tasche – 2010
Kristin Brandt – 2011-2013
Tyler Ronnefeld - 2013
Travis Snyders – 2012, 2013
Joshua Schoenfeld - 2012
Kelly Falls – 2013
Travis Snyders - 2013
Daniel Ma – 2014
Sebastian Sciegienka – 2014, 2015
Kripa A. Guram – 2015
Ben Riffe – 2016
John Henrich - 2019

Minority Student Summer Research Program Mentor:

Tomala Trent—1989
Natasha Agee—1990-1992
Oliver Manigo—1994
Terrilyn Clardy—1995
Aba Coleman—1996
Lynette Head—2000
Elizabeth Okyne – 2007, 2009
Katherine Foster - 2008
Danielle McKnight – 2010
Nakita Brown – 2010
Shakeema Jones - 2012

Kojo Frimpong – 2014
Prisca Obidike - 2016
Nile Garner - 2017
Ciera Rouse - 2018
Merilyn Palmer - 2019

III. SCHOLARSHIP

A. Publications or creative works (least to most recent)

1. Spitz DR, Dewey WC and Li GC: Hydrogen peroxide or heat shock induces resistance to hydrogen peroxide in Chinese hamster fibroblasts. *J. Cell. Physiol.* 1987; 131:364-373. PMID: 3597544
2. Spitz DR, Li GC, McCormick ML, Sun Y and Oberley LW: Stable H₂O₂-resistant variants of Chinese hamster fibroblasts demonstrate increases in catalase activity. *Radiat. Res.* 1988; 114:114-124. PMID: 3353499
3. Spitz DR, Li GC, McCormick ML, Sun Y, Oberley LW: The isolation and partial characterization of stable H₂O₂-resistant variants of Chinese hamster fibroblasts. *Basic Life Sci* 1988; 49:549-552. PMID: 3250510
4. Spitz DR and Oberley LW: An assay for superoxide dismutase activity in mammalian tissue homogenates. *Anal. Biochem.* 1989; 179:8-18. PMID: 2547324
5. Spitz DR, Mackey MA, Li GC, Elwell JH, McCormick ML and Oberley LW: Relationship between changes in ploidy and stable cellular resistance to hydrogen peroxide. *J. Cell. Physiol.* 1989; 139:592-598. PMID: 2738104
6. Spitz DR and Li GC: Heat-induced cytotoxicity in H₂O₂-resistant Chinese hamster fibroblasts. *J. Cell. Physiol.* 1990; 142:255-260. PMID: 2303525
7. Spitz DR, Malcolm RR and Roberts RJ: Cytotoxicity and metabolism of 4-hydroxynonenal and 2-nonenal in H₂O₂-resistant cell lines: Do aldehydic by-products of lipid peroxidation contribute to oxidative stress? *Biochem. J.* 1990; 267:453-459. PMID: 2334404. PMCID: PMC1131310.
8. Spitz DR, Elwell JH, Sun Y, Oberley LW, Oberley TD, Sullivan SJ and Roberts RJ: Oxygen toxicity in control and H₂O₂-resistant Chinese hamster fibroblast cell lines. *Arch. Biochem. Biophys.* 1990; 279:249-260. PMID: 2350176
9. Peak MJ, Jones CA, Sedita BA, Dudek EJ, Spitz DR and Peak JG: Evidence that hydrogen peroxide generated by 365-nm UVA radiation is not important in mammalian cell killing. *Radiat. Res.* 1990; 123:220-223. PMID: 2389008
10. Freeman ML, Spitz DR and Meredith MJ: Does heat shock enhance oxidative stress? Studies with ferrous and ferric iron. *Radiat. Res.* 1990; 124:288-293. PMID: 2175921
11. Sullivan SJ, Roberts RJ and Spitz DR: Replacement of media in cell culture alters oxygen toxicity: Possible role of lipid aldehydes and glutathione transferases in O₂ toxicity. *J. Cell. Physiol.* 1991; 147:427-433. PMID: 2066363

12. Spitz DR, Sullivan SJ, Malcolm RR and Roberts RJ: Glutathione dependent metabolism and detoxification of 4-hydroxy-2-nonenal. *Free Radical Biol. Med.* 1991; 11:415-423. PMID: 1797627
13. Spitz DR, Adams DT, Sherman CM and Roberts RJ: Mechanisms of cellular resistance to hydrogen peroxide, hyperoxia and 4-hydroxy-2-nonenal toxicity: The significance of increased catalase activity in H₂O₂-resistant fibroblasts. *Arch. Biochem. Biophys.* 1992; 292:221-227. PMID: 1727639
14. Park YM, Anderson RL, Spitz DR, Hahn GM: Hypoxia and resistance to hydrogen peroxide confer resistance to tumor necrosis factor in murine L929 cells. *Radiat Res.* 1992; 131(2):162-168. PMID: 1641471
15. Sullivan SJ, Oberley TD, Roberts RJ and Spitz DR: A stable O₂-resistant cell line: Role of lipid peroxidation by-products in O₂-mediated injury. *Am. J. Physiol. (Lung Cell. Mol. Physiol.)* 1992; 262:L748-L756. PMID: 1616058
16. Kinter MT, Sullivan SJ, Roberts RJ and Spitz DR: Trace quantitation of 4-hydroxy-2-nonenal as its oxime, bis-T-butyltrimethylsilyl derivative using 3-hydroxynonanal as an internal standard. *J. Chromatog. Biomed. Appl.* 1992; 578:9-16.
17. Kim Y-M, Anderson RL, Spitz DR and Hahn GM: Hypoxia and resistance to hydrogen-peroxide confer resistance to TNF in murine L929 cells. *Radiat. Res.* 1992; 131:162-168.
18. Spitz DR, Kinter MT, Kehrer JP and Roberts RJ: The effect of monounsaturated and polyunsaturated fatty acids on O₂-toxicity in cultured cells. *Pediat. Res.* 1992; 32:366-372. PMID: 1408477
19. Goligorsky MS, Morgan MA, Lyubsky S, Gross RW, Adams DT and Spitz DR: Establishment of a hydrogen peroxide resistant variant of renal tubular epithelial cells: Role of calcium-independent phospholipase A₂ in cell damage. *Arch. Biochem. Biophys.* 1993; 301:119-128. PMID: 8442655
20. Spitz DR, Phillips JW, Adams DT, Sherman CM, Deen DF and Li GC: Cellular resistance to oxidative stress is accompanied by resistance to cisplatin: The significance of increased catalase activity and total glutathione in H₂O₂-resistant fibroblasts. *J. Cell. Physiol.* 1993; 156:72-79. PMID: 8314861
21. Warner B, Papes R, Heile M, Spitz D and Wispe J: Expression of human Mn-SOD in Chinese hamster ovary cells confers protection from oxidant injury. *Am. J. Physiol. (Lung Cell. Mol. Physiol.)*; 1993; 264:L598-L605.
22. Walker MW, Kinter MT, Roberts RJ and Spitz DR: Nitric oxide induced cytotoxicity: involvement of cellular resistance to oxidative stress and the role of glutathione in protection. *Pediat. Res.* 1995; 37:41-49. PMID: 7700733
23. Dennery PA, McDonagh AF, Spitz DR, Rodgers PA and Stevenson DK: Hyperbilirubinemia results in reduced oxidative injury in neonatal Gunn rats exposed to hyperoxia. *Free Radic. Biol. Med.* 1995; 19:395-404. PMID: 7590389
24. Winters R, Zukowski J, Ercal N, Matthews R and Spitz DR: Analysis of glutathione, glutathione disulfide, cysteine, homocysteine, and other biological thiols by high-

- performance liquid chromatography following derivatization by N-(1-Pyrenyl)maleimide. *Anal. Biochem.* 1995; 227:14-21. PMID: 766837
25. Spitz DR, Kinter MT and Roberts RJ: The contribution of increased glutathione content to mechanisms of oxidative stress resistance in hydrogen peroxide resistant hamster fibroblasts. *J. Cell. Physiol.* 1995; 165:600-609. PMID: 7593239
 26. Huot J, Houle FH, Spitz DR, and Landry J: HSP27 phosphorylation-mediated resistance against actin fragmentation and cell death induced by oxidative stress. *Cancer Res.* 1996; 56:273-279. PMID: 8542580
 27. Guyton KZ, Spitz DR, and Holbrook NJ: Expression of stress response genes GADD153, *c-jun*, and heme oxygenase-1 in H₂O₂- and O₂-resistant fibroblasts. *Free Radic. Biol. Med.* 1996; 20:735-741. PMID: 8721617
 28. Ercal N, Treeratphan P, Hammond TC, Matthews RH, Grannemann NH, and Spitz DR: *In Vivo* indices of oxidative stress in lead-exposed C57BL/6 mice are reduced by treatment with meso-2,3-dimercaptosuccinic acid or N-acetylcysteine. *Free Radic. Biol. Med.* 1996; 21:157-161. PMID: 8818630
 29. Ercal N, Oztezcan S, Hammond TC, Matthews RH, and Spitz DR: A high performance liquid chromatography assay for N-acetylcysteine in biological samples following derivatization with N-(1-pyrenyl)maleimide. *J. Chromatog. Biomed. Appl.* 1996; 685:329-334. PMID: 8953175
 30. Dennery PA, Wong HE, Sridhar KJ, Rodgers P, Sim JE, and Spitz DR: Differences in basal and hyperoxia associated heme oxygenase expression in oxidant resistant hamster fibroblasts. *Am. J. Physiol. (Lung Cell. Mol. Physiol.)* 1996; 271(15):L672-L679. PMID: 8897916
 31. Kinter MT, Spitz DR, and Roberts RJ: Oleic acid incorporation protects cultured hamster fibroblasts from oxygen-induced cytotoxicity. *J. Nutrition* 1996; 26:2952-2959. PMID: 9001361
 32. Dennery PA, Sridhar KJ, Lee CS, Wong HE, Shokoohi V, Rodgers PA, and Spitz DR: Heme oxygenase-mediated resistance to oxygen toxicity in hamster fibroblasts. *J. Biol. Chem.* 1997; 272:14937-14942. PMID: 9169465
 33. Sekhar KR, Meredith MJ, Kerr LD, Soltaninassab SR, Spitz DR, Xu ZQ, and Freeman ML: Expression of glutathione and γ -glutamylcysteine synthetase mRNA is JUN dependent. *Biochem. Biophys. Res. Comm.* 1997; 234:588-593. PMID: 9175757
 34. Goswami PC, Albee LD, Spitz DR, and Ridnour LA: A polymerase chain reaction assay for simultaneous detection and quantitation of proto-oncogene and GAPD mRNAs in different cell growth states. *Cell Prolif.* 1997; 30(6-7): 271-282. PMID: 9451418
 35. Brown KE, Kinter MT, Oberley TD, Freeman ML, Frierson HG, Ridnour LA, Tao Y, Oberley LW, and Spitz DR: Enhanced γ -glutamyl transpeptidase expression and selective loss of CuZn superoxide dismutase in hepatic iron overload. *Free Radic. Biol. Med.* 1998; 24:545-555. PMID: 9559866

36. Lee YJ, Galoforo SS, Berns CM, Chen JC, Davis BH, Sim JE, Corry PM, and Spitz DR: Glucose deprivation-induced cytotoxicity and alterations in mitogen-activated protein kinase activation are mediated by oxidative stress in multidrug-resistant human breast carcinoma cells. *J. Biol. Chem.* 1998; 273:5294-5299. PMID: 9478987
37. Dennery PA, Spitz DR, Lee CS, Shegog ML, and Poss KD: Oxygen toxicity and lung injury in mice lacking heme oxygenase-2. *J. Clin. Invest.* 1998; 101:1001-1011. PMID: 9486970. PMCID: PMC508651.
38. Bojes HK, Suresh PK, Mills EM, Sim JE, Spitz DR, Sim JE, and Kehrer JP: Bcl-2 and Bcl-xL in peroxide resistant A549 and U87MG cells. *Toxicol. Sci.* 1998; 42:109-116. PMID: 9579
39. Polavarapu R, Spitz DR, Follansbee MH, Sim JE, Oberley LW, Rahemtulla A, and Nanji AA: Increased lipid peroxidation and impaired antioxidant enzyme function is associated with pathological liver injury in experimental alcoholic liver disease in rats fed diets high in corn oil and fish oil. *Hepatology* 1998; 27:1317-1323. PMID: 9581686
40. Gurer H, Ozgunes H, Neal R, Spitz DR, and Ercal N: Antioxidant effects of N-acetylcysteine and succimer in red blood cells from lead-exposed rats. *Toxicology* 1998; 128:181-189. PMID: 9750041
41. Hunt CR, Sim JE, Featherstone T, Golden W, Von Kapp-Herr C, Hock RA, Gomez RA, Parsian AJ, and Spitz DR: Genomic instability and catalase gene amplification induced by chronic exposure to oxidative stress. *Cancer Res.* 1998; 58:3986-3992. PMID: 9731512
42. Ridnour LA, Winters RA, Ercal N, and Spitz DR: Measurement of glutathione, glutathione disulfide, and other thiols in mammalian cell and tissue homogenates using HPLC separation of N-(1-pyrenyl)maleimide derivatives. *Methods in Enzymology* 1999; 299:258-267. PMID: 9916204
43. Blackburn RV*, Spitz DR*, Liu X, Galoforo SS, Sim JE, Ridnour LA, Chen JC, Davis BH, Corry PM, and Lee YJ: Metabolic oxidative stress activates signal transduction and gene expression during glucose deprivation in human tumor cells. *Free Radic. Biol. Med.* 1999; 26:419-430. (*co-first authors) PMID: 9895234
44. Diamond DA, Parsian AJ, Hunt CR, Lofgren S, Spitz DR, Goswami PC and Gius D: Redox factor-1 (Ref-1) mediates the activation of AP-1 in HeLa and NIH 3T3 cells in response to heat shock. *J. Biol. Chem.* 1999; 274:16959-16964. PMID: 10358044
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- modulation of redox signaling. *Cancer Research*, 78:4(S); (P1-02-09), San Antonio Breast Cancer Symposium, San Antonio TX, Dec 05-09, 2017.
243. Rodman S, Howe J, Bellizzi A, Sciegienka S, O'Dorisio T, O'Dorisio S, Spitz D, and Fath M. Isolation and Characterization of Small Bowel Neuroendocrine Tumor Cell Line. *Pancreas*, 47(3):353, Mar 2018.
 244. Sciegienka S, Rodman S, Tomanek-Chalkley A, Lee D, Heer C, Gabr M, Falls K, O'Dorisio S, and Spitz D. Sensitizing hypoxic small cell lung cancer cells to radiation and hydrogen peroxide-producing agents using CuATSM. *Pancreas*, 47(3):354, Mar 2018.
 245. Zakharia Y, Garje R, Brown JA, Nepple KG, Dahmouh L, Gibson-Corley K, Spitz D, Milhem MM, and Rustum YM. Phase1 clinical trial of high doses of Seleno-L-methionine (SLM), in sequential combination with axitinib in previously treated and relapsed clear cell renal cell carcinoma (ccRCC) patients. *J Clinical Oncology*, 36(6):S:630; Genitourinary Cancers Symposium, San Francisco, CA. Feb 8-10, 2018.
 246. Falls KC, Gui K, Anderson M, Stolwijk J, Gibson A, Rodman S, Solst S, Fath M, McCormick M, and Spitz D. Disulfiram causes selective hypoxic cancer cell toxicity and radio-chemo-sensitization via redox cycling of copper. *RRS*, 2018 :(PS6-11), 64th Annual International Radiation Research Society Meeting, Chicago, IL, Sep 23-27, 2018.
 247. Rosa E, Allen BG, Mapuskar Km Clintron-Perez C, Shin M-K, Choung V, Schoenfeld J, Sibenaller Z, Buatti J, Spitz D, and Pieper A. Treatment with P73-A20 protects mice from neurocognitive decline following whole brain radiation therapy. *RRS*, 2018:(PS7-33), 64th Annual International Radiation Research Society Meeting, Chicago, IL, Sep 23-27, 2018.
 248. Story MD, Sishc BJ, Polsdofer EM, Bloom DA, Heer C, Spitz DR, Saha D. The Radioprotector GC4419 Ameliorates Radiation Induced Lung Fibrosis While Enhancing the Response of Non-Small Cell Lung Cancer Tumors to High Dose per Fraction Radiation Exposures. *International Journal of Radiation Oncology Biology Physics*, 102(3): S187-S187(S); 1058, 60th Annual Meeting of the American-Society-for-Radiation-Oncology (ASTRO), San Antonio, TX, Oct 21st-24th, 2018.
 249. Stolwijk J, Wagner B, McCormick M, Zakharia Y, Spitz D, and Buettner G. Optimization of selenium in cell culture media to maximize selenoenzyme activity. *FRBM*, 128(1):S1;121. SFRBM's 25th Annual Meeting, Chicago, IL, Nov 14-18, 2018.
 250. Heer C, Inturi R, Hubert K, Sciegienka S, Mapuskar K, Riffe D, and Spitz D. Induction of metabolic oxidative stress and sensitization to radio-chemotherapies via targeting of NAMPT. *FRBM*, 128(1):S1;66-67. SFRBM's 25th Annual Meeting, Chicago, IL, Nov 14-18, 2018.
 251. Hubert K, Butler A, Gui K, Anderson M, Stolwijk J, Gibson A, Rodman S, Heer C, Solst S, Fath M, McCormick M, and Spitz D. Disulfiram causes selective hypoxic cancer cell toxicity and radio-chemo-sensitization via redox cycling of copper.

- FRBM, 128(1):S1;67. SFRBM's 25th Annual Meeting, Chicago, IL, Nov 14-18, 2018.
252. Waldron T, Flynn R, St-Aubin J, Spitz D, Buatti J. Proposal for a dedicated research FLASH Irradiation System. RRS, 2019:(PS2-42), 65th Annual International Radiation Research Society Meeting, San Diego, CA. Nov 3-6, 2019.
 253. Spitz DR, Buettner GR, Petronek MS, St-Aubin JJ, Flynn RT, Waldron TJ, et al. An integrated physico-chemical approach for explaining the differential impact of FLASH versus conventional dose rate irradiation on cancer and normal tissue responses. Radiother Oncol. 2019. RRS, 2019; (TR8-01), 65th Annual International Radiation Research Society Meeting, San Diego, CA. Nov 3-6, 2019.
 254. Hubert KC, Butler A, Gui K, Li M, Stolwijk J, Gibson A, Rodman S, Solst S, Tomanek-Chalkley A, Searby C, Fath M, McCormick M, Spitz DR. Disulfiram causes selective hypoxic cancer cell toxicity and radio-chemo-sensitization via redox cycling of copper. 2019. RRS, 2019; (S222-05), 65th Annual International Radiation Research Society Meeting, San Diego, CA. Nov 3-6, 2019.
 255. Fath MA, Liu D, Bellizzi A, Menda Y, Spitz D, O'Dorisio S. Targeting CXCR4 and thioredoxin reductase in high grade neuroendocrine tumors. 2019. RRS, 2019; (S4-03), 65th Annual International Radiation Research Society Meeting, San Diego, CA. Nov 3-6, 2019.
 256. Ali MY, Oliva CR, Son T, Flor S, Spitz DR, Griguer CE. Cytochrome c Oxidase Subunit 4 Regulates Resistance to Radiation in Human Glioblastoma Cells. 2019. S118; SfrBM's 26th Annual Meeting, Las Vegas, NV. Nov 20-23, 2019
 257. Butler AL, Falls-Hubert KC, Fath MA, Spitz DR. Disulfiram Induces Radio-Chemo-Sensitization in Small Cell Lung Cancer and Enhances the Toxicity of Thioredoxin Reductase Inhibition and GSH Depletion. 2019. S119; SfrBM'. 26th Annual Meeting, Las Vegas, NV. Nov 20-23, 2019
 258. Heer CD, Inturi RA, Pulliam C, Scigienka A, Riffe DB, Mapuskar KA, Spitz DR. Pharmacologic Inhibition of NAMPT Induces Metabolic Oxidative Stress and Radio-Chemo-Sensitization in NSCLC. 2019. S130; SfrBM's 26th Annual Meeting, Las Vegas, NV. Nov 20-23 2019.
 259. Hubert K, Butler A, Gui K, Anderson M, Stolwijk J, Gibson A, Rodman S, Heer C, Solst S, Fath M, McCormick M, Spitz D. Disulfiram causes selective hypoxic cancer cell toxicity and radio-chemo-sensitization via redox cycling of copper. S132; SfrBM's 25th Annual Meeting, Chicago, IL, Nov 14-18, 2018.
 260. Inturi R, Heer C, Spitz DR, Bailey DC. Simultaneous Inhibition of SIRT 1 and SIRT 2 Induces Metabolic Oxidative Stress and Sensitizes Non-small Cell Lung Cancer to Pharmacological Ascorbate. S133; SfrBM's 26th Annual Meeting, Las Vegas, NV, Nov 20-23, 2019.
 261. Ngouajio AL, Riffe DB, Heer CD, Spitz DR. Thioredoxin Reductase Inhibition Sensitizes Erlotinib-resistant Head and Neck Cancer Cells to Radio-Chemotherapy. S149; SfrBM's 26th Annual Meeting, Las Vegas, NE, Nov 20-23, 2019.

262. Fath MA, Liu DJ, Menda Y, Bellizzi A, Spitz DR, O'Dorisio MS: Targeting CXCR4 and Thioredoxin reductase in High Grade Neuroendocrine Tumors; SFRBM Orlando FL; November 2020.
263. Steinbach EJ, Monga V, Laux DE, Furqan M, Jetton JG, Zepeda-Orozco D, Saunders DP, Dunlap NE, Curtis A, Fairbanks R, Anderson CM, Beardsley RB, Holmlund JT, Spitz DR, Allen BG: Effects of GC4419 on Chronic Kidney Disease in Head & Neck Cancer Patients Treated with Radiation and Cisplatin. ASCO, 2020.

Areas of Research Interest and Current Projects

My research focus is the study of free radicals and oxidative stress in biology and medicine. Ongoing projects include studying the roles of superoxide and hydrogen peroxide as well as redox active metal ions in cancer biology and therapy using pharmacological ascorbate/SOD mimics/FLASH radiation, studying molecular mechanisms of resistance to oxidative stress in cancer biology, studying redox regulation of the cell cycle, redox regulation of signal transduction, radiation biology, and redox regulated gene expression as well as metabolic oxidative stress associated with glucose deprivation-induced cytotoxicity in human tumor cells. Our long-term goal is to use a basic science understanding of mechanisms associated with free radical biology to elucidate novel methods for manipulating clinically significant outcomes in areas of medicine relevant to cancer biology and degenerative diseases associated with aging. Our laboratory also has many collaborative interactions with investigators working the fields of redox biology and medicine, imaging, and clinical trials. In this regard, our laboratory is a highly interdisciplinary research team, well integrated in many areas where oxidative stress and free radical biology potentially impact the biomedical research community.

Grants received

Active;

1. T32 CA078586 Spitz (PI) 05/01/11 - 07/31/25 1.20 Cal Months
NIH/NCI \$339,129/yr direct costs

Training Program in Free Radical and Radiation Biology

The goal is to train students in free radical and radiation biology at both the predoctoral and postdoctoral levels.

2. R21 CA256301 Spitz (PD/PI), Sheffield (MPI) 10/01/20 - 09/30/22
0.60 Cal Months

NIH/NCI \$150,000/direct/yr

Evaluation of Orthogonally Oriented Electromagnetic Fields to Stabilize ROS, Induce DNA damage and Improve Survival in Non-Small Cell Lung Cancer

The purpose of this grant is to evaluate the efficacy of orthogonally oriented electromagnetic fields in models of lung cancer to improve cancer therapy responses.

3. P30 CA086862 Weiner (PI), Spitz (Program Leader; Core Director) 08/15/05 - 03/31/26
2.4 Cal Months NIH/NCI \$121,610 direct costs/yr
Cancer Center Support Grant (CCSG)

This cancer center support grant is to support the research activities of the Holden Comprehensive Cancer Center at The University of Iowa. My role is to provide services and scientific input as the Director of the Radiation and Free Radical Research Core lab, the T32 program, and the Co-director of the Free Radical Metabolism and Imaging Program.

4. P01 CA217797 Cullen (PD/PI), Spitz (MPI, Project 2 Leader) 09/19/18 - 08/31/23
3.00 Cal Months NIH/NCI \$1,238,886 direct costs/yr

Exploiting Redox Metabolism Using Pharmacological Ascorbate for Cancer Therapy
The proposed studies will have a significant impact on the rapid development of pharmacological ascorbate as an agent to increase treatment efficacy.

5. P01 CA244091 Limoli (PI), Spitz (Subaward PI; Project 4 Co-Lead) 06/01/20 - 05/31/25
0.60 Cal Months NIH/NCI – Pass thru UC-Irvine \$65,000 direct costs/yr (Iowa Subaward)
Increasing the therapeutic index of brain tumor treatment through innovative FLASH radiotherapy

The goal of this project is to study redox biology mechanisms responsible for normal tissue sparing during FLASH radiation.

6. P50 CA174521-05S2 O'Dorisio (PI), Spitz (Project 1 Co-Lead, DRP Director) 10/01/20 - 9/31/22 1.2 Cal Months NIH/NCI - \$979,757 direct cost/yr

Neuroendocrine Tumor (NET) Specialized Programs of Research Excellence in Human Cancer

The goal of Project 1 is to develop a combined modality approach for PRRT based on redox biology

7. PO 748 Galera Therapeutics, Inc. Spitz (PI) 03/01/21 - 8/31/22

0.30 Cal Months PO 748 \$322,453 total direct costs

Enhancing Cancer Cell Killing via H₂O₂-mediated Metabolic Oxidative Stress Using SOD Mimics

The goal of this project is to determine if intracellular hydrogen peroxide mediates the selective cytotoxicity of SOD mimics in human breast and lung cancer cells, when compared to normal cells.

8. R50 CA243693 Fath (PI) 09/17/19 – 08/31/24 0.60 Cal Months
NIH/NCI - \$100,406 direct costs/yr

Repurposing redox active agents for exploiting differences in cancer cell metabolism for improving cancer therapy

The goal of this project is to continue to study mechanisms involving metabolic oxidative stress and redox active metal ions that account for the selective sensitization of cancer cells to radio-chemo-therapy.

Spitz Role: Other Significant Contributor – Unit Director

9. R01 HL152104-01 London (PI), Spitz (Co-I) 04/01/20 - 03/31/24 0.60 Cal Months
NIH/NHLBI - \$306,113 direct cost/yr

Mechanisms of Arrhythmias Following Cardiac Irradiation

The goal of this project is to determine mechanisms related to nitric oxide, superoxide, and oxidative metabolism in cardiac injury during radiotherapy.

10. R01 EY031544-01 Grumbach (PI), Spitz (Co-I) 05/01/20 - 04/30/25 0.30 Cal Months

NIH/NEI - \$317,971 direct cost/yr

Laser speckle flowgraphy as early indicator of microvasculopathy in radiation-induced vision loss

The proposed research aims at dissecting the mechanisms of vision loss in patients after treatment for uveal melanoma and developing mechanism-based treatments.

11. R01 DK104998 Taylor (PI), Spitz (Co-I) 07/01/20 - 06/30/23 0.36 Cal Months
NIH/NIDDKD - \$290,376 direct cost/yr

Regulation of Hepatic Macronutrient Metabolism by Mitochondrial Citrate Transport

The overall goal of this project is to understand how the hepatic citrate carrier contributes to fundamental metabolism and type 2 diabetes pathophysiology.

Pending:

1) U54CA274227 Buatti (PD/PI), Spitz, Hyer (MPIs) 7/1/22-6/30/27

Redox Metabolism ROBIN NIH/NCI - \$1,000,000 direct/yr

Radiation Oncology-Biology integration Network Center Grant

2) R01 CA261904-01 Allen (PD/PI), Spitz (MPI)

1.2 Cal Months NIH/NCI \$400,000 direct costs/yr

Targeting mitochondrial assembly to mitigate age-associated normal tissue injury from cancer therapy

The proposed studies will have a significant impact on the rapid development of mitigation strategies for normal tissue damage during cancer therapy.

This grant is being revised.

3. P50 CA174521-05A1 O'Doriso (PI), Spitz (Project 1 Co-Lead, DRP Director) 9/01/21 - 8/31/26 1.2 Cal Months NIH/NCI - \$1,300,000 direct cost/yr

Neuroendocrine Tumor (NET) Specialized Programs of Research Excellence in Human Cancer

The goal of Project 1 is to develop a combined modality approach for PRRT based on redox biology and CXCR4 targeting.

This grant was reviewed at NCI SPORE (P50) Review Panel V on 2/28/21 and received an impact score of 25. This is currently being revised.

Past:

1. "Role of Diffusible Cytotoxins in O₂-Induced Lung Injury", 1988-1992, NIH RO1 HL42057, Co-Principal Investigator, Total Direct Costs - \$380,000.
2. "Molecular Biology of Catalase Gene Expression in O₂-Resistant Cells", 1992-1993, Children's Medical Center Grant (University of Virginia), Co-Principal Investigator, \$9,000.
3. "Basic Mechanisms of Growth and Development", 1991-1995; NIH Child Health Research Center Grant, Core Laboratory Supervisor, Total Direct Costs - \$1,400,000.
4. "Role of Diffusible Cytotoxins in O₂-Induced Lung Injury", 1992-1995, NIH RO1 HL42057, Principal Investigator (competitive renewal), Total Direct Costs \$300,000.
5. Project Leader, Project 2 of "Nuclear Determinants of Therapeutic Response", 1993 - 1995, NCI Program Project PO1 CA51116, Total Direct Costs-\$2,018,686.
6. Principal Investigator, "Nitric Oxide-Induced Cell Injury: Molecular Mechanisms", 1994-2004, NIH RO1 HL51469, Total Direct Costs - \$1,461,000 (total costs \$2,217,000).
7. "Cellular Stress Response and Radiosensitivity" 1997-2002, NCI Program Project PO1CA75556, Dr. Spitz was Project 4 Leader (Oxidative stress and Heat-Induced Radiosensitization), Total direct costs available to Project 4 - \$550,000 (this project stayed at Wash. U. when Dr. Spitz moved to Iowa).
8. "Nitric Oxide-Induced Stress Response: Role of Glutathione" 1997-2000, NIH NRSA F32 ES05781, Dr. Lisa A. Ridnour-PI, (Dr. Spitz-Sponsor) Total direct costs - \$92,700 - this represented 3 years salary support for Dr. Ridnour and \$4000/yr for expenses while she was a fellow in Dr. Spitz's lab.
9. "Molecular Imaging of Responses to Cancer Therapy" NIH P20 CA91709, 2001-2004, Spitz Project 1 Leader (10% effort): "Metabolism of Glucose and Cancer Therapy" total direct costs - \$105,000 for Spitz Project.
10. "Metabolic Oxidative Stress and Cancer" Carver Collaborative Translational Research Pilot Grant, Holden Comprehensive Cancer Center, Spitz – PI, \$20,000, 2002.

11. "SOD Mimics and Cancer Therapy", MetaPhore Pharmaceuticals, St. Louis, MO, \$15,000 total direct costs, 2000-2004, Spitz Principal Investigator.
12. "Cellular Responses to Low Dose/Very Low Dose Rate Ionizing Radiation: Role of Endogenous Oxidative Metabolism", DOE DE-FG02-02ER63447, 9/1/02-8/29/05, Spitz Co-investigator, \$120,000 total direct costs for Spitz.
13. "Oxidative Events in Cancer Therapy" NIH P01 CA66081-05, 7/23/01-6/30/06, Spitz Co-director Antioxidant Enzyme Core, \$17,000/yr direct costs for Spitz.
14. "NF-kB and MnSOD in Radiation Induced-Response", DOE DE-FG02-03ER63634, 10/1/03 - 9/30/06, Spitz Co-investigator, \$18,500/yr direct costs for Spitz.
15. "Mitochondrial Metabolic Defects and Cancer", NIH Kirschstein NRSA F32 CA110611, 06/01/04 – 05/31/07, Aykin-Burns (PI) 100% effort and salary support, \$43,000/yr, Spitz (Sponsor of this post-doctoral training grant)
16. "Mitochondrial-Derived Oxidants and Cellular Responses to Low Dose/Low LET Ionizing Radiation", DOE DE-FG02-02ER63447, Total Direct Costs - \$675,000 (\$1,000, 000 total costs), 05/15/05 – 05/14/08, Spitz, Principal Investigator, 20% effort and salary support
17. "DOE - In Vivo Mammalian Tissue Response to Low Dose Ionizing Radiation: The Role of Oxidative Metabolism and Intercellular Communication" DE-FG02-02ER63447, 01/01/07 - 12/31/08, Azzam (PI), Spitz (Co-Investigator)
18. "Enhanced Apoptosis by Targeting Protein Redox Status", NIH R01 CA112184, 12/01/05 - 11/30/09, Natarajan (PI), Spitz (Co-Investigator)
19. "Metabolic Oxidative Stress in Human Cancer Cells", NIH R01 CA100045, 04/01/04 - 01/31/10, Spitz (PI)
20. "Glutathione Peroxidase and Redox State in Atherosclerosis", NIH R01 HL081750, Miller (PI); Spitz (Co-Investigator)
21. NIH -University of Iowa Clinical and Translational Science Program, "Enhancement of Lung Cancer Therapy Using Ketogenic Diets", UL1 RR024979, 12/01/09 - 08/31/10, Rosenthal (PI), Spitz (Project Leader)
22. "Enhancement of Cancer Therapy using Ketogenic Diets", NIH R21 CA139182, 07/01/02 – 12/30/11, Spitz (PI)
23. "Oxidative Stress in NSAID-induced IBD: Role of IL-17 and NADPH Oxidases Veterans Affairs Merit Award", 09/01/09 - 12/31/12 Berg (PI), Spitz (Co-Investigator).
24. "Mitochondrial-Derived Oxidants and Cellular Responses to Low Dose/Low LET Ionizing Radiation", DOE/NASA DE-SC0000830, 07/01/09 – 06/31/13, Spitz (PI)
25. "Target MKP-1 for Therapy Resistant Breast Cancer Stem Cells"; NIH R01 CA152313; 04/01/11 – 03/31/16; Li-PI Spitz (Co-I).
26. "The Use of 2-Deoxyglucose in Head and Neck Cancer Therapy"; NIH R01 CA133114; 12/01/08 - 11/30/14; Spitz (PI).

27. "Using Ketogenic Diets to Enhance Radio-Chemo-Therapy Response: A Phase I Trial" NIH R21 CA161182-01; 09/15/2011 - 08/31/2015; Spitz (PI); Berg and Buatti (CoPIs).
28. "Cigarette Smoke and Autophagy/Lysosomal Pathway Dysfunction" NIH R01 HL096625, 07/01/10 - 04/30/14 Monick (PI); Spitz (Co-I)
29. "CaMKII in Sinus Node Physiology and Disease" R01 HL096652 Anderson (PI), Spitz (Co-I) 08/19/13 - 07/31/15.
30. "Targeting the NLRP3 Inflammasome to Limit Pathologic Sterile Inflammation" R56 AI118719 Sutterwala (PI), Spitz (Co-I) 08/01/15 - 07/31/16
31. "Pharmacological Ascorbate as an Adjuvant to NSCLC Therapy" JF2014-1 Allen (PI); Spitz (Mentor) 07/01/14 - 06/30/16 American Society for Radiation Oncology
32. "Loss of Mitochondrial Sirt3, Decreased MnSOD Activity, and IR Induced Genomic Instability" NIH R01 CA152601 Gius (PI), Spitz (Co-I) 04/01/15 - 07/1/16
33. "Mechanism of Nlrp3 Inflammasome Activation by Mitochondrial Dysfunction" NIH R01AI104706 Cassel (PI); Spitz (Co-I) 12/01/13 - 11/30/16
34. Research Program of Excellence in Redox Biology and Medicine Roy J. Carver Trust (Spitz – PI) 04/01/12 - 03/30/18
35. Mitochondrial Targeted Metastatic Melanoma Therapy NIH K25 CA172218 Schultz (PI), Spitz (Mentor 5% effort) 07/01/13 - 06/30/18
36. Enhancing Metabolic Oxidative Stress and Therapy Responses in Cancer Stem Cells. NIH R01 CA182804 12/01/13 – 11/30/19 Spitz (PI)
37. Mechanism of lung cancer resistance to tyrosine kinase inhibitor and radiation treatments. R01 CA232587 Spitz (Co-I) 07/01/18 - 05/31/20 NIH/NCI
38. Pharmacological Ascorbate Combined with Radiation and Temozolomide in GBM G-17-1500 Allen (PI) 01/01/18 - 12/31/20 Spitz – Co-I, 2% effort
39. Selective targeting of tumor cell redox metabolism and DNA damage responses to enhance cancer therapy. F99 CA245722 Heer (PI) Spitz (sponsor)

Invited lectures

1. "Hydrogen Peroxide or Heat Shock Induces Resistance to Hydrogen Peroxide in Chinese Hamster Fibroblasts", University of Iowa, Iowa City, Iowa, 1987.
2. "Mechanisms of Adaptation to Hydrogen Peroxide", Washington University School of Medicine, St. Louis, Missouri, 1987.
3. "Antioxidant Enzyme Expression in H₂O₂-Resistant Fibroblasts", Bowman Gray Medical School, Winston-Salem, North Carolina, 1988.
4. "A Role for Aldehydic By-Products of Lipid Peroxidation in Oxidant Induced Injury", University of Iowa, Iowa City, Iowa, 1989.
5. "Do Aldehydic By-Products of Lipid Peroxidation Contribute to Oxidative Stress?" Radiation Oncology Branch, NIH/NCI, Bethesda, Maryland, 1989.
6. "Mechanisms of Cellular Adaptation to Oxygen Toxicity", Radiation Oncology Research Laboratory, University of California, San Francisco, San Francisco, California, 1989.

7. "Detoxification of Aldehydic By-Products of Lipid Peroxidation by Glutathione and Glutathione Transferases", Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, San Francisco, California, 1989.
8. "Aldehydic By-Products of Lipid Peroxidation Contribute to Oxidant Induced Injury", William Beaumont Hospital, Royal Oak, Michigan, 1990.
9. "A Role for Lipid Peroxidation in Oxygen Toxicity", University of Illinois-Champaign/Urbana, Urbana, Illinois, 1991.
10. "Gene Amplification of Catalase in H₂O₂ and O₂ Resistant Cells", Section of Cancer Biology, Washington University School of Medicine, St. Louis, Missouri, 1991.
11. "The Role of Aldehydic By-Products of Lipid Peroxidation in Oxygen Toxicity", University of Iowa, Iowa City, Iowa, 1991.
12. "Cellular Mechanisms of Adaptation to Oxidative Stress", Radiation Oncology Branch, NIH/NCI, Bethesda, Maryland, 1991.
13. "Adaptation to Oxidative Stress Confers Resistance to Cisplatin", Section of Cancer Biology, Washington University School of Medicine, St. Louis, Missouri, 1992.
14. "Cellular Mechanisms of Adaptation to Oxidative Stress", University of Rochester, Rochester, New York, 1992.
15. "Mammalian Cellular Mechanisms of Adaptation to Oxidative Stress", University of California, San Francisco, San Francisco, California, 1993.
16. "Cellular and Molecular Mechanisms of Resistance to Oxidant Mediated Toxicity", Stanford University, Stanford, California, 1993.
17. "Models of Oxidant Induced Toxicity Relevant for Testing SOD Mimics", Monsanto Corporation, Research Campus, St. Louis, Missouri, 1993.
18. "Mechanisms of Mammalian Cellular Resistance to H₂O₂- and O₂-Toxicity", Medical College of Wisconsin, Milwaukee, Wisconsin, 1994.
19. "Mechanisms of Mammalian Cellular Resistance to Oxygen- and Nitric Oxide-Mediated Toxicity", University of Kentucky, Lexington, Kentucky, 1994.
20. "Cellular and Molecular Mechanisms of Adaptation to Oxidative Stress in H₂O₂ and O₂ Resistant Cell Lines", Chemistry Department, University of Missouri, Rolla, Missouri, 1995.
21. "Mammalian Cellular Mechanisms of Resistance to Oxidative Stress Mediated by H₂O₂, 95% O₂, and Nitric Oxide", Dept. of Chemistry and Biochemistry, University of Quebec at Montreal, Montreal, Canada, 1995.
22. "Mechanisms of Cellular Resistance to Oxidative Stress in Tumor Cell Resistance to Therapy", Titus C. Evans Memorial Lecture, University of Iowa, Iowa City, Iowa, 1995.
23. "Mechanisms of Resistance to Oxidative Stress: Implications in Disease Processes", School of Public Health, Dept. of Environmental and Industrial Health, Division of Toxicology, University of Michigan, Ann Arbor, MI, 1997.

24. "Mechanisms of Resistance to Oxidative Stress Induced by Exposure to Nitric Oxide" Dept. of Pediatrics, Stanford University, Palo Alto, CA, 1997.
25. "Genomic Instability and Catalase Gene Amplification Induced by Chronic Exposure to Oxidative Stress" AECL Radiobiology Laboratories, Chalk River, Ontario, Canada, March, 1998.
26. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells" Reactive Oxygen Species Symposium: From Radiation to Molecular Biology and its Implications, Bethesda, Maryland, July, 1998.
27. "Genomic Instability and Catalase Gene Amplification Induced by Chronic Exposure to Metabolic Oxidative Stress" William Beaumont Research Institute Radiation Oncology Retreat, Royal Oak, MI, Sept., 1998.
28. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells" Department of Cell Biology Seminar, Cleveland Clinic Foundation, Cleveland, Ohio, Dec. 1998.
29. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells", Graduate Center for Toxicology Seminar Series, University of Kentucky, Lexington, KY, Jan. 1999.
30. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells", Radiation Oncology Research Seminar Series, University of Pennsylvania, Philadelphia, PA, Feb. 1999.
31. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells: A Fundamental Defect in Metabolism?" Free Radical and Radiation Biology Research Seminar, University of Iowa, Iowa City, IA, April, 1999.
32. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells", Mechanism of MnSOD Expression Meeting, Organized by The Division of Cancer Biology, National Cancer Institute, University of Kentucky, Lexington, KY, August, 1999.
33. "Research of Free Radicals in Medical Science", Dr. Douglas R. Spitz, Workshop Speaker and Leader, Faculty of Medical Technology, Mahidol University, Bangkok, Thailand, Sept. 20-22, 1999.
34. "NO-Induced Resistance to Oxidative Stress", UW-Madison EHS Center Spring 2000 Seminar Series: Horizons in Developmental and Molecular Toxicology, University of Wisconsin, Madison WI, March 27, 2000.
35. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells: A Fundamental Defect in Metabolism?", Grand Rounds Presentation, Comprehensive Cancer Center, University of Wisconsin, Madison WI, March 29, 2000.
36. "Genomic Instability and Catalase Gene Amplification Induced by Chronic Exposure to Oxidative Stress", Pathology and Laboratory Medicine Seminar, University of Wisconsin, Madison WI, March 29, 2000.
37. "How Metabolic Oxidation/Reduction Reactions Might Contribute to Cellular Responses to Ionizing Radiation", DOE/NASA Radiation Investigators Workshop, Washington DC, June 26th, 2001.

38. "Glucose Deprivation-Induced Oxidative Stress in Human Tumor Cells: A Fundamental Defect in Metabolism?" 29th Annual Meeting of the American Society of Photobiology, Chicago, IL, July 9th, 2001.
39. "Glucose deprivation-induced oxidative stress in human tumor cells: unifying metabolic and genetic theories of cancer?" Case Western Reserve University, Department of Physiology and Biophysics Seminar Series, Cleveland Ohio, Dec. 17th, 2001.
40. "Examples of biochemical mechanisms that might mediate bystander effects." Cancer Risk Assessment: Should New Science be Applied? Arlington VA, July 18th, 2002.
41. "Metabolic Oxidative Stress and Cancer" Invited seminar for the Radiation Biology Branch of the NCI, Bethesda MD, August 26th, 2002.
42. "Metabolic Oxidative Stress and Cancer" Invited lecturer for the 10th International Symposium of Korea Cancer Center Hospital, Seoul, Korea , September 13th, 2002.
43. "Metabolic Oxidative Stress and Cancer Therapy" Invited seminar, McMaster University, Hamilton, Ontario, Canada, October 21st, 2002.
44. "Glucose deprivation-induced oxidative stress in human tumor cells: unifying metabolic and genetic theories of cancer?" University of Arkansas Cancer Center Research Seminar, Little Rock, Arkansas, December 2nd, 2002.
45. "Antioxidant enzyme measurements: How to do it and what do all those UNITS mean!" 9th Annual Meeting of The Oxygen Society, San Antonio, Texas, November 20th, 2002.
46. Workshop I "Modulation of Stress-Induced Signalling by Normal and Mutated Regulators." 19th Annual Radiation and Biological Sciences Symposium, Washington University, St. Louis, MO, November 7-8, 2003.
47. "Metabolic Oxidative Stress and Cancer." Wake Forest University, Winston-Salem, NC, August 23-24, 2004.
48. "Metabolic Oxidative Stress and Cancer." Rosewell Park Cancer Institute, Buffalo, NY, September 29-October 1, 2004.
49. "Metabolic Oxidative Stress and Cancer." Medical College of Wisconsin, Milwaukee, WI, November 11-12, 2004.
50. "Follow the Electrons: An Integrated Approach to Understanding the Relationship Between Metabolism, Signal Transduction and Gene Expression." NIH sponsored oxidative stress symposium University of Kentucky, Graduate Center for Nutritional Sciences, Lexington, Kentucky April 2005.
51. "Metabolic Oxidative Stress and Cancer." NIH sponsored oxidative stress symposium University of Kentucky, Graduate Center for Nutritional Sciences, Lexington, Kentucky April 2005.
52. "Metabolic Oxidative Stress and Cancer" Albany Medical College, Center for Immunology and Microbial Disease, Albany, NY, September 17-19 2005.

53. "Metabolic oxidation/reduction reactions and cellular responses to ionizing radiation" Radiation Research Program Carcinogenesis Workshop at NCI, Washington DC, Sept. 10-12, 2006.
54. "Follow the Electrons: an integrated approach to understanding biology and medicine" The Denver Waldorf School, Denver CO, November 15, 2006.
55. "Metabolic Oxidative Stress and Cancer Therapy" International INMAS symposium on the "Applications of 2-deoxy-D-Glucose in the Management of Cancer" on November 8-10, 2006, Delhi, India.
56. "Metabolic Oxidative Stress and Cancer Therapy: Basic Science and Clinical Applications" International Symposium of Korea University on Recent Advances in Cancer Research" on January 23, 2007, Seoul, South Korea.
57. "Metabolic Oxidative Stress and Cancer" School of Health Sciences Seminar, Purdue University, Lafayette IN, March 6, 2007.
58. "Metabolic Oxidative Stress and Cancer" Department of Pathology and Laboratory Medicine Seminar, Medical University of South Carolina, Charleston SC, April 2, 2007.
59. "Metabolic Oxidative Stress and Cancer Therapy", Arizona Cancer Center Seminar-University of Arizona, Tucson, AZ, December 8-9, 2008.
60. "Metabolic Oxidative Stress and Implications for Cancer Therapy", South Dakota State University, Brookings, SD, April 29-30, 2009.
61. "Metabolic Oxidative Stress and Cancer Biology", Columbia University, New York, NY, June 4-5, 2009.
62. "Metabolic Oxidative Stress and Implications for Cancer Therapy", University of Arkansas for Medical Sciences, Little Rock, AR, September 25-28, 2009.
63. "Metabolic Oxidative Stress and Implications for Cancer Therapy", Seminar Series, Anderson Cancer Institute, Savannah Georgia, October 7, 2009.
64. "Oxidative Stress and Radiation Response", Low Dose Radiation Symposium, Hamilton, Ontario, Canada, August 2010.
65. "Metabolic Oxidative Stress and Cancer Therapy", Seminar Series, University of Nebraska Medical Center, Omaha, NE October, 2010.
66. "Metabolic Oxidative Stress in Cancer Biology and Therapy" Cancer Center Seminar Series, University of Chicago, Chicago, IL, 2010.
67. "Metabolic Oxidative Stress and Cancer Therapy", Monmouth College, Monmouth, IL, 2010.
68. "Metabolic Oxidative Stress and Cancer Biology", Grinnell College, Grinnell, IA, December, 2011.
69. "Metabolic Oxidative Stress in Cancer Biology and Therapy", University of Texas Health Sciences Center at San Antonio, April, 2012.

70. "Metabolic Oxidative Stress in Cancer Biology and Therapy", Banbury Conference on ROS and Cancer, Cold Spring Harbor, New York, February, 2013.
71. "Metabolic Oxidative Stress in Cancer Biology and Therapy", Department of Biochemistry Seminar, Georgetown University, Washington DC, March, 2013.
72. "Metabolic Oxidative Stress in Cancer Biology and Therapy", University of Alabama Birmingham, Birmingham, Alabama, April, 2013.
73. "Oxidative Stress in Cancer Biology and Therapy", Division of Medical Sciences Seminar Series, Northern Ontario School of Medicine, Sudbury, Ontario, Canada, October, 2013.
74. "The Use of Ketogenic Diets and Pharmacological Vitamin C to Enhance Responses to Radio-Chemo-Therapy via Metabolic Oxidative Stress" Division of Medical Sciences Seminar Series, Northern Ontario School of Medicine, Sudbury, Ontario, Canada, October, 2014.
75. "Metabolic Oxidative Stress in Cancer Biology and Therapy; from the bench to the bedside", North Dakota State University, Department of Pharmaceutical Sciences Seminar, Fargo, North Dakota, April 2015.
76. "Metabolic Oxidative Stress in Cancer Biology and Therapy; from the bench to the bedside", Van Andel Research Institute, Grand Rapids, Michigan, June 2015.
77. "Metabolic Oxidative Stress and Cancer Biology/Therapy: from the bench to the bedside", University of Kansas, Cancer Center Seminar, Kansas City MO; March 2016.
78. "Metabolic Oxidative Stress and Cancer Biology/Therapy: from the bench to the bedside and back again", University of Oklahoma Health Sciences Center, Oklahoma City, OK April 2016.
79. "Harnessing Redox Biology for Cancer Therapy: From the Bench to the Bedside", UC Davis Comprehensive Cancer Center, Davis CA, November 2017
80. Exploiting Redox Biology for Selectively Targeting Cancer Cells: Therapeutic Implications. University of Michigan, Ann Arbor MI, February 20, 2019.
81. "Metabolic Oxidative Stress in Cancer Biology and Therapy: From the Bench to the Bedside and Back to the Bench", MD Anderson Department of Molecular and Cellular Oncology, Dallas TX, May 1, 2019
82. "Exploiting redox biology for selectively targeting cancer cells: therapeutic implications" Washington University CBD Conference, St. Louis MO, September 6, 2019
82. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside" Michigan State University, Department of Biochemistry and Molecular Biology Seminar, East Lansing MI, December 5, 2019
83. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside and Back to the Bench" University of Oklahoma, Oklahoma City OK, December 12, 2019

84. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside" Medical College of Georgia, Augusta GA, December 2020
85. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside" Cold Spring Harbor Laboratory "Defeating Cancer" lecture series. Long Island New York, March 22, 2021.
86. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside" Oxford University. UK, June 2021.
87. "Targeting Redox Metabolism for Cancer Therapy: From the Bench to the Bedside" University of Miami Cancer Center Seminar, April 2021.

Conference presentations

1. "Oxidative Stress Responses Induced by Exposure to Hydrogen Peroxide": Invited Symposium, 37th Annual Meeting of the Radiation Research Society, Seattle, Washington, 1989.
2. "The Role of Aldehydic By-Products of Lipid Peroxidation in Oxygen Toxicity", Regional Meeting of the Oxygen Society, Bethesda, Maryland, 1991.
3. "Cellular Mechanisms of Resistance to Nitric Oxide-Mediated Toxicity" Radiation Research Society Meeting, San Jose, California, 1995.
4. "Mechanisms of Cellular Adaptation to Oxidative Stress in Human Disease" Human Anatomy and Physiology Society Meeting, St. Louis, MO, 1995.
5. "Cellular Mechanisms of Resistance to NO-Mediated Toxicity", Nitric Oxide: A New Frontier in Free Radical Research, Symposium at the University of Iowa, Iowa City, Iowa, 1995.
6. "Mechanisms of Resistance to Oxidative Stress" Gastroenterology Research Conference, Division of Gastroenterology and Hepatology, Saint Louis University Health Sciences Center, St. Louis MO, 1996.
7. "Mechanisms of Resistance to Hydrogen Peroxide and Tumor Cell Resistance to Therapy", in the Workshop on, "Oxidative Stress and Cellular Responses to Cancer Therapy", 45th Annual Meeting of the Radiation Research Society, Providence, Rhode Island, 1997.
8. "HPLC and Spectrophotometric Methods for the Detection of Intracellular Antioxidants ", in the Workshop on, "New Methods for the Detection of Free Radicals", 45th Annual Meeting of the Radiation Research Society, Providence, Rhode Island, 1997.
9. "Increased Prooxidant Production Induced by Exposure to 41.5°C Hyperthermia" Symposium on the "Role of Oxidative Stress in Biological Responses to Heat Shock", 46th Annual Meeting of the Radiation Research Society, Louisville, Kentucky, May, 1998.

10. "How Redox Determines Cellular Response to Radiation", Refresher Course, 47th Annual Meeting of the Radiation Research Society, Albuquerque, NM, May 2, 2000.
11. "Mitochondrial Metabolism and Oxidative Stress Responses Underlie Bystander Effects" LH Gray Workshop on the "Mechanisms of Radiation-Induced Bystander Effects", Dublin, Ireland, December 2-4, 2000.
12. "A Mechanistic Link Between Metabolism, Signal Transduction, and Gene Expression During Glucose Deprivation in Human Tumor Cells" 48th Annual Meeting of the Radiation Research Society, San Juan, Puerto Rico, April 25th, 2001.
13. "The role of thioredoxin and thioredoxin reductase in the regulation of AP-1 binding and gene expression in response to ionizing radiation" Mini-symposium 14 - Signaling II/Apoptosis, 48th Annual Meeting of the Radiation Research Society, San Juan, PR, April 21-25, 2001.
14. "Glucose deprivation-induced oxidative stress in human cancer cells: A fundamental defect in metabolism?" Plenary Lecture, Presidential Symposium, 49th Annual Meeting of the Radiation Research Society, Reno, NV, April 20-24, 2002.
15. "Redox regulation of signal transduction following exposure to ionizing radiation. Plenary Lecture, 49th Annual Meeting of the Radiation Research Society, Reno, NV, April 20-24, 2002.
16. "Antioxidant enzyme measurements: How to do it and what do all those units mean" Workshop Lecture, 9th Annual meeting of the Oxygen Society, San Antonio, TX, November 2002.
17. "Metabolic Oxidative Stress and Cancer" Lecture in the Reactive Oxygen Species and Cancer Symposium (also Co-Chaired by Dr. Spitz) 12th Biennial Meeting of the Society for Free Radical Research, Buenos Aires, Argentina, May 5-9, 2004.
18. "A mutation in succinate dehydrogenase subunit C (SDHC) confers sensitivity to low dose ionizing radiation" Lecture at the Mitochondria and Radiation Response Symposium, 52nd Meeting of the Radiation Research Society of America, Denver, Colorado, USA, October 16-19, 2005.
19. "Metabolic Oxidative stress and Cancer Therapy" Invited platform presentation at the World Conference on Interventional Oncology, Lake Como, Cernobbio, Italy, June 12-16, 2006.
21. "Mitochondrial-Derived Oxidants and Cellular Responses to Low Dose/Low LET Ionizing Radiation" DOE low dose radiation workshop platform presentation. Washington DC, August 2, 2006.
22. "Radio-Oxidative Stress/Inflammation" Chair of Plenary Session 1, DOE Low Dose Radiation Research Investigators' Workshop VII, Washington DC, January 21-23, 2008.
23. "Metabolic Oxidative Stress and Cancer Therapy" International Conference on Radiation Biology & Translational Research in Radiation Research (IJRR). Jaipur, India, November 10-12, 2008.

23. "Metabolic Oxidative Stress and Radiation Responses: Are Mitochondria Involved?", International Symposium of Kyoto University RRI, Kumatori, Japan, December 16-20, 2008.
24. "Evidence of Mitochondrial Abnormalities in Radiation-Induced Genomically Unstable Mammalian Cells" 54th Annual Meeting, Radiation Research Society, Boston, MA, September 21-24, 2008.
25. "Mitochondrial ROS" Workshop, 54th Annual Meeting, Radiation Research Society, Boston, MA, September 21-24, 2008.
26. "Metabolic Oxidative Stress and Radiation Responses: Are Mitochondria Involved?" CENTRII 2009, Medical College of Wisconsin, Milwaukee, WI, April 1-2, 2009.
27. "Superoxide and Hydrogen Peroxide-Mediated Metabolic Oxidative Stress: Implications for Cancer Therapy." Topical Review, 55th Annual Meeting, Radiation Research Society, Savannah GA, October 4-7, 2009.
28. "Metabolic Oxidative Stress and Radiation Responses: Are Mitochondria Involved?", Scholars in Training "What's Hot" symposium, 55th Annual Meeting, Radiation Research Society, Savannah GA, October 4-7, 2009.
29. "The Role of Mitochondrial-ROS Metabolism to Affect Carcinogenesis by Distinct Mechanisms", Plenary Session I DOE Low Dose Radiation Research Program, Bethesda, MD, 2011.
30. "Metabolic Oxidative Stress and Cancer." 18th Annual Meeting Society for Free Radical and Radiation Biology Medicine, Atlanta, GA. November 17-20, 2011.
31. "Metabolic Oxidative Stress and Radiotherapy: Where the Radiolysis of H₂O Meets Mitochondrial Electron Transport", Scholars in Training "What's Hot" symposium, 58th Radiation Research Society Annual Meeting, San Juan Puerto Rico, September 2012.
32. "Metabolic Oxidative Stress in Cancer Biology and Therapy", Plenary Lecture, Korean Society for Biochemistry and Molecule Biology, Seoul, South Korea, May 2013.
32. "Metabolic Oxidative Stress in Cancer Biology and Therapy", Plenary Lecture, Society for Free Radical Research-Asia, Taipei, Taiwan, October 2013.
33. "The Role of Redox Biology in Radiation Responses," 59th Annual meeting of the Radiation Research Society, New Orleans, LA. September 15-18, 2013.
34. "ROS in Cancer Biology and Therapy", Oxygen Radical Gordon Conference, Ventura CA, February 7-11, 2016.
35. Bob Painter Debates "This House Believes That Cancer is Fundamentally a Metabolic Disease", 62nd Annual Meeting of the Radiation Research Society, The Big Island of Hawaii, October 16-19, 2016.
36. "Harnessing Redox Biology for Improving Cancer Therapy Outcomes while Protecting Normal Tissue" Topical Review, 63rd Annual Meeting of the Radiation Research Society, Cancun, Mexico, October 15-18, 2017.

37. "Targeting Redox Metabolism for Cancer Therapy: from the bench to the bedside" Plenary lecture, 24th Annual Meeting of the Society for Redox Biology and Medicine, Baltimore MD, Nov 29 – Dec 2, 2017.
38. "Oxygen Chemistry: ROS, Radicals, and Reactivity" Invited Speaker 2018 Sunrise Free Radical School; SFRBM Annual Meeting, Chicago, IL November, 2018.
39. "Exploiting redox biology for selectively targeting cancer cells: therapeutic implications" Forum on Signaling Pathways and Non-coding RNAs in Carcinogenesis, Prevention and Therapy of Malignant Tumors: University of Iowa; Iowa City, May 2019
40. "Exploiting redox biology for selectively targeting cancer cells: from the bench to the bedside" 2019 University of Kentucky Cancer and Metabolism Symposium, Lexington KY, July 2019.
41. "Exploiting redox biology for selectively targeting cancer cells: from the bench to the bedside" Linus Pauling Institute Symposium, Oregon State University, Corvallis, Oregon, August 11, 2019.
42. "Exploiting redox biology for selectively targeting cancer cells: therapeutic implications" International Congress of Radiation Research; Manchester, UK, August 28, 2019.
43. "Aging, Cancer, and Diabetes: Mechanisms in Common?" University of Iowa HCCC/FOEDRC/OREI Conference, Iowa City, September 14, 2019
44. "Physico-chemical Properties of FLASH-RT: Mechanisms of Differential Effects on Normal versus Tumor Tissue" ASTRO, 2020.
45. "Physico-chemical Properties of FLASH-RT: Mechanisms of Differential Effects on Normal versus Tumor Tissue" Radiation Research Society Presidential Symposium, 2020.
46. "Exploiting Redox Biology for selectively targeting cancer cells" AACR conference on Radiation Science and Medicine. March 3, 2021.
47. "Utilizing Avasopasm Manganese (GC4419) SOD Mimetic to Protect Normal Tissues While Enhancing Tumor Responses to Hypo-fractionated Radiation" SFRBM, November 2021.
48. FLASH radiotherapy from a multidisciplinary perspective: A review of what is known, and what needs to be explored, in chemistry and biology. ESTRO-ASTRO Session 8-30-21.
49. FLASH mechanisms chemistry: A review of what is known, and what needs to be explored, in the chemistry and biology of FLASH. FRPT Vienna Austria, December 2021.

Pending decisions (grant proposals, Patent applications, book contracts):

1. Anderson ME, Spitz DR et al, Direct oxidation of calcium/calmodulin dependent protein kinase II and associated diagnostic and therapeutic methods; US Patent No 20100226929 A1, 2010.
2. Spitz DR, Schultz MK, Aykin-Burns N, Zhu Y, Kloepping KC. "MOLECULAR

- “THERAPY OF CANCER”, USPA 61/514,640; Aug, 2011.
3. Schultz MK, Spitz DR, Kloepping KC. MITOCHONDRIAL TARGETED THERAPY FOR CANCER. UIRF 13039, VHP 17023.132PV1. USPA US 61/762,771; FEB, 2013.
 4. Anderson ME, Joiner MA, Salem AK, Wongrakpanich A, Domann FE, Hall DD, Koval OM, Spitz DR: U.S. Application No. 14/017,847; “MITOCHONDRIAL-TARGETED CATIONIC NANOPARTICLES COMPRISING CAMKII INHIBITORS AND USES THEREOF FOR TREATING AND PREVENTING DISEASES AND DISORDERS ASSOCIATED WITH CAMKII ACTIVITY” Patent #US9,168,307 B2; October 27, 2015.

IV. SERVICE

A. Offices held in professional organizations (least to most recent)

American Association for the Advancement of Science, member
 Radiation Research Society, council member and chairman of the membership committee, program committee
 North American Hyperthermia Society, Councilor and member
 New York Academy of Sciences - member
 Society for Free Radical (Redox) Biology and Medicine/International Society for Free Radical Research member, council member, program committee member, young investigator award committee member
 Society of Toxicology, member
 American Association for Cancer Research, member

(Editorships)

Editorial Board—***Toxicology Letters*** (1995-2000)
 Editorial Board—***Free Radical Biology and Medicine*** (2001 – present)
 Editorial Board – ***Cancer Research*** (2013-present)
 Editorial Board – ***Cancer Letters*** (2009-2014)
 Editorial Board – ***Radiation Research*** (2013-present)
 Editorial Board – ***Antioxidants*** (2020-present)

(Review panels: Committees)

VA Medical Center Grants - University of Wisconsin
 University of Kentucky Association for Medical Research Grants
 External Review Committee - University of Iowa
 (Program Project entitled “Oral Mucosal Disease in Aging”)
 VA Merit Awards
 NCI, Canada
 Allegheny/Singer Research Foundation
 Health Effects Institute
 William Beaumont Research Institute
 Washington University Cancer Center ACS Grant Review Committee

Medical Research Council (MRC) of Canada
Alberta Heritage Foundation for Medical Research
DOE Low Dose Radiation Grant Review Panel
Young Investigator Award Committee Oxygen Society
Councilor and Outreach Committee Member, Society for Free Radical Biology and
Medicine
NASA Radiation Biology Study Section
Canadian Institute of Health Research
COBRE External Advisory Panel for Marshall University
Phillip Morris Research Program
External Advisory Board, NASA
COBRE External Advisory Panel for University of Arkansas Medical Sciences
COBRE External Advisory Panel for University of Kentucky

(Review panels: NIH Committees)

NIDR - Oral Medicine and Biology Study Section (ad hoc Reviewer) - 1994
NHLBI - Toxicology Study Section *Tox1* (ad hoc Reviewer) - 1995
NCI - Radiation Study Section (ad hoc Reviewer) – 1995
NIEHS - Special Emphasis Panel RFA 96-007 (ad hoc Reviewer) – 1996
SBIR ZRG1 RAD(05) - Special Emphasis Panel (ad hoc Reviewer) – 1999
NIEHS - Superfund Basic Research Program (ad hoc Reviewer) – 1999
NIH - Toxicology Study Section *A/Tox1* (ad hoc Reviewer) - 2002
NICHD – ZHD1 DRG-A (CA) Special Emphasis Panel (ad hoc Reviewer) – 2004.
NIH/NCI ZRG1 ONC-L 02 B, Special Study Section, DNA damage and mutagenesis
(ad hoc Reviewer) – 2004 and 2005
NIH/NCI Radiation Therapeutics and Biology (RTB) Study Section (ad hoc
Reviewer) – 3 cycles in 2005; (full member) – 2006-2010.
NIH/NHLBI, P01 Review, Reviewer, February 2012
NIH/NIAID Reviewer, March 2012
NIH Career Development K Award Review Panel, October 2012
NIH/NHLBI, P01 Review, Reviewer, February 2013
BSC Site Visit Review Panel, NCI Radiation Biology Branch, May 20-21, 2013,
Bethesda, MD
NIH/NCI Omnibus R21, R15, R03 Review Panel April 2014.
NCI PO1-1 Review Panel, Bethesda MD, May 2014
NIH/NCI Tumor Cell Biology (TCB) Study Section (standing member) 2014-2019
NCI IMAT Program Review Panel, Bethesda Feb 24-25, 2015
NCI-F T32 study section (ad hoc reviewer) October 2016
NCI-F F30-32 study section (ad hoc reviewer) September 2017
NCI ZCA1 RTRB-C M2 R, Outstanding Investigator Award Study Section – 2015,
2017, 2020
NCI F training grant study section – 2019
NCI R21 Omnibus study section – 2019, 2020
NCI F K22 study section – 2020, 2021
NCI P01 study section – 2020
BSC Site Visit NHLBI Intermural Program Review – 2021

NCI/NIA Special Study section Aging and Cancer – 2021

(Review panels: Journals)

1. Free Radical Biology and Medicine
2. American Journal of Physiology
3. International Journal of Hyperthermia
4. Cancer Research
5. Journal of Vascular Research
6. Clinical Chemistry
7. Mutation Research
8. International Journal of Radiation Biology
9. Toxicology Letters
10. Archives of Biochemistry and Biophysics
11. Biochemistry
12. Biochemical Pharmacology
13. Life Sciences
14. FEBS Letters
15. Radiation Research
16. Oncogene
17. Journal of Cellular Physiology
18. Drug Metabolism and Disposition
19. Molecular and Cellular Biology
20. Biochimica et Biophysica Acta
21. Proc. Natl. Acad. Sci., USA
22. FASEB J.
23. Free Radical Research
24. Circulation Research
25. J. Biol. Chem.
26. Chemico-Biological Interactions
27. Eur. J. Biochem.
28. J. Physiol.
29. Neoplasia
30. Environmental and Molecular Mutagenesis
31. Mutagenesis
32. Molecular and Cellular Biochemistry
33. Toxicology and Applied Pharmacology
34. Molecular Cancer Research
35. Clinical Cancer Research
36. Cancer Cell

(Departmental, collegiate or university committees)

1. Roy J. and Lucille A. Carver College of Medicine Research Committee, U of Iowa, Member 2001-2004, Chairman and Co-Chairman 2004-2017
2. ESR Research Core Facility Advisory Committee, U of Iowa, 2001-2005

3. Interviewer for Medical Student and MSTP Admission Committee, U of Iowa, 2002
4. Member Medical School Admissions Committee, U of Iowa, 2003-2004
5. Radiation Oncology Executive Committee 2008-present
6. Holden Comprehensive Cancer Center Executive Committee 2008-present
7. COM Research Committee 2003-2018
8. Cancer Biology Training Consortium (CABTRAC) Board of Directors/Program Committee 2011-present

(Departmental, collegiate or university service positions)

1. Antioxidant Enzyme Core Laboratory Director, U of Iowa, 2004-present
2. Ionizing Radiation Core Facility Co-Director, U of Iowa, 2004-2008
3. Director, Radiation and Free Radical Research Core in the Holden Comprehensive Cancer Center and Carver COM, 2008-present
4. Director, Free Radical Metabolism and Imaging Program in the Holden Comprehensive Cancer Center, 2008-present
5. Medical Student Research Council, 2008-present

(Relevant community involvement)

Families with Children from China – member (1996-2015)

MWA Parent Support Group – member (2011-2015)