

# Benjamin J. Moeller, M.D., Ph.D.

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## Education

### Undergraduate / Bachelor of Science

Massachusetts Institute of Technology, Cambridge, Massachusetts, 9/1995-6/1999  
B.S., Biology and Philosophy,

### Medical School

Duke University School of Medicine, Durham, North Carolina, 8/1999-5/2006  
M.D., Ph.D., Department of Pathology,

### Residency

M. D. Anderson Cancer Center, Houston, Texas, 7/2007-6/2011  
Residency in Radiation Oncology,

### Leadership and Service Experience

Resident representative, Residency Selection Committee, 2010  
Resident representative, Residency Physics Curriculum Committee, 2009-2011  
Coordinator of rotation schedules, call schedules, and clinical review curriculum, 2008-2011

## Work history

### Internships

The University of Texas, Houston, Houston, Texas, 7/2006-6/2007  
Internship, Department of Medicine,

## Honors and Awards



Trainee of the Quarter, M. D. Anderson Cancer Center	2009
Fletcher Award for Outstanding Resident Research, M. D. Anderson Cancer Center	2009
AAAS/Science Program for Excellence in Science nomination	2005
American Cancer Society Institutional Student Research Fellowship	2004
Radiation Research Society Jack Fowler Professorship Award	2004
Howard Hughes Medical Institute Research Fellowship	2001-2002

## Research, Publications, & Teaching

### Publications

1. Usami S, Abe S, Kasai M, Shinkawa H, Moeller B, Kenyon JB, Kimberling WJ. Genetic and clinical features of sensorineural hearing loss associated with the 1555 mitochondrial mutation. *Laryngoscope*. 107(4):483-90, 1997.
2. Jackson-Grusby L, Laird PW, Magge SN, Moeller BJ, Jaenisch R. Mutagenicity of 5-aza-2'-deoxycytidine is mediated by the mammalian DNA methyltransferase. *Proc Natl Acad Sci U SA*. 94(9):4681-5, 1997.
3. Possemato R, Eggen K, Moeller BJ, Jaenisch R, Jackson-Grusby L. Flp recombinase regulated lacZ expression at the ROSA26 locus. *Genesis*. 32(2):184-6, 2002.
4. Dewhirst MW, Shan S, Cao Y, Moeller B, Yuan F, Li CY. Intravital fluorescence facilitates measurement of multiple physiologic functions and gene expression in tumors of live animals. *Dis Markers*. 18(5-6):293-311, 2002.
5. Nair S, Boczkowski D, Moeller B, Dewhirst M, Vieweg J, Gilboa E. Synergy between tumor immunotherapy and antiangiogenic therapy. *Blood*. 102(3):964-71, 2003.
6. Moeller BJ, Cao Y, Li CY, Dewhirst MW. Radiation activates HIF-1 to regulate vascular radiosensitivity in tumors: role of reoxygenation, free radicals, and stress granules. *Cancer Cell*. 5(5):429-41, 2004.
7. Moeller BJ, Dewhirst MW. Raising the bar: how HIF-1 helps determine tumor radiosensitivity. *Cell Cycle* 3(9):1107-10, 2004.
8. Moeller BJ, Cao Y, Vujaskovic Z, Li CY, Haroon Z, Dewhirst MW. The relationship between hypoxia and angiogenesis. *Seminars in Radiation Oncology* 14(3): 215-21, 2004.
9. Sorg BS, Moeller BJ, Donovan O, Cao Y, Dewhirst MW. Hyperspectral imaging of hemoglobin saturation in tumor microvasculature and tumor hypoxia development. *J Biomed Opt*. 10(4):44004, 2005.
10. Moeller BJ, Dreher MR, Schroeder T, Rabbani ZN, Cao Y, Dewhirst MW. Pleiotropic effects of tumor

HIF-1 blockade on radiotherapeutic sensitivity. *Cancer Cell*. 8(2):99-110, 2005.

11. Moeller BJ, Batinic-Haberle I, Spasojevic I, Rabbani ZN, Anscher MS, Vujaskovic Z, Dewhirst MW. A manganese porphyrin Superoxide Dismutase mimetic enhances tumor radioresponsiveness. *International Journal of Radiation Oncology Biology Physics*. 63(2):545-52, 2005.
12. Hart JP, Broadwaterm SG, Rabbani ZN, Moeller BJ, Clough R, Huang D, Sempowski GA, Dewhirst M, Pizzo SV, Vujaskovic Z, Anscher MS. Cytokine profiling for prediction of symptomatic radiation-induced lung injury. *International Journal of Radiation Oncology Biology Physics*. 63(5):1448-54, 2005.
13. Cao Y, Li CY, Moeller BJ, Yu D, Zhao Y, Dreher MR, Shan S, Dewhirst MW. Observation of incipient tumor angiogenesis that is independent of hypoxia and hypoxia inducible factor-1 activation. *Cancer Research* 65(13):5498-505, 2005.
14. Kelly P, Moeller BJ, Juneja J, Booden MA, Der CJ, Daaka Y, Dewhirst MW, Fields TA, Casey PJ. The G12 family of heterotrimeric G proteins promotes breast cancer invasion and metastasis. *Proc Natl Acad Sci U S A*. 103(21):8173-8, 2006.
15. Moeller BJ, Dewhirst MW. HIF-1 and tumour radiosensitivity. *Br J Cancer* 95(1):1-5, 2006.
16. Moeller BJ, Richardson RA, Dewhirst MW. Hypoxia and radiotherapy: opportunities for improved outcomes in cancer treatment. *Cancer Metastasis Rev*. 26(2):241-8, 2007.
17. Gridley DS, Makinde AY, Luo X, Rizvi A, Crapo JD, Dewhirst MW, Moeller BJ, Pearlstein RD, Slater JM. Radiation and a metalloporphyrin radioprotectant in a mouse prostate tumor model. *Anticancer Res*. 27(5A):3101-9, 2007.
18. Zennadi R, Moeller BJ, Whalen EJ, Batchvarova M, Xu K, Shan S, Delahunty M, Dewhirst MW, Telen MJ. Epinephrine-induced activation of LW-mediated sickle cell adhesion and vasoocclusion in vivo. *Blood* 110(7):2708-17, 2007.
19. Dong M, How T, Kirkbride KC, Gordon KJ, Lee JD, Hempel N, Kelly P, Moeller BJ, Marks JR, Blobe GC. The type III TGF-beta receptor suppresses breast cancer progression. *J Clin Invest*. 117(1):206-17, 2007.
20. Sorg BS, Hardee ME, Agarwal N, Moeller BJ, Dewhirst MW. Spectral imaging facilitates visualization and measurements of unstable and abnormal microvascular oxygen transport in tumors. *J Biomed Opt*. 13(1):014026, 2008.
21. Gridley DS, Makinde AY, Luo X, Rizvi A, Crapo JD, Dewhirst MW, Moeller BJ, Pearlstein RD, Slater JM. Radiation and a metalloporphyrin radioprotectant in a mouse prostate tumor model. *Anticancer Res*. 27(5A):3101-9, 2008.
22. Sarraf-Yazdi S, Mi J, Moeller BJ, Niu X, White RR, Kontos CD, Sullenger BA, Dewhirst MW, Clary BM. Inhibition of in vivo tumor angiogenesis and growth via systemic delivery of an angiopoietin 2-specific RNA aptamer. *J Surg Res*. 146(1):16-23, 2008.
23. Dewhirst MW, Cao Y, Moeller BJ. Cycling hypoxia and free radicals regulate angiogenesis and radiotherapy response. *Nat Rev Cancer* 8(6):425-37, 2008.
24. Moeller BJ, Pasqualini R, Arap W. Ceramide-mediated apoptosis following ionizing radiation in

human prostate cancer cells: PKC $\alpha$  joins the fray. *Cancer Biol Ther* 8(1), 2009.

25. Moeller BJ, Pasqualini R, Arap W. Targeting cancer-specific synthetic lethality in doublestrand DNA break repair. *Cell Cycle* 8(12): 1872-6, 2009.

26. Moeller BJ, Rana V, Cannon BA, Williams MD, Sturgis EM, Ginsberg LE, Macapinlac HA, Lee JJ, Ang KK, Chao KS, Chronowski GM, Frank SJ, Morrison WH, Rosenthal DI, Weber RS, Garden AS, Schwartz DL. Prospective risk-adjusted [18F]Fluorodeoxyglucose positron emission tomography and computed tomography assessment of radiation response in head and neck cancer. *J Clin Oncol.* 27(15): 2509-15, 2009.

27. Rabbani ZN, Spasojevic I, Zhang X, Moeller BJ, Haberle S, Vasquez-Vivar J, Dewhirst MW, Vujaskovic Z, Batinic-Haberle I. Antiangiogenic action of redox-modulating Mn(III) mesotetakis(N-ethylpyridinium-2-yl)porphyrin, MnTE-2-PyP(5+), via suppression of oxidative stress in a mouse model of breast tumor. *Free Radic Biol Med.* 47(7): 992-1004, 2009.

28. Moeller BJ, Rana V, Cannon BA, Williams MD, Sturgis EM, Ginsberg LE, Macapinlac HA, Lee JJ, Ang KK, Chao KS, Chronowski GM, Frank SJ, Morrison WH, Rosenthal DI, Weber RS, Garden AS, Lippman SM, Schwartz DL. Prospective imaging assessment of mortality risk following head and neck radiotherapy. *International Journal of Radiation Oncology Biology Physics.* 78(3):667-74, 2010.

29. Pasqualini R, Moeller BJ, Arap W. Leveraging molecular heterogeneity of the vascular endothelium for targeted drug delivery and imaging. *Sem Thromb Hemo.* 36(3):343-51, 2010.

30. Moeller BJ, Arap W, Pasqualini R. Targeting synthetic lethality in DNA damage repair pathways as an anti-cancer strategy. *Curr Drug Targets.* 11(10):1336-40, 2010.

31. Staquicini FI, Moeller BJ, Arap W, Pasqualini R. Combinatorial vascular targeting in translational medicine. *Proteomics Clin Appl.* 4(6-7):626-32, 2010.

32. Moeller BJ, Sidman RL, Pasqualini R, Arap W. Discovery of DNA repair inhibitors by combinatorial library profiling. *Cancer Res.* 71(5):1816-24, 2011.

33. Moeller BJ, Yordy JS, Williams MD, Giri U, Raju U, Molkentine DP, Byers LA, Heymach JV, Story MD, Lee JJ, Sturgis EM, Weber RS, Garden AS, Ang KK, Schwartz DL. DNA repair biomarker profiling of head and neck cancer: Ku80 expression predicts locoregional failure and death following radiotherapy. *Clin Cancer Res.* 17(7):2035-43, 2011.

34. Moeller BJ, Chintagumpala M, Philip JJ, Grosshans DR, McAleer MF, Woo SY, Gidley PW, Vats TS, Mahajan A. Low early ototoxicity rates for pediatric medulloblastoma patients treated with proton radiotherapy. *Radiat Oncol.* 6:58, 2011.

## **Presentations**

1. Moeller BJ, Dreher MR, Schroeder T, Rabbani ZN, Cao Y, Dewhirst MW. Pleiotropic effects of HIF-1 blockade on tumor radiosensitivity. *Radiation Research Society*, 2005.

2. Moeller BJ, Cao Y, Li CY, Dewhirst MW. The role of free radicals and stress granules in radiation-induced HIF-1 activation. *American Society for Therapeutic Radiology and Oncology*, 2003.

3. Moeller BJ, Batinic-Haberle I, Spasojevic I, Rabbani ZN, Anscher MS, Vujaskovic Z, Dewhirst MW. A

Superoxide Dismutase mimetic inhibits tumor growth and vascularity. Tumor Microenvironment Workshop, 2003.

4. Moeller BJ and Dewhirst MW. Developing new targets: lessons learned from HIF-1. Invited talk. International Congress of Radiation Research, 2007.

5. Moeller BJ, Rana V, Cannon BA, Williams MD, Sturgis EM, Ginsberg LE, Macapinlac HA, Lee JJ, Ang KK, Chao KS, Chronowski GM, Frank SJ, Morrison WH, Rosenthal DI, Weber RS, Garden AS, Schwartz DL. FDG-PET/CT Imaging Does Not Impact Post-Radiation Response Assessment For Advanced Head And Neck Cancer. 7th International Conference on Head and Neck Cancer, 2008.

6. Moeller BJ, Rana V, Cannon BA, Williams MD, Sturgis EM, Ginsberg LE, Macapinlac HA, Lee JJ, Ang KK, Chao KS, Chronowski GM, Frank SJ, Morrison WH, Rosenthal DI, Weber RS, Garden AS, Schwartz DL. Does FDG-PET/CT Provide Added Value Over CT Alone for Assessment of Radiation Response in Advanced Stage Head and Neck Cancer? American Society for Therapeutic Radiology and Oncology, 2008.

7. Moeller BJ, Cannon BA, Ang KK, Ginsberg LE, Macapinlac HA, Garden AS, Morrison WH, Rosenthal DI, Schwartz DL. Correlating Survival with Radiographic Response to Radiotherapy for Head-and-Neck Cancer Patients: FDG-PET/CT is not Superior to CT Alone. American Society for Therapeutic Radiology and Oncology, 2009.

8. Moeller BJ, Chintagumpala M, Philip JJ, Woo SY, Wolff JE, Mahajan A. Proton Radiotherapy for Pediatric Medulloblastoma: Improved Early Ototoxicity. American Society for Therapeutic Radiology and Oncology, 2010.

## Miscellaneous

Editorial boards:

Reviewer, International Journal of Radiation Oncology Biology Physics, 2008-present

Reviewer, Cancer Research, 2008-present