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Radiation

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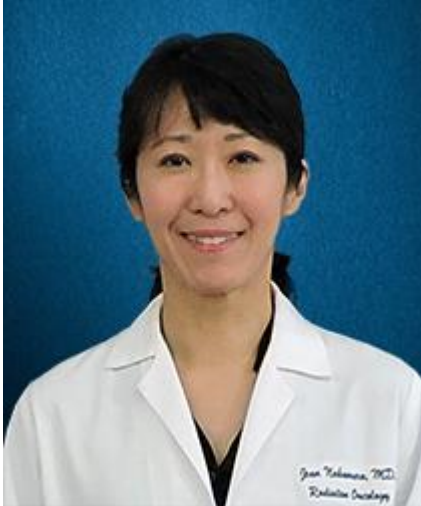
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Jean Nakamura

Jean L. Nakamura, M.D.

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Research Website ^[1]

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Professional Focus

Dr. Nakamura is a radiation oncologist whose clinical practice focuses on the management of tumors involving the brain and spinal cord. She is an experienced practitioner of radiosurgery in multiple modalities and practices at the Parnassus Medical Center of UCSF.

Dr. Nakamura is also a physician-scientist and leads a multi-disciplinary research team focused on cancer biology, cancer genetics and therapy (see General Overview below).

Dr. Nakamura is a recognized expert in radiation-induced malignancies and an investigator in an innovative Specialized Programs of Research Excellence (SPORE) program of the National Cancer Institute (NCI) known as the Developmental and HyperActive Ras Tumor (DHART) SPORE. The DHART SPORE is a five-year, \$10 million dollar research endeavor dedicated to pediatric cancer and is the first of its kind. The DHART SPORE is a highly collaborative, multi-disciplinary effort that involves multiple outstanding physicians and research investigators from academic institutions around the United States. Dr. Nakamura is

co-leading a major project to genetically dissect therapy-induced malignancies from pediatric cancer survivors and develop experimental models to study these malignancies. Her laboratory is analyzing cancers submitted from around the country in order to identify the fundamental genetic alterations in these malignancies.

General Research Overview

We are fundamentally interested in why cancers develop, and we believe that learning about the roots of cancer development will lead to better cancer therapies, more cures and even cancer prevention. We've chosen to focus on different but related problems in cancer medicine.

The first area we study is Neurofibromatosis I (also known as NF1), which is a genetic syndrome that can lead to tumors in children. Individuals with NF1 can develop brain tumors and tumors along their spines (as well as cancers in other organs). This is an incurable disease that can lead to many complications and even death. We have developed experimental systems (please enter Research Website Access, go to Research tab) to study how mutations causing this disease actually lead to tumor formation, with the goal of using this information to develop better therapies.

A second major area of research is trying to understand why second cancers develop in some childhood cancer survivors. Children who survive cancer unfortunately have a much greater risk of developing a second cancer, which in many cases is a devastating development. Currently there is little that can be done to prevent this. My research focuses on analyzing these second cancers from childhood cancer survivors (some of whom are now adults) for problems in the genetic code. By studying the abnormalities in the genetic code of second cancers, we expect to understand the biological processes leading to second cancers, and one day prevent these complications so that survivors of pediatric cancers have the best chance possible of living healthy adult lives. Some of the tools and approaches we've developed are described in more detail in our Research Website (click on Research Website Access).

While our studies focus on issues that affect children, these disease processes also affect adults. In fact, the biology we study is fundamental to cancer and is relevant to cancers in adults. Working with multiple outstanding collaborators is enabling research into diverse cancers.

Education

1993	University of Chicago	AB	Biology
1998	University of Chicago	MD	Pritzker School of Medicine
1998-1999	University of Chicago	Internship	Department of Internal Medicine
1999-2003	UCSF	Resident	Radiation Oncology
01/03 - 04/03	UCSF	Chief Resident	Radiation Oncology
2001-2002	UCSF	Research Fellow	Comprehensive Cancer Center

Professional Experience

2018-present	UCSF	Director of Faculty Mentoring,	Radiation Oncology
2018-present	UCSF	Vice-Chair, Radiation Safety Committee	Radiation Oncology
2013-present	UCSF	Associate Professor in Residence	Radiation Oncology
2007-2013	UCSF	Assistant Professor in Residence	Radiation Oncology
2005-2007	UCSF	Adjunct Professor	Radiation Oncology
2003-2005	UCSF	Clinical Instructor	Radiation Oncology

Awards & Honors

1990	Illinois State Scholar
1990	National Merit Scholarship
1992	University of Chicago, Richter Fund Grant for Undergraduate Research
1993	Graduated with General Honors from The University of Chicago College in the Biological Sciences
1995	Student Summer Research Award, University of Chicago, Pritzker School of Medicine
1998	Catherine Dobson Prize for Best Oral Presentation given at 52nd Annual Senior Scientific Session by a Non-PhD Student in the Area of Clinical Investigation Research done in Medical School
1998	University of Chicago Departmental Award for Outstanding Performance in the General Field of Radiation Oncology
2001	Radiological Society of North America Roentgen Award for Resident Research
2002	Radiological Society of North America Roentgen Award for Resident Research
2004	American Society for Therapeutic Radiology and Oncology Basic Science Travel Grant to the 46th Annual Meeting in Atlanta, GA
2005	National Institutes of Health Clinical Research Loan Repayment Award
2005	Kaiser Teaching Award Nomination
2008	Irene Holmes Perstein Award, UCSF
2012	St. Baldrick's Foundation Scholar Award

Recent Significant Publications :

B.J. Thibodeau, V. Lavergne, N. Dekhne, P. Benitez, M. Amin, S.Ahmed, J.L. Nakamura, P.R. Davidson, A.O. Nakamura, I.S. Grills, P.Y. Chen, J. Wobb, G.D. Wilson. **Mutational landscape of radiation-associated angiosarcoma of the breast.**

Oncotarget. 2018 Jan 19;9(11): 10042-10053. PMID: 29515789.

J. Ohja, A.J. deSmith, S. Gonseth, M. Zhou, H.M. Hansen, A. Sherborne, J. Nakamura, P.M. Bracci, K.M. Walsh, S.C. Finch, R.F. Reiss, M. Little, I. Dyagil, N. Gudzenko, D. Bazyka, J.L. Wiemels, L. Zablotska. **Genetic characterization of somatic alterations in radiation-associated chronic lymphocytic leukemia.** Environmental Health 2018 May 2;17(1):43. PMID: 29720177

B.A. Mendelsohn, M. Darch, N.K. Bennett, K. Yu, D. Pucciarelli, M. Horlbeck, L. Gilbert, W. Hyun, J.S. Weissman, M. Kampmann, J.L. Nakamura, K. Nakamura. **Systematic Metabolic Reprogramming reveals mechanisms of energy failure and therapy.** In press at PLOS Biology.

J. Chiu, S. Braunstein, J. Nakamura, P. Theodosopoulos, P. Sneed, M. McDermott, L. Ma. **A robustness check procedure for hypofractionated gamma knife radiosurgery.** In Press at Journal of Neurosurgery.

A.L. Sherborne, P.R. Davidson, K. Yu, A.O. Nakamura, M. Rashid, J.L. Nakamura. **Mutational analysis of ionizing radiation-induced neoplasms.** Cell Rep. 2015 Sep 22;12(11):1915-26. doi: 10.1016/j.celrep.2015.08.015. Epub 2015 Sep 3. PMID: 26344771.

R. Mroue, B. Huang, S. Braunstein, A. Firestone, J.L. Nakamura. **Loss of the imprinted gene Grb10 cooperates with Nf1 loss to promote tumorigenesis..** Provisionally accepted by PLOS Genetics in April 2015

N. Li, D.J. Maly, Y.H. Chanthery, D. Sirkis, C.S. Hackett, J.L. Nakamura, M.S. Berger, C.D. James, K.M. Shokat, W.A. Weiss, A.I. Persson. **A sequential regimen of radiotherapy followed by aurora kinase inhibition targets tumor-propagating cells in human glioblastoma..** Molecular Cancer Therapeutics. 2015 Feb; 14(2); 419-28. PMID: 25522764

S.D. Fouse, J.L. Nakamura, C.D. James, S. Chang, J.F. Costello. **Sensitivity of primary glioblastoma cells to therapy is patient-specific and independent of the stem cell phenotype..** Neuro-Oncology. 2014 Mar;16(3):361-71. PMID: 24311636.

S.E. Braunstein, J.L. Nakamura. **Radiotherapy-induced malignancies: Review of epidemiology, pathobiology and evolving technical approaches for mitigating risk..** Frontiers in Oncology. 2013;3:73. PMID: 23565507

M. Wahl, A. Hwang, J. Nakamura, I. Barani, S. Fogh, P. Sneed, M. McDermott, A. Sahgal, L. Ma. **Individual Beam Sharpening Improves Composite Dose Fall-off Near a Target for Non-isocentric Cyberknife Radiosurgery..** Technol Cancer Res Treat 2013 Aug;12(4):341-8. PMID: 23369157

Fogh S, Ma L, Gupta N, Sahgal A, Nakamura JL, Barani I, Sneed PK, McDermott M, Larson DA. **High-precision volume-staged Gamma Knife surgery and equivalent hypofractionation dose schedules for treating large arteriovenous malformations..** J Neurosurgery 2012 Dec; 117 Suppl: 115-9. PMID: 23205798

F L. Ma, S. Fogh, N. Gupta, A. Hwang, D. Pinnaduwege, J. Nakamura, I. Barani, M. McDermott, P. K. Sneed, D. Larson and A. Sahgal. **A technique for achieving submillimeter accuracy of volume-staged stereotactic radiosurgery..** Journal of Radiosurgery and SBRT. 2012; 2(1):11-17.

G. Choi, B. Huang, E. Pinarbasi, S.E. Braunstein, A.E. Horvai, S. Kogan, S. Bhatia, B. Faddegon, J.L. Nakamura. **Genetically mediated Nf1 loss in mice promotes diverse radiation-induced tumors modeling second malignant neoplasms.** Cancer Res. 2012 Dec 15;72(24):6425-34.PMID: 23071067

Caballero JA, Sneed PK, Lamborn KR, Ma L, Denduluri S, Nakamura JL, Barani IJ, McDermott MW. **Prognostic factors for survival in patients treated with stereotactic radiosurgery for recurrent brain metastases after prior whole brain radiotherapy.**Int J Radiat Oncol Biol Phys. 2012 May 1;83(1):303-9.PMID: 22079723

Ma L, Lee L, Barani I, Hwang A, Fogh S, Nakamura J, McDermott M, Sneed P, Larson DA, Sahgal A. **Shot sequencing based on biological equivalent dose considerations for multiple isocenter Gamma Knife radiosurgery.** Phys Med Biol. 2011 Nov 21;56(22):7247-56.PMID: 22037677

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