TODD AGUILERA, M.D., Ph.D.

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Current Position

Assistant Professor, Department or Radiation Oncology UT-Southwestern, Dallas, TX	6/2017-current

Education

Bachelor of Science- Biology Minor- Spanish, Philosophy, and Chemistry University of Portland- Portland, OR	8/1999-5/4/2003
Doctorate of Philosophy Roger Tsien Laboratory, Biomedical Sciences University of California- San Diego, CA	6/2005-9/5/2009
Doctor of Medicine School of Medicine University of California- San Diego, CA	8/2003-6/5/2011

Postdoctoral Training

Postdoctoral Fellow Roger Tsien Laboratory University of California- San Diego, CA	6/2009-10/2009
Internal Medicine Internship Department of Medicine University of California- San Diego, CA	6/2011-6/2012
Radiation Oncology Residency Department of Radiation Oncology, Stanford University- Stanford, CA	7/2012-6/2016
Postdoctoral Fellow Amato Giaccia Laboratory, Department of Radiation Oncology Stanford University- Stanford, CA	7/2016-5/2017

Honors/Grants

Henry S. Kaplan Fellow, Stanford Radiation Oncology	7/2016-current
ASTRO Resident Seed Grant	7/2014-6/2015
Malcolm A. Bagshaw Visiting Professor Symposium Award, Best research presentation	1/2015
American Board of Radiology Holman Research Pathway	1/2014-6/2016

Publications

Peer-reviewed Publications

1. **Aguilera T.A.** and Giaccia A.J. Molecular Pathways: Oncologic pathways and their role in T-cell exclusion and immune evasion- A new role for the AXL receptor tyrosine kinase. *Clinical Cancer Research.* June (2017). doi: 10.1158/1078-0432.CCR-17-0189.

2. **Aguilera T.A.**, Rafat M., Castellini L., Shehade H., Kariolis M.S., Bik-Yu Hui A., Stehr H., von Eyben R., Jiang D., Ellies L.G., Koong A.C., Diehn M., Rankin E.B., Graves E.E., Giaccia A.J. Reprogramming the immunological microenvironment through radiation and targeting Axl. Nature Communications. Dec 23; 7:13898 (2016). doi: 10.1038/mcomms13898.

3. Johnson R.W., Finger E.C, Olcina M.M., Vilalta M., **Aguilera T.A.**, Miao Y., Merkel A.R., Johnson J.R., Sterling J.A., Wu J.Y., Giaccia A.J. Induction of LIFR confers a dormancy phenotype in breast cancer cells disseminated to the bone marrow. Nature Cell Biology, Sep 19; 18(10):1078-1089 (2016). doi: 10.1038/ncb3408.

4. Cirujeda P., Cid Y.D., Muller H., Rubin D., **Aguilera T.A.**, Loo B.W., Diehn M., Binefa X., Depeursinge A. A 3D Riesz-Covariance texture model for prediction of nodule recurrence in lung CT. Transactions on Medical Imaging. Jul (2016). doi: 10.1109/TMI.2016.2591921.

5. Wu J., **Aguilera T.A.**, Shultz D.B., Gudur M., Rubin D.L., Loo B.W., Li R. Early Stage Non-small Cell Lung Cancer: Quantitative Imaging Characteristics of (18)F Fluorodeoxyglucose PET/CT Allow Prediction of Distant Metastasis. Radiology, Oct; 281(1): 270-8 (2016). doi: 10.1148/radiol.2016151829

6. Cirujeda P., Muller H., Rubin D., **Aguilera T.A.**, Loo B.W., Diehn M., Binefa X., Depeursinge A. 3D Riesz-wavelet based Covariance descriptors for texture classification of lung nodule tissue in CT. IEEE Eng Med Biol Soc, Aug; 7909-12 (2015). doi: 10.1109/EMBC.2015.7320226.

7. **Aguilera T.A.**, Giaccia A.J. The end of the hypoxic EPOch. Int J Radiat Oncol Biol Phys, Apr 1; 91(5): 895-7 (2015). doi: 10.1016/j.ijrobp.2015.01.041.

8. Olson E.S., Whitney M.A., Friedman B., **Aguilera T.A.**, Crisp J.L., Baik F.M., Jiang T., Baird S.M., Tsimikas S., Tsien R.Y., Nguyen Q.T. In vivo fluorescence imaging of atherosclerotic plaques with activatable cell-penetrating peptides targeting thrombin activity. *Integrative Biology*, Jun; 4(6): 595-605 (2012). doi: 10.1039/c2ib00161f

9. Ting R., **Aguilera T.A.**, Crisp J.L., Hall D.J., Eckelman W.C., Vera D.R., Tsien R.Y. Fast ^{18}F labeling of near-IR fluorophore enables PET/optical imaging of sentinel lymph nodes. *Bioconjugate Chemistry*, Oct 20; 21(10):1811-9 (2010). doi: 10.1021/bc1001328.

10. Whitney M., Crisp J.L., Olson E.S., **Aguilera T.A.**, Gross L.A., Ellies L.G., Tsien R.Y. Parallel in vivo and in vitro selection using phage display identifies protease-dependent tumor-targeting peptides. *J of Biological Chemistry.* Jul 16*;* 285(29): 22532-41 (2010). doi: 10.1074/jbc.M110.138297.

11. Nguyen Q.T., Olson E.S., **Aguilera T.A.**, Jiang T., Scadeng M., Ellies L.G., Tsien R.Y. Surgery with molecular fluorescence imaging using activatable cell-penetrating peptides decreases residual cancer and improves survival. *PNAS.* Mar 2; 107(9): 4317-22 (2010). doi: 10.1073/pnas.0910261107.

12. Olson E.S., Jiang T., **Aguilera T.A.**, Nguyen Q.T., Ellies L.G., Scadeng M., Tsien R.Y. Activatable cell penetrating peptides linked to nanoparticles as dual probes for in vivo fluorescence and MR imaging of proteases. *PNAS.* Mar 2; 107(9): 4311-6 (2010). doi: 10.1073/pnas.0910283107.

13. Lin M.Z., McKeown M.R., Ng H.L., **Aguilera T.A.**, Shaner N.C., Campbell R.E., Adams S.R., Gross L.A., Ma W., Alber T., Tsien R.Y. Autofluorescent proteins with excitation in the optical window for intravital imaging in mammals. *Chemistry & Biology.* Nov 25; 16(11): 1169-79 (2009). doi: 10.1016/j.chembiol.2009.10.009.

14. **Aguilera T.A.***, Olson E.S.*, Timmers M.M., Jiang T., and Tsien R.Y. Systemic in vivo distribution of activatable cell penetrating peptides is superior to that of cell penetrating peptides. *Integrative Biology.* Jun; 1: 371-381 (2009). doi: 10.1039/b904878b.

15. Olson E.S.*, **Aguilera T.A.***, Jiang T., Ellies L.G., Nguyen Q.T., Wong E.H., Gross L.A., and Tsien R.Y. In vivo characterization of activatable cell penetrating peptiodes for targeting protease activity in cancer. *Integrative Biology* Jun; 1. 382-393 (2009). doi: 10.1039/b904890a.

16. Shu S, Royant A., Lin M.Z., **Aguilera T.A.**, Lev-Ram V., Steinbach P.A., Tsien R.Y. Mammalian Expression of Infrared Fluorescent Proteins Engineered from a Bacterial Phytochrome. *Science* 324: 804-807 (2009). doi: 10.1126/science.1168683.

*Equal contribution first author

Peer-reviewed Publications in preparation or in review:

1. **Aguilera T.A.**, Shehade H., Rafat M., Castellini L., Jiang D., Ellies L.G., Koong A.C., Rankin E.B., Graves E.E., Giaccia A.J. Immunologic heterogeneity impacts the immune microenvironment and sensitivity to radiation and immunotherapy. In preparation. Expected submission 8/2017.

2. Rafat M., **Aguilera T.A.**, Vilalta M., Bronsart L., von Eyben R., Golla M.A., Afghahi A., Jenkins M.J., Kurian A.W., Horst K.C., Giaccia A.J., Graves E.E. CD8+ T cells prevent local recurrence by circulating tumor cells following radiation therapy. In preparation. Expected submission 9/2017.

3. **Aguilera T.A.**, Luh T., von Eyben R., Maxim P.G., Le Q., Diehn M., Graves E.E., Loo B.W. Vertebral fractures after stereotactic ablative radiotherapy of lung tumors. In preparation. Expected submission 2017.

4. **Aguilera T.A.**, Starkov P., Golden D.I., Shultz D.B., Trakul N., Maxim P.G., Le Q., Loo B.W., Diehn M., Rubin D.L. The use of texture based radiomic CT analysis to predict outcomes in early-stage non-small cell lung cancer treated with stereotactic ablative radiotherapy. Under Review 7/2017.

Selected Oral Presentations:

1. **Aguilera T.A**., Rafat M., Kariolis M.S., von Eyben R., Graves E.E., Giaccia A.J. Targeting Immune Evasion in Cancer to Improve Radiation Sensitivity. ASTR, SITC, and NCI Immunotherapy Workshop, (June 2017). Oral Presentation.

2. **Aguilera T.A**., Rafat M., Kariolis M.S., von Eyben R., Graves E.E., Giaccia A.J. Tumor Immunologic Heterogeneity Influences Responses to Radiation and anti-PD-1 Immunotherapy. American Society for Radiation Oncology Annual Meeting, (October 2015). Oral Presentation.

3. **Aguilera T.A.**, Rafat M., Kariolis M.S., von Eyben R., Graves E.E., Giaccia A.J. Tumor Immunologic Heterogeneity Influences Response to Radiation and Immunotherapy. Tumor Microenvironment Workshop. Vancouver, Canada (August 2015). Oral Presentation.

4. **Aguilera T.A.**, Rafat M., Kariolis M.S., Graves E.E., Giaccia A.J. Tumor Heterogeneity Reveals Immune Resistance Limiting Efficacy of Combination Radiation and anti-PD-1 Immunotherapy. 2015 Stanford Department of Radiation Oncology Bagshaw Visiting Professor symposium. Stanford, California (January 2015). Oral Presentation.

5. **Aguilera T.A.**, Trakul N., Shultz D.B., Maxim P.G., Diehn M., Loo B.W. Vertebral Fractures after Stereotactic Ablative Radiotherapy of Lung Tumors.

American Society for Radiation Oncology Annual Meeting. San Francisco, California (Sept 2014). Oral Presentation.

6. **Aguilera T.A.**, Durkee B. CNS SBRT Case Discussions. Stanford SBRT Symposium (September 2014). Oral Presentation.

7. **Aguilera T.A.**, Shultz D.B., Nair V., Trakul N., West R., Loo B.W., Diehn M. SUVmax and GLUT-1 expression correlate with treatment failure in stage I lung adenocarcinoma. Radiological Society of North America. Chicago, Illinois (December 2013). Oral Presentation.

8. **Aguilera T.A.** Activatable Cell Penetrating Peptides in Clinical Contrast Agent and Therapeutic Development. Nobel Symposium- Tsien Lab Past, Present, and Future. San Diego, California (February 2009). Oral Presentation.

Selected Poster Presentations:

1. **Aguilera T.A.**, Rafat M., Casteellini L., Shehade H., Kariolis M.S., von Ebyen R., Graves E.E., Elleis L.G., Rankin E.B., Giaccia A.J. Axl tyrosine kinase is a key mediator of immunologic resistance after radiation therapy. Society for Immunotherapy of Cancer Annual Meeting. National Harbor, Maryland (November 2016). Poster Presentation.

2. **Aguilera T.A.**, Rafat M., Casteellini L., Kariolis M.S., vonEbyen R., Graves E.E., Giaccia A.J. Reprogramming the immunologic microenvironment through radiation and Axl targeting. AACR Annual Meeting. New Orleans, Louisiana (April 2016). Poster Presentation.

3. **Aguilera T.A.**, Rafat M., Kariolis M.S., Graves E.E., Giaccia A.J. Tumor immunologic heterogeneity influences response to radiation and combination immunotherapy. Society for Immunotherapy of Cancer Annual Meeting. National Harbor, Maryland (November 2015). Poster Presentation.

4. **Aguilera T.A.**, Rafat M., Kariolis M.S., Graves E.E., Giaccia A.J. Differential Radiosensitivity of Transgenic Breast Cancer Tumors is Associated with Anti-tumor Immune Responses. AACR State-of-the-Art Molecular Imaging in Cancer Biology and Therapy. San Diego, California (February 2015). Poster Presentation.

5. **Aguilera T.A.**, Rafat M., Kariolis M.S., Graves E.E., Giaccia A.J. Tumor Heterogeneity Reveals Immune Resistance Limiting Efficacy of Combination Radiation and anti-PD-1 Immunotherapy. AACR Radiation Oncology Think Tank Meeting. Fort Myers, Florida (January 2015). Poster Presentation.

6. **Aguilera T.A.**, Golden D., Shultz D.B., Trakul N., Maxim P.G., Rubin D., Loo B.L., and Diehn M. Novel imaging biomarkers in stage I non-small cell lung cancer treated with stereotactic ablative radiotherapy. American Society for Radiation Oncology Annual Meeting. Atlanta, Georgia (Sept 2013). Poster Presentation.

7. **Aguilera T.A.**, Crisp J.L., Jiang T., Wong E.H., Savariar E.N., Ellies L.G., Tsien R.Y. Activatable Cell Penetrating Peptides in Clinical Contrast Agent and Therapeutic Development. Imaging: Single Molecules to Whole Animals, Howard Hughes Medical Institute, Ashburn, Virginia (2009). Poster Presentation.

8. **Aguilera T.A.**, Olson E.S., Jiang T., Nguyen Q.T., Scadeng M., Ellies L.G., Tsien R.Y. Translation of Activatable Cell Penetrating Peptides for Use in Clinical Contrast Agent and Therapeutic Development. World Molecular Imaging Congress. Nice, France (2008). Poster Presentation.

9. **Aguilera T.A.**, Olson E.S., Jiang T., Whitney M., Tsimikas S., Tsien R.Y., Nguyen Q.T. Visualizing Atherosclerotic Plaques with Activatable Cell Penetrating Peptides. World Molecular Imaging Congress, Nice, France (2008). Poster Presentation.

10. **Aguilera T.A.**, Olson E.S., Jiang T., Nguyen Q.T., Scadeng M., Ellies L.G., Tsien R.Y. Protease Based Amplification for Clinical Contrast and Therapeutic Development using Activatable Cell Penetrating Peptides. Annual MD/PhD Student Conference, Keystone, Colorado (2008). Poster Presentation.

11. **Aguilera T.A.**, Olson E.S., Jiang T., Wong E.H., Nguyen Q.T., Scadeng M., Ellies L., Tsien R.Y. Imaging and Therapy with Activatable Cell Penetrating Peptides. American Association for Cancer Research. Chicago, Illinois (2006). Poster Presentation.

Patents

Peptides Whose Uptake by Cells is Controllable. Jiang T., Olson E.S., Whitney M., **Aguilera T.A.**, Nguyen Q., Wong E., Tsien R.Y. Publication number: WO2006125134 A1. Filing Date: May 19, 2006.

Receptor-based Antagonists of the Progreammed Death 1 (PD-1) Pathway. Giaccia A.j., Kariolis M.K., **Aguilera T.A.** Publication number: WO2016/164428 A1. Filing date: October 13, 2016.

Research Support

Aguilera, T.A. (PI) 08/2017-08/2021
Cancer Prevention Research Institute of Texas
First-Time, Tenure-Track Faculty Members Recruitment Award

Giaccia A.J. (PD) 07/01/16-05/23/17
NIH T32 postdoctoral training grant support (5T32CA121940-07)
Funded Post Doctoral Fellowship

Aguilera, T.A. (PI) 07/01/14–06/30/15
American Society for Radiation Oncology ASTRO
Resident Seed Grant
The Role of Radiation in Adaptive Immune Resistance and *de novo* Antitumor Immune Response.

Insel, P. (PD) 7/28/03-6/30/2011
NIH MSTP training grant (5T32GM007198-29/30/31/36A1)

Leadership, Teaching, and Educational Experience

AACR Radiation Oncology Think Tank, Fort Myers, FL 1/2015
Invited trainee

The Eight Comprehensive Cancer Research Training Program, Stanford University, Stanford, CA *9/2014*

Radiation Oncology Medical Student Lectures, Stanford University, Stanford, CA
Radiation Biology and Physics Lecture to medical students 2014
Gave monthly introductory lecture on radiation biology and physics to the medical students on the radiation oncology clerkship at Stanford.

Radiation Oncology Resident Core Curriculum, Stanford University, Stanford, CA
Core Radiation Oncology Lectures to the Department 2012-2015
2012: Management of Wilms Tumor and Management of Brain Metastasis
2013: Hypofractionation of Rectal Cancer and Management of Small Cell Lung Cancer
2014: Management of Oropharyngeal Carcinoma, Normal Tissue Tolerance in Radiotherapy of GI Cancers, Pediatric CNS Management and Treatment
2015: The Role of EGFR inhibition in Head and Neck Cancer an Evaluation of Panitumumab, Contouring of Gyn Malignancies, Contouring of Pancreas and Liver Malignancies

The Merrill J. Egorin Workshop in Cancer Therapeutics and Drug Development, Leesburg, VA 10/2013

Avelas Biosciences, San Diego, CA
Scientific Consultant 2009-2012

MSTP admissions committee, UCSD, San Diego, CA
Admissions committee student member 2006-2008

MSTP Undergraduate Research Fellowship program, UCSD, San Diego, CA
Teaching Assistant/Coordinator 2005-2006

Office of Student Representatives, UCSD School of Medicine, San Diego CA

School of Medicine Representative 2003-2006

Licenses and Certification

Drug Enforcement Administration Licensing # FA3488598	9/2012
License, Medical Board of California # A122650	8/2012
National Provider Identifier # 1487934774	8/2011

Professional Memberships

Society for Immunotherapy of Cancer	2015-current
American Society of Clinical Oncology	2013-current
American Association for Cancer Research	2013-current
American Society for Radiation Oncology	2011-current
Radiological Society of North America	2011-current