

Stanford



Monte Winslow

Associate Professor of Genetics and of Pathology

Bio

ACADEMIC APPOINTMENTS

- Associate Professor, Genetics
- Associate Professor, Pathology
- Member, Bio-X
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Stanford University Graduate Fellowship, Stanford University (2000-2004)
- Pre-Doctoral Fellowship, Howard Hughes Medical Institute (2001-2006)
- Hugh McDevitt Prize in Immunology, Stanford University (2006)
- Damon Runyon Cancer Research Foundation, Fellowship (2006-2009)
- Genentech Postdoctoral Fellowship, Massachusetts Institute of Technology (2009-2010)
- Scholar Award, Baxter Foundation (2011)
- Scholar Award, The V Foundation for Cancer Research (2012-2013)

PROFESSIONAL EDUCATION

- Ph.D., Stanford University , Immunology (2006)
- B.S., University of Victoria, Canada , Biochemistry and Microbiology (2000)

LINKS

- Winslow Lab Website: <http://winslowlab.stanford.edu/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Metastasis is a major clinical challenge driven by poorly understood cell state alterations. The goal of our lab is to use unbiased genomic methods and in vivo models to better understanding the molecular and cellular changes that underlie tumor progression and each step of the metastatic cascade. We use genetically-engineered mouse models of metastatic cancer in which the resulting tumors recapitulate the genetic alterations and histological progression of the human disease.

In these models, tumors develop within their appropriate microenvironment and undergo changes in their gene expression programs that endow them with the ability to invade blood and lymphatic vessels, survive in circulation, enter various distant organs, and ultimately grow into new tumor lesions. Given the dearth of human tissue samples from metastatic disease, especially from primary tumors and metastases from the same patient prior to therapy, these models represent a unique opportunity to understand the molecular biography of the most prevalent tumor types.

By generating activating and inactivating germline and inducible alleles, and modulating gene expression using lentiviral vectors, these models allow us to characterize the function of candidate genes and pathways during tumor progression and metastasis in vivo. By incorporating increasingly quantitative methods and powerful in vivo methods, our work is focused on uncovering general rules that govern tumor progression and metastatic spread and discovering novel therapeutic targets across the continuum of cancer progression including the lethal metastatic stage.

Teaching

COURSES

2020-21

- Advanced Genetics: GENE 205 (Win)

2019-20

- Advanced Genetics: GENE 205 (Win)
- Cellular and Clinical Aspects of Cancer: CBIO 242 (Spr)

2018-19

- Advanced Genetics: GENE 205 (Win)
- Biology and Applications of CRISPR/Cas9: Genome Editing and Epigenome Modifications: BIOS 268, GENE 268 (Spr)
- Cellular and Clinical Aspects of Cancer: CBIO 242 (Spr)

2017-18

- Advanced Genetics: GENE 205 (Win)
- Biology and Applications of CRISPR/Cas9: Genome Editing and Epigenome Modifications: BIOS 268 (Spr)
- Cellular and Clinical Aspects of Cancer: CBIO 242 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Brittany Flowers, Joel Francis, Dylan Husmann, Alyssa Kaiser, Julie Ko, Ian Linde, Maggie Martins, Kevin Nuno, Aparna Rajpurkar, Akshay Sanghi, Yan Ting Shue, Andrew Spencley

Postdoctoral Faculty Sponsor

Hongchen Cai, Jess Hebert, Saswati Karmakar, Wen-Yang (Ann) Lin, Rui Tang, Yuning Tang, Maryam Yousefi

Doctoral Dissertation Advisor (AC)

Emily Ashkin, Nicholas Hughes, Christopher Murray, Sarah Pierce

Doctoral Dissertation Co-Advisor (AC)

Emily Shuldiner

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (Phd Program)
- Genetics (Phd Program)

Publications

PUBLICATIONS

- **Zmat3 Is a Key Splicing Regulator in the p53 Tumor Suppression Program.** *Molecular cell*
Biegging-Rolett, K. T., Kaiser, A. M., Morgens, D. W., Boutelle, A. M., Seoane, J. A., Van Nostrand, E. L., Zhu, C., Houlihan, S. L., Mello, S. S., Yee, B. A., McClendon, J., Pierce, S. E., Winters, et al
2020; 80 (3): 452
- **A versatile system to record cell-cell interactions.** *eLife*
Tang, R., Murray, C. W., Linde, I. L., Kramer, N. J., Lyu, Z., Tsai, M. K., Chen, L. C., Cai, H., Gitler, A. D., Engleman, E., Lee, W., Winslow, M. M.
2020; 9
- **CRISPR screens in cancer spheroids identify 3D growth-specific vulnerabilities** *NATURE*
Han, K., Pierce, S. E., Li, A., Spees, K., Anderson, G. R., Seoane, J. A., Lo, Y., Dubreuil, M., Olivas, M., Kamber, R. A., Wainberg, M., Kostyrko, K., Kelly, et al
2020
- **Axon-like protrusions promote small cell lung cancer migration and metastasis.** *eLife*
Yang, D., Qu, F., Cai, H., Chuang, C., Lim, J. S., Jahchan, N., Gruner, B. M., S Kuo, C., Kong, C., Oudin, M. J., Winslow, M. M., Sage, J.
2019; 8
- **An Lkb1-Sik axis suppresses lung tumor growth and controls differentiation.** *Cancer discovery*
Murray, C. W., Brady, J. J., Tsai, M. K., Li, C., Winters, I. P., Tang, R., Andrejka, L., Ma, R. K., Kunder, C. A., Chu, P., Winslow, M. M.
2019
- **Towards quantitative and multiplexed in vivo functional cancer genomics.** *Nature reviews. Genetics*
Winters, I. P., Murray, C. W., Winslow, M. M.
2018
- **Intertumoral Heterogeneity in SCLC Is Influenced by the Cell Type of Origin.** *Cancer discovery*
Yang, D., Denny, S. K., Greenside, P. G., Chaikovsky, A. C., Brady, J. J., Ouadah, Y., Granja, J. M., Jahchan, N. S., Lim, J. S., Kwok, S., Kong, C. S., Berghoff, A. S., Schmitt, et al
2018
- **Hmga2 is dispensable for pancreatic cancer development, metastasis, and therapy resistance.** *Scientific reports*
Chiou, S., Dorsch, M., Kusch, E., Naranjo, S., Kozak, M. M., Koong, A. C., Winslow, M. M., Gruner, B. M.
2018; 8 (1): 14008
- **Tumor Suppressor Activity of Selenbp1, a Direct Nkx2-1 Target, in Lung Adenocarcinoma.** *Molecular cancer research : MCR*
Caswell, D. R., Chuang, C., Ma, R. K., Winters, I. P., Snyder, E. L., Winslow, M. M.
2018
- **Mapping the in vivo fitness landscape of lung adenocarcinoma tumor suppression in mice** *NATURE GENETICS*
Rogers, Z. N., McFarland, C. D., Winters, I. P., Seoane, J. A., Brady, J. J., Yoon, S., Curtis, C., Petrov, D. A., Winslow, M. M.
2018; 50 (4): 483-+
- **A quantitative and multiplexed approach to uncover the fitness landscape of tumor suppression in vivo.** *Nature methods*
Rogers, Z. N., McFarland, C. D., Winters, I. P., Naranjo, S., Chuang, C., Petrov, D., Winslow, M. M.
2017
- **Molecular definition of a metastatic lung cancer state reveals a targetable CD109-Janus kinase-Stat axis.** *Nature medicine*
Chuang, C., Greenside, P. G., Rogers, Z. N., Brady, J. J., Yang, D., Ma, R. K., Caswell, D. R., Chiou, S., Winters, A. F., Gruner, B. M., Ramaswami, G., Spencley, A. L., Kopecky, et al
2017; 23 (3): 291-300
- **Blimp1 induces transient metastatic heterogeneity in pancreatic cancer.** *Cancer discovery*
Chiou, S. H., Risca, V. I., Wang, G. X., Yang, D., Gruner, B. M., Kathiria, A. S., Ma, R. K., Vaka, D., Chu, P., Kozak, M., Castellini, L., Graves, E. E., Kim, et al
2017
- **Nfib Promotes Metastasis through a Widespread Increase in Chromatin Accessibility** *CELL*

- Denny, S. K., Yang, D., Chuang, C., Brady, J. J., Lim, J. S., Gruner, B. M., Chiou, S., Schep, A. N., Baral, J., Hamard, C., Antoine, M., Wislez, M., Kong, et al
2016; 166 (2): 328-342
- **CD47-blocking immunotherapies stimulate macrophage-mediated destruction of small-cell lung cancer** *JOURNAL OF CLINICAL INVESTIGATION*
Weiskopf, K., Jahchan, N. S., Schnorr, P. J., Cristea, S., Ring, A. M., Maute, R. L., Volkmer, A. K., Volkmer, J., Liu, J., Lim, J. S., Yang, D., Seitz, G., Thuyen Nguyen, et al
2016; 126 (7): 2610-2620
 - **An Arnt2-Driven Secretome Enables Lung Adenocarcinoma Metastatic Self-Sufficiency** *CANCER CELL*
Brady, J. J., Chuang, C., Greenside, P. G., Rogers, Z. N., Murray, C. W., Caswell, D. R., Hartmann, U., Connolly, A. J., Sweet-Cordero, E. A., Kundaje, A., Winslow, M. M.
2016; 29 (5): 697-710
 - **Recombinase-based conditional and reversible gene regulation via XTR alleles** *NATURE COMMUNICATIONS*
Robles-Oteiza, C., Taylor, S., Yates, T., Cicchini, M., Lauderback, B., Cashman, C. R., Burds, A. A., Winslow, M. M., Jacks, T., Feldser, D. M.
2015; 6
 - **Design of Protease Activated Optical Contrast Agents That Exploit a Latent Lysosomotropic Effect for Use in Fluorescence-Guided Surgery.** *ACS chemical biology*
Ofori, L. O., Withana, N. P., Prestwood, T. R., Verdoes, M., Brady, J. J., Winslow, M. M., Sorger, J., Bogoy, M.
2015; 10 (9): 1977-1988
 - **Let-7 Represses Carcinogenesis and a Stem Cell Phenotype in the Intestine via Regulation of Hmga2.** *PLoS genetics*
Madison, B. B., Jeganathan, A. N., Mizuno, R., Winslow, M. M., Castells, A., Cuatrecasas, M., Rustgi, A. K.
2015; 11 (8)
 - **Pancreatic cancer modeling using retrograde viral vector delivery and in vivo CRISPR/Cas9-mediated somatic genome editing** *GENES & DEVELOPMENT*
Chiou, S., Winters, I. P., Wang, J., Naranjo, S., Dudgeon, C., Tamburini, F. B., Brady, J. J., Yang, D., Gruener, B. M., Chuang, C., Caswell, D. R., Zeng, H., Chu, et al
2015; 29 (14): 1576-1585
 - **Upregulation of the microRNA cluster at the Dkl1-Dio3 locus in lung adenocarcinoma** *ONCOGENE*
Valdmanis, P. N., Roy-Chaudhuri, B., Kim, H. K., Sayles, L. C., Zheng, Y., Chuang, C., Caswell, D. R., Chu, K., Zhang, Y., Winslow, M. M., Sweet-Cordero, E. A., Kay, M. A.
2015; 34 (1): 94-103
 - **Pancreatic cancer modeling using retrograde viral vector delivery and in vivo CRISPR/Cas9-mediated somatic genome editing.** *Genes & development*
Chiou, S. H., Winters, I. P., Wang, J., Naranjo, S., Dudgeon, C., Tamburini, F. B., Brady, J. J., Yang, D., Gruner, B. M., Chuang, C. H., Caswell, D. R., Zeng, H., Chu, et al
2015; 29 (14): 1576-85
 - **An AMPK-Independent Signaling Pathway Downstream of the LKB1 Tumor Suppressor Controls Snail1 and Metastatic Potential.** *Molecular cell*
Goodwin, J. M., Svensson, R. U., Lou, H. J., Winslow, M. M., Turk, B. E., Shaw, R. J.
2014; 55 (3): 436-450
 - **Neurotrophin receptor TrkB promotes lung adenocarcinoma metastasis.** *Proceedings of the National Academy of Sciences of the United States of America*
Sinkevicius, K. W., Kriegel, C., Bellaria, K. J., Lee, J., Lau, A. N., Leeman, K. T., Zhou, P., Beede, A. M., Fillmore, C. M., Caswell, D., Barrios, J., Wong, K., Sholl, et al
2014; 111 (28): 10299-10304
 - **Obligate Progression Precedes Lung Adenocarcinoma Dissemination** *CANCER DISCOVERY*
Caswell, D. R., Chuang, C., Yang, D., Chiou, S., Cheemalavagu, S., Kim-Kiselak, C., Connolly, A., Winslow, M. M.
2014; 4 (7): 781-789
 - **A Conditional System to Specifically Link Disruption of Protein-Coding Function with Reporter Expression in Mice** *CELL REPORTS*
Chiou, S., Kim-Kiselak, C., Risca, V. I., Heimann, M. K., Chuang, C., Burds, A. A., Greenleaf, W. J., Jacks, T. E., Feldser, D. M., Winslow, M. M.
2014; 7 (6): 2078-2086
 - **A conditional system to specifically link disruption of protein-coding function with reporter expression in mice.** *Cell reports*
Chiou, S., Kim-Kiselak, C., Risca, V. I., Heimann, M. K., Chuang, C., Burds, A. A., Greenleaf, W. J., Jacks, T. E., Feldser, D. M., Winslow, M. M.
2014; 7 (6): 2078-2086

- **Obligate progression precedes lung adenocarcinoma dissemination.** *Cancer discovery*
Caswell, D. R., Chuang, C. H., Yang, D., Chiou, S. H., Cheemalavagu, S., Kim-Kiselak, C., Connolly, A., Winslow, M. M.
2014; 4 (7): 781–89
- **Differential Tks5 isoform expression contributes to metastatic invasion of lung adenocarcinoma** *GENES & DEVELOPMENT*
Li, C. M., Chen, G., Dayton, T. L., Kim-Kiselak, C., Hoersch, S., Whittaker, C. A., Bronson, R. T., Beer, D. G., Winslow, M. M., Jacks, T.
2013; 27 (14): 1557-1567
- **MicroRNA-33a Mediates the Regulation of High Mobility Group AT-Hook 2 Gene (HMGA2) by Thyroid Transcription Factor 1 (TTF-1/NKX2-1)** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Rice, S. J., Lai, S., Wood, L. W., Helsley, K. R., Runkle, E. A., Winslow, M. M., Mu, D.
2013; 288 (23): 16348-16360
- **Characterizing deformability and surface friction of cancer cells.** *Proceedings of the National Academy of Sciences of the United States of America*
Byun, S., Son, S., Amodei, D., Cermak, N., Shaw, J., Kang, J. H., Hecht, V. C., Winslow, M. M., Jacks, T., Mallick, P., Manalis, S. R.
2013; 110 (19): 7580-7585
- **A combinatorial extracellular matrix platform identifies cell-extracellular matrix interactions that correlate with metastasis** *NATURE COMMUNICATIONS*
Reticker-Flynn, N. E., Malta, D. F., Winslow, M. M., Lamar, J. M., Xu, M. J., Underhill, G. H., Hynes, R. O., Jacks, T. E., Bhatia, S. N.
2012; 3
- **Occludin Is a Direct Target of Thyroid Transcription Factor-1 (TTF-1/NKX2-1)** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Runkle, E. A., Rice, S. J., Qi, J., Masser, D., Antonetti, D. A., Winslow, M. M., Mu, D.
2012; 287 (34): 28790-28801
- **Treating metastatic cancer with nanotechnology** *NATURE REVIEWS CANCER*
Schroeder, A., Heller, D. A., Winslow, M. M., Dahlman, J. E., Pratt, G. W., Langer, R., Jacks, T., Anderson, D. G.
2012; 12 (1): 39-50
- **Response and Resistance to NF-kappa B Inhibitors in Mouse Models of Lung Adenocarcinoma** *CANCER DISCOVERY*
Xue, W., Meylan, E., Oliver, T. G., Feldser, D. M., Winslow, M. M., Bronson, R., Jacks, T.
2011; 1 (3): 236-247
- **Nuclear factor I/B is an oncogene in small cell lung cancer** *GENES & DEVELOPMENT*
Dooley, A. L., Winslow, M. M., Chiang, D. Y., Banerji, S., Stransky, N., Dayton, T. L., Snyder, E. L., Senna, S., Whittaker, C. A., Bronson, R. T., Crowley, D., Barretina, J., Garraway, et al
2011; 25 (14): 1470-1475
- **Suppression of lung adenocarcinoma progression by Nkx2-1** *NATURE*
Winslow, M. M., Dayton, T. L., Verhaak, R. G., Kim-Kiselak, C., Snyder, E. L., Feldser, D. M., Hubbard, D. D., DuPage, M. J., Whittaker, C. A., Hoersch, S., Yoon, S., Crowley, D., Bronson, et al
2011; 473 (7345): 101-U120
- **Endogenous T Cell Responses to Antigens Expressed in Lung Adenocarcinomas Delay Malignant Tumor Progression** *CANCER CELL*
DuPage, M., Cheung, A. F., Mazumdar, C., Winslow, M. M., Bronson, R., Schmidt, L. M., Crowley, D., Chen, J., Jacks, T.
2011; 19 (1): 72-85
- **Stage-specific sensitivity to p53 restoration during lung cancer progression** *NATURE*
Feldser, D. M., Kostova, K. K., Winslow, M. M., Taylor, S. E., Cashman, C., Whittaker, C. A., Sanchez-Rivera, F. J., Resnick, R., Bronson, R., Hemann, M. T., Jacks, T.
2010; 468 (7323): 572-U249
- **Selective role of calcineurin in haematopoiesis and lymphopoiesis** *EMBO REPORTS*
Gallo, E. M., Ho, L., Winslow, M. M., Staton, T. L., Crabtree, G. R.
2008; 9 (11): 1141-1148
- **Targeted deletion reveals essential and overlapping functions of the miR-17 similar to 92 family of miRNA clusters** *CELL*
Ventura, A., Young, A. G., Winslow, M. M., Lintault, L., Meissner, A., Erkeland, S. J., Newman, J., Bronson, R. T., Crowley, D., Stone, J. R., Jaenisch, R., Sharp, P. A., Jacks, et al

2008; 132 (5): 875-886

- **Calcineurin sets the bandwidth for discrimination of signals during thymocyte development** *NATURE*
Gallo, E. M., Winslow, M. M., Cante-Barrett, K., Radermacher, A. N., Ho, L., McGinnis, L., Iritani, B., Neilson, J. R., Crabtree, G. R.
2007; 450 (7170): 731-U11
- **Selective role of NFATc3 in positive selection of thymocytes** *JOURNAL OF IMMUNOLOGY*
Cante-Barrett, K., Winslow, M. M., Crabtree, G. R.
2007; 179 (1): 103-110
- **Stringent control of NFATc1 nuclear occupancy is critical for maintaining balanced immune response** *GENE THERAPY AND MOLECULAR BIOLOGY*
Pan, M., Winslow, M. M., Keum, J. S., Crabtree, G. R.
2007; 11B: 171-176
- **Calcineurin/NFAT signalling regulates pancreatic beta-cell growth and function** *NATURE*
Heit, J. J., Apelqvist, A. A., Gu, X., Winslow, M. M., Neilson, J. R., Crabtree, G. R., Kim, S. K.
2006; 443 (7109): 345-349
- **Calcineurin/NFAT signaling in osteoblasts regulates bone mass** *DEVELOPMENTAL CELL*
Winslow, M. M., Pan, M., Starbuck, M., Gallo, E. M., Deng, L., Karsenty, G., Crabtree, G. R.
2006; 10 (6): 771-782
- **NFAT dysregulation by increased dosage of DSCR1 and DYRK1A on chromosome 21** *NATURE*
Arron, J. R., Winslow, M. M., Polleri, A., Chang, C., Wu, H., Gao, X., Neilson, J. R., Chen, L., Heit, J. J., Kim, S. K., Yamasaki, N., Miyakawa, T., Francke, et al
2006; 441 (7093): 595-600
- **CD8(+) recent thymic emigrants home to and efficiently repopulate the small intestine epithelium** *NATURE IMMUNOLOGY*
Staton, T. L., Habtezion, A., Winslow, M. M., Sato, T., Love, P. E., Butcher, E. C.
2006; 7 (5): 482-488
- **The calcineurin phosphatase complex modulates immunogenic B cell responses** *IMMUNITY*
Winslow, M. M., Gallo, E. M., Neilson, J. R., Crabtree, G. R.
2006; 24 (2): 141-152
- **Calcineurin B1 is essential for positive but not negative selection during thymocyte development** *IMMUNITY*
Neilson, J. R., Winslow, M. M., Hur, E. M., Crabtree, G. R.
2004; 20 (3): 255-266