BIOGRAPHICAL SKETCH

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NAME: Sarah Weiss

eRA COMMONS USER NAME (credential, e.g., agency login): WEISSS09

POSITION TITLE: Associate Professor of Medicine (Medical Oncology), Rutgers Cancer Institute of NJ

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Rutgers University, New Brunswick, NJ	BA	05/2005	Biology & English
Albert Einstein College of Medicine, Bronx, NY	MD	06/2009	Medicine
Montefiore Medical Center, Bronx, NY	Resident	06/2012	Internal Medicine
NYU School of Medicine, New York, NY	Fellow	06/2015	Hematology/Oncology
NYU School of Medicine, New York, NY	Post-doc	06/2016	Melanoma research

A. Personal Statement

I am a medical oncologist and Associate Professor of Medicine at Rutgers Cancer Institute of New Jersey where I serve as the Director of the Melanoma/Cutaneous Oncology Program. My clinical practice focuses on the treatment of patients with high-risk and advanced melanoma and other cutaneous malignancies (merkel cell, basal cell, and squamous cell carcinomas) and includes enrollment of eligible patients on investigator-initiated and industry sponsored clinical trials. My research focus and my collaborations with clinical and translational investigators involves several areas including: addressing resistance to immune checkpoint inhibitors, management of melanoma brain metastases, and conducting studies to identify tissue and blood-based prognostic and predictive biomarkers in melanoma. I recently completed a 3-year K12 grant which provided me with protected time for research in which I focused on the study of macrophage-modulating drugs, including a CD40 agonist, to overcome resistance to anti-PD-1 which I evaluated in multiple clinical trials. My long-term research objectives are to 1) design and develop early phase immunotherapy clinical trials for patients with advanced melanoma and other immunogenic tumors and 2) to study and identify tissue and blood-based prognostic and predictive biomarkers that will drive rational patient selection for specific therapies.

B. Positions and Honors

Positions

2009-2010 Intern, Department of Medicine, Montefiore Medical Center, Bronx, NY

2010-2012 Resident, Department of Medicine, Montefiore Medical Center, Bronx, NY

2012-2015 Hematology/Oncology Fellow, Department of Medicine, NYU School of Medicine, New York, NY

2015-2016 Post-Doctoral Fellowship (Melanoma), NYU School of Medicine, New York, NY

2015-2016 Assistant-in-Service, NYU Langone Medical Center, New York, NY

2016-2021 Assistant Professor of Medicine (Medical Oncology), Yale University School of Medicine, New Haven, CT

2021-present Associate Professor of Medicine (Medical Oncology), Rutgers Cancer Institute of NJ, New Brunswick, NJ

2021-present Director, Melanoma/Cutaneous Oncology Program, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ

Honors

2004	Rutgers College Academic Excellence Award
2005	Oakley Vander Poel Award for exceptional proficiency in undergraduate studies in biology, Rutgers College, Rutgers University
2005	Summa cum laude, Rutgers College Honors Program, Rutgers University
2009	Albert Einstein College of Medicine Distinction in Oncology Research: Senior Thesis on "The Role of miR-23b Cluster in Breast Cancer Metastasis"
2012	Outstanding Resident Award in Internal Medicine, Montefiore Medical Center
2015	Recipient of Ruth L. Kirschstein National Research Service Award for Cutaneous Biology and Skin Diseases at NYU
2015	New York University Physician Scientist Training Program

Professional Societies

Member, American Society of Clinical Oncology
Member, Society for Immunotherapy of Cancer
Member, American Association for Cancer Research

Medical Licensure

New York (2012-2016)
Connecticut (2016-2021)
New Jersey (2021-present)

Board Certification

Internal Medicine (2012)
Hematology (2015)
Medical Oncology (2015)

C. Contributions to Science

1. **Anti-PD-1 Resistance:** Multiple lines of preclinical evidence generated by Yale and outside laboratories have identified that targeting tumor associated macrophages is one potential strategy to overcome anti-PD-1 resistance. I was the institutional PI on a trial of a CD40 agonist (Apexigen) and anti-PD-1 in patients with melanoma and NSCLC who developed resistance to anti-PD-1 and presented the findings at AACR in 2019. I am first author on the manuscript presenting the phase II melanoma data, which is currently under review for publication. Building off this experience with CD40 agonism, I wrote and was the co-PI of a phase I/Ib clinical trial to study whether targeting the innate immune system through combining macrophage-modulating drugs and anti-PD-1 can overcome anti-PD-1 resistance in melanoma, renal cell carcinoma and non-small cell lung cancer and was awarded a K12 grant for this project. The phase I portion of the trial is complete and published. The phase Ib trial data and correlates are under review for publication. I co-supervised the biospecimen collection for this trial and conducted correlative biomarker studies to identify predictors of response and resistance. I was also the co-PI on a second investigator-initiated trial using a CD40 agonist in the frontline setting in combination with ipilimumab and nivolumab in patients with treatment-naïve advanced melanoma or renal cell carcinoma, which is currently accruing at Yale. The investigator-initiated trials include:
   a) Investigator-Initiated Trial: A Phase I/Ib Study of APX005M in Combination with Nivolumab and Cabiralizumab in Patients with Advanced Melanoma, Non-small Cell Lung Cancer or Renal Cell Carcinoma Whose Disease Has Progressed on Anti-PD-1/PD-L1 Therapy (NCT03502330)
   b) Investigator-Initiated Trial: A Phase I Study of APX005M in Combination with Nivolumab and Ipilimumab in Treatment Naïve Patients with Advanced Melanoma or Renal Cell Carcinoma (NCT04495257)
   c) **Weiss SA**, Djureinovic D, Jessel S, Krykbaeva I, Zhang L, Jilaveanu L, Ralabate A, Johnson B, Shanwetter Levit N, Anderson G, Zelterman D, Wei W, Mahajan A, Trifan O, Bosenberg M, Kaech SM, Perry CJ, Damsky B, Gettinger S, Sznol M, Hurwitz M, Kluger H. A Phase I Study

of APX005M and Cabiralizumab with or without Nivolumab in Patients with Melanoma, Kidney Cancer, or Non-Small Cell Lung Cancer Resistant to Anti-PD-1/PD-L1. *Clin Cancer Res* Sep 1;27(17):4757-4767.

2. **Studies of Melanoma Brain Metastases:** I have studied features of patients with melanoma brain metastases that correlate with prognosis from multiple angles including germline, tumor, and image-based factors. I published a manuscript examining differences in immunologic and vascular profiles from a cohort of matched melanoma metastases from brain and extracranial sites. Moreover, I have been involved in investigator-initiated clinical trials of immune-based therapy for patients with brain metastases. I submitted an investigator-initiated clinical trial concept which was accepted by Merck's investigator studies program to study use of a VEGFR inhibitor in combination with anti-PD-1 in patients with brain metastases from melanoma and renal cell carcinoma who have progressed intracranially on anti-PD-1. This trial is currently accruing at Yale Cancer Center.

   a) **Weiss SA**, Han SW, Darvishian F, Wang J, Tadepalli J, Shapiro S, Golfinos J, Pavlick A, Polsky D, Kirchhoff T, Osman I. Somatic and germline analyses of a long-term melanoma survivor with a recurrent brain metastasis. *BMC Cancer* 2015, 15(926):1-6.
   b) B Bordia R, Zhong J, Lee J, **Weiss S**, Han SW, Osman I, Jain R. Melanoma Brain Metastases: Correlation of Imaging Features with Genomic Markers and Patient Survival. *J Neurooncol* 2016, 131(2):341-348.
   c) Annual Meeting, American Society of Clinical Oncology, Chicago, IL. Lui KP, Pires Silva I, **Weiss SA**, Han SW, Darvishian F, Pavlick AC, Golfinos J, Moogk D, Krogsgaard M, Osman I. "Immunologic profile of melanoma brain metastases in patients with prolonged survival." Poster presentation (abstract 9070).
   d) Kluger HM, Chiang V, Mahajan A, Zito CR, Sznol M, Tran T, **Weiss SA**, Cohen JV, Yu J, Hegde U, Perrotti E, Anderson G, Ralabate A, Kluger Y, Wei W, Goldberg SB, Jilaveanu LB. Long-term survival of patients with melanoma with active brain metastases treated with pembrolizumab on a phase II trial. *J Clin Oncol 2019*.
   e) **Weiss SA**, Zito C, Tran T, Heishima K, Neumeister V, McGuire J, Adeniran A, Kluger H, Jilaveanu LB. Melanoma brain metastases have lower T-cell content and microvessel density compared to matched extracranial metastases. *J Neurooncol* 2020.
   f) Tran T, Caulfield J, Zhang L, Schoenfeld D, Djureinovic D, Chiang V, Oria V, **Weiss SA**, Olino K, Jilaveanu LB, Kluger HM. Lenvatinib or anti-VEGF in combination with anti-PD-1 differentially augments antitumor activity in melanoma. *JCI Insight* 2023.

3.

4. **Prognostic Biomarkers:** I have led several studies investigating the value of tissue-based prognostic biomarkers in early stage cancers. I have examined the prognostic impact of tumor-infiltrating lymphocytes (TIL) in primary melanomas through a number of lenses including: 1) whether immunoregulatory gene expression signatures of each TIL grade can refine prognostic categories in melanoma; 2) the interplay between age and TIL status and the impact on prognosis in several large melanoma patient cohorts, and 3) age-mediated differences in intra-tumoral immune populations that may enhance response to anti-PD-1 therapies. In renal cell carcinoma, I reported that tumor microvessel density is an independent prognostic marker in a study of tumors resected from patients who received treatment with adjuvant sunitinib, sorafenib, or placebo on ECOG-ACRIN 2805. These investigations further inform our understanding of tissue-based features that place patients at highest risk for cancer recurrence.

   a) Kugel CH, Douglass SM, Webster MR, Kaur A, Liu Q, **Weiss S**, Darvishian F, Al-Rohil RN, Ndoye A, et al. Age-related differences in intratumoral Tregs dictate response to anti-PD-1. *Clin Cancer Res* 2018.
   b) **Weiss SA**, Han SW, Lui K, Tchack J, Shapiro R, Berman R, Zhong J, Krogsgaard M, Osman I, Darvishian F. Immunologic heterogeneity of tumor infiltrating lymphocyte composition in primary melanoma. *Hum Pathol* 2016, 57:116-125.
   c) **Weiss SA**, Han J, Darvishian F, Tchack J, Malecek K, Han SW, Krogsgaard M, Osman I, Zhong J. Impact of aging on the host immune response and survival in melanoma: an analysis of 3 patient cohorts. *J Transl Med* 2016, 14(299): 1-11.
   d) Jilaveanu LB*****, Puligandla M*****, **Weiss SA***, Wang VX, Zito CR, Flaherty KT, Boeke M, Neumeister VM, Camp RL, Adeniran A, Pins M, Manola J, DiPaola RS, Haas N, Kluger HM. Tumor microvessel density as a prognostic marker in high-risk renal cell carcinoma patients treated on

ECOG-ACRIN E2805. *Clin Cancer Res* 2018, 24(1):217-223. *co-first author

e) **Weiss SA**, Hanniford D, Hernando E, Osman I. Revisiting determinants of prognosis in cutaneous melanoma. *Cancer* 2015, 121(23):4108-4123.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/sarah.weiss.1/bibliography/public/

D. Additional Information: Research Support and/or Scholastic Performance

Completed Research Support

Yale SPORE in Lung Cancer Career Enhancement Program Herbst (PI) 08/01/19-07/31/21
Goals: To educate junior investigators who are committed to translational research in lung cancer or who have not previously conducted lung cancer focused research.
Role: Investigator

K12CA215110 Kluger (PI) 08/01/18-07/31/21
NIH/NCI Calabresi Immuno-oncology Training Program
Goals: To train junior investigators to conduct patient-oriented cancer immunology and immunotherapy studies to accelerate the pace of these advances.
Role: I am the recipient of a 3-year award which provides protected time for training and research.

T32 AR064184 Orlow (PI) 07/01/15-06/30/16
NIH/NIAMS Cutaneous Biology and Skin Disease Training Program
Post-doctoral training program for physician scientists and PhDs who have a commitment to skin disease research
Mentor: Iman Osman, MD
Role: Investigator/trainee

NYU Physician Scientist Training Program Munger (PI) 07/01/15-06/30/16
Genomic characterization of acral lentiginous melanoma
Goal: To genomically profile acral melanomas to identify driver mutations, molecular alterations and downstream pathways that may be responsible for aggressive clinical behavior.
Mentor: Iman Osman, MD
Role: Investigator/trainee