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Research interests

Over the past years, my laboratory has focused on gene therapies and cancer immunotherapies. My laboratory has also, to a large extent, focused on elucidating the mechanisms underlying the establishment of immune suppressive tumor microenvironments, a major impediment to the success of immune-based cancer therapies and overcoming cancer cells' resistance to chemo-radiation therapies. Specifically, we have been examining the mechanisms of immune suppression that are mediated by myeloid derived suppressor cells, macrophages, B cells, and T regulatory cells. In addition, we have been studying the biology of cancer initiating cells, the control of differentiation of myeloid cells and tumor associated macrophages, and modulation of the tumor microenvironment, all of which will influence our ability to control malignant disease.

Our laboratory is working to further define the activation of cancer initiating cells, as well as the immunological changes inside the distinct tumor microenvironment, after administration of radiation therapy, chemotherapy, targeted therapeutics, T cell therapy, and antibody-based novel immune checkpoint therapies. This will help researchers and clinicians integrate conventional therapies with the ideal immunotherapies, thereby achieving the maximal therapeutic efficacy in patients. We are also investigating whether and how targeting therapeutics can overcome the stress-/inflammation-induced immune suppression that subsequently interferes with the success of immunotherapy and chemo/radiation therapy.

One of the primary aims of my lab is to examine how novel immune checkpoint pathways influence tumor growth, receptor/ligand interaction, and the tumor microenvironment. We also aim to develop novel therapeutic agents that effectively target tumors or tumor stromal cells, causing an increase local antigen priming and T cell activation/infiltration for subsequent immunotherapy. This is a key component of achieving long-term tumor remission and lasting immune memory. Using our newly developed immune checkpoints, nanotechnology, and T cell therapy, we can improve tumor targeting and reduce toxicity in patients. Collaborating with colleagues, we have been continually successful in obtaining support from NIH, DOD, and pharmaceutical companies, with the aim of developing novel therapeutic strategies through preclinical and clinical trials.

Program 1. Modulate tumor microenvironment to facilitate cancer immune therapy.

Program 2. Identify novel immune checkpoints, reprogram of myeloid cell/macrophage function and stress signaling to develop novel immune therapy strategies.

Program 3. Tumor inflammation on the regulation of tumor progression and metastases.

Program 4. The MDSC and macrophage mediated immune regulation in human health

Program 5. Synergist effect of innate and adaptive immune response for immune therapy

Employment

Emily Herrmann Chair in Immunology Research

Dr. Mary and Ron Neal Cancer Center
United States
Jul 1 2019 → present

Professor of Immunology in Medicine

Academic Institute
Houston, United States
Aug 1 2019 → present

Full Member

Research Institute
United States
Jul 1 2019 → present

Department of Medicine

United States
Jul 1 2019 → present

Houston Methodist

Houston, United States
May 22 2017 → present

Weill Cornell Medical College

Jan 1 2020 → present

Research output**Nanofluidic delivery implant sustains localization and maximizes efficacy of intratumoral immunotherapy**

Liu, H. C., Di Trani, N., Conte, M., Nguyen, D. C., Jokonya, S., Wu, A., Vander Pol, R., Joubert, A. L., Facchi, I., Wood, A. M., Ho, J., Pesaresi, F., Cauda, V., Chen, S. H., Liu, X., Stayton, P. S., Chua, C. Y. X. & Grattoni, A., Jun 2024, In: Nano Today. 56, 102258.

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Intratumoral nanofluidic system enhanced tumor biodistribution of PD-L1 antibody in triple-negative breast cancer

Liu, H-C., Capuani, S., Badachhape, A. A., Di Trani, N., Davila Gonzalez, D., Vander Pol, R. S., Viswanath, D. I., Saunders, S., Hernandez, N., Ghaghada, K. B., Chen, S-H., Nance, E., Annapragada, A. V., Chua, C. Y. X. & Grattoni, A., Nov 2023, In: Bioengineering and Translational Medicine. 8, 6, p. e10594 e10594.

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The Sympathetic Nervous System Modulates Cancer Vaccine Activity through Monocyte-Derived Cells

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Corrigendum: Analyzing One Cell at a TIME: Analysis of Myeloid Cell Contributions in the Tumor Immune Microenvironment

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Analyzing One Cell at a TIME: Analysis of Myeloid Cell Contributions in the Tumor Immune Microenvironment

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Activities

National Science and Technology Council, Taiwan (External organization)
Shu-Hsia Chen (Reviewer)
Dec 27 2023 → Dec 28 2023

Faculty Appointment and Promotion Committee for Academic Sinica (External organization)
Shu-Hsia Chen (Member)
Dec 6 2023

International Cancer Immunotherapy Conference
Shu-Hsia Chen (Participant)
Sep 20 2023 → Sep 23 2023

Harnessing neutrophils to improve the efficacy of immune checkpoint inhibitors in breast cancer
Shu-Hsia Chen (Mentor)
Jun 8 2023 → May 31 2025

The structure-activity of macromolecular platinum-based compounds for colorectal and ovarian cancer.
Shu-Hsia Chen (Mentor)
May 1 2023 → Apr 30 2025

From Laboratory to the Clinic: Overcoming Immunotherapy Failure from Non-responders To Responders
Shu-Hsia Chen (Speaker)
Apr 6 2023 → Apr 7 2023

THE LANDSCAPE OF SOLID TUMOR-INDUCED SYSTEMIC IMMUNE ALTERATION AT SINGLE-CELL RESOLUTION
Shu-Hsia Chen (Mentor)
Feb 23 2023

Elucidating Response to Anti-TNF- α in Patients with Ulcerative Colitis Using Imaging Mass Cytometry
Shu-Hsia Chen (Mentor)
Jan 1 2023

National Science and Technology Council, Taiwan (External organization)
Shu-Hsia Chen (Member)
Jan 1 2023 → ...

"The Plasticity of Myeloid Cell Differentiation and Macrophage Function in Tumor Microenvironment"
Shu-Hsia Chen (Speaker)
Nov 7 2022 → Nov 11 2022

"Modulating Microglia in Alzheimer's Disease"

Shu-Hsia Chen (Speaker)
Oct 26 2022

"From Laboratory to the Clinic: Medicine After COVID"

Shu-Hsia Chen (Speaker)
Oct 18 2022

"Medicine After COVID"

Shu-Hsia Chen (Speaker)
Sep 10 2022 → Sep 11 2022

Advisor for Baylor PhD student Che-Hsing "Kevin" Li thesis committee member and Susan Komen grant

Shu-Hsia Chen (Mentor)
Jul 1 2022 → ...

Advisor for Baylor PhD student Hai Wang thesis committee member and Susan Komen grant

Shu-Hsia Chen (Mentor)
Jul 1 2022 → ...

Christopher Fan, MD, PhD mentor, clinical investigator award for Houston Methodist Academic Institute

Shu-Hsia Chen (Mentor)
Jul 1 2022 → ...

Mentor for Texas A&M MD, PhD student Rachel Dubuque, MD, PhD

Shu-Hsia Chen (Mentor)
Jul 1 2022 → ...

"Analyzing One Cell at a Time: Analysis of Myeloid Cell Contribution in the Inflammatory Microenvironment"

Shu-Hsia Chen (Speaker)
Jun 29 2022

Mentor for Texas A&M MD, PhD student Alan Hodge, MD, PhD

Shu-Hsia Chen (Mentor)
Jul 1 2021 → ...

Keystone Symposia: Virtual Keystone Symposia 2021

Shu-Hsia Chen (Participant)
Mar 22 2021 → Mar 24 2021

NCI (External organization)

Shu-Hsia Chen (Reviewer)
Jan 1 2021 → ...

Identification of Epigenetic and Immune Biomarker Changes During the Progression of Non-Alcohol Fatty Disease (NAFLD) - related Hepatocellular Carcinoma

Shu-Hsia Chen (Invited speaker)
Nov 20 2020

Plasticity of Myeloid derived Suppressor Cells in Immune Therapy

Shu-Hsia Chen (Invited speaker)
Nov 10 2020

LILRBs Clinical Implications

Shu-Hsia Chen (Invited speaker)

Jul 1 2020

Turning the Balance of Myeloid Cell Functions for Immune Therapies

Shu-Hsia Chen (Invited speaker)

Feb 10 2020 → Feb 12 2020

MRC Research and Innovation Foundation (External organization)

Shu-Hsia Chen (Reviewer)

Jan 1 2020 → ...

Mt. Sinai School of Medicine (External organization)

Shu-Hsia Chen (Reviewer)

Jan 1 2020 → ...

Turning the Balance of Myeloid Cell Functions for Immunotherapy

Shu-Hsia Chen (Speaker)

Nov 19 2019 → Nov 20 2019

Turning the balance of Inflammation for Cancer Immunotherapy

Shu-Hsia Chen (Speaker)

Nov 1 2019

Modulation of Innate Immunity to Control Human Disease

Shu-Hsia Chen (Speaker)

Oct 27 2019 → Oct 28 2019

Immune Modulation of the Tumor Microenvironment for Enhancing Cancer

Shu-Hsia Chen (Speaker)

Oct 7 2019 → Oct 15 2019

MDSC Mediated Immune Suppression for GVHD while Retaining Graft Versus Leukemia Activity

Shu-Hsia Chen (Speaker)

Jul 17 2019 → Jul 30 2019

Blocking Immunoinhibitory Receptor Reprograms Tumor-Associated Myeloid Cells and Promotes Antitumor Immunity

Shu-Hsia Chen (Speaker)

Jun 7 2019 → Jun 12 2019

M1: Innate Immune Receptors: Roles in Immunology and Beyond

Shu-Hsia Chen (Speaker)

Mar 10 2019 → Mar 14 2019

Blocking Immunoinhibitory Receptor Reprograms Tumor-Associated Myeloid Cells and Promotes Antitumor Immunity

Shu-Hsia Chen (Speaker)

Mar 8 2019 → Mar 15 2019

Blocking immunoinhibitory receptor reprograms tumor-associated myeloid cells and promotes antitumor immunity

Shu-Hsia Chen (Speaker)

Nov 24 2018 → Dec 2 2018

NCI (External organization)

Shu-Hsia Chen (Member)

Sep 20 2018

Imaging Mass Cytometry User Group Meeting

Shu-Hsia Chen (Participant)

Sep 8 2018

The role of innate immunity for a long term anti tumor memory

Shu-Hsia Chen (Invited speaker)

Jun 30 2018

Tumor Microenvironment and Immunotherapy Forum

Shu-Hsia Chen (Speaker)

Jun 28 2018

Keystone Symposia Neurodegenerative Disease & neuroinflammation Meetings

Shu-Hsia Chen (Participant)

Jun 17 2018

Turning balance of inflammation: Good or bad for cancer

Shu-Hsia Chen (Speaker)

May 12 2018

Turning balance of inflammation: Good or bad for cancer

Shu-Hsia Chen (Speaker)

May 3 2018

NCI (External organization)

Shu-Hsia Chen (Member)

Mar 7 2018

Novel Immune Checkpoint on Innate Immunity

Shu-Hsia Chen (Invited speaker)

Jan 10 2018

The Plasticity of myeloid cell differentiation and macrophage function in tumor microenvironment:

Shu-Hsia Chen (Invited speaker)

Nov 21 2017

Immunology Program at Houston Methodist

Shu-Hsia Chen (Invited speaker)

Nov 3 2017

Imaging Cytof (IMC) Workshop

Shu-Hsia Chen (Invited speaker)

Sep 16 2017

New class of checkpoint inhibitors

Shu-Hsia Chen (Keynote speaker)

Aug 18 2017

The Plasticity of myeloid cell differentiation and macrophage function in tumor microenvironment:

Shu-Hsia Chen (Invited speaker)

Aug 10 2017

The Plasticity of myeloid cell differentiation and macrophage function in tumor microenvironment
Shu-Hsia Chen (Invited speaker)
Jun 18 2017

The Plasticity of Myeloid Cell Differentiation and Macrophage Function in Tumor Microenvironment
Shu-Hsia Chen (Invited speaker)
Feb 16 2017

Tools and facilities (Current and future) Systematic Approach to a Translational Program
Shu-Hsia Chen (Keynote speaker)
Jan 17 2017

NIH (External organization)
Shu-Hsia Chen (Reviewer)
Jan 1 2010 → ...

DOD (CDMRP), Prostate Cancer Research Program (External organization)
Shu-Hsia Chen (Reviewer)
Jan 1 2009 → ...

DOD (CDMRP), Prostate Cancer Research Program (External organization)
Shu-Hsia Chen (Reviewer)
2007

National Center for Research Resources, NIH (External organization)
Shu-Hsia Chen (Ad hoc member)
2005

NIH, Center for Scientific Review, Special Emphasis Panel (External organization)
Shu-Hsia Chen (Ad hoc member)
2005

NIH, Center for Scientific Review, TTT study section (External organization)
Shu-Hsia Chen (Ad hoc member)
2005

NIH, Experimental Immunology study section (External organization)
Shu-Hsia Chen (Reviewer)
2003

NCI, RAID program (External organization)
Shu-Hsia Chen (Reviewer)
2001

NCI, RAID program (External organization)
Shu-Hsia Chen (Reviewer)
1999

American Association for Cancer Research (External organization)
Shu-Hsia Chen (Member)
Jan 1 1995 → ...

Society of Chinese Bioscientists in America (External organization)
Shu-Hsia Chen (Member)
Jan 1 1995 → ...

The American Association of Immunologists (External organization)

Shu-Hsia Chen (Member)

Jan 1 1995 → ...

Prizes

"Engineered CAR-T cells for the treatment of diffuse large B cell lymphoma"

Chen, Shu-Hsia (Recipient), Sep 18 2023

Houston Methodist Presidential Award

Chen, Shu-Hsia (Recipient), Nov 30 2023

Grants

IL-15 in Lupus

Chen, S.

University of Houston: \$121,125.00

9/30/21 → 9/29/23