

Stanford



Amy S. Tsai

- Postdoctoral Medical Fellow, Anesthesiology, Perioperative and Pain Medicine
- Resident in Surgery

Bio

CLINICAL FOCUS

- Residency
- Single Cell Immunology
- Mass cytometry
- Postoperative outcomes

HONORS AND AWARDS

- F32 Kirschstein-NRSA postdoctoral fellowship, NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES (2025-2026)
- TTE Fellowship Grant, Transplant and Tissue Engineering Center of Excellence (2024-2026)
- Kosaka Top Scholars Award, International Anesthesia Research Society (IARS) (2022)

INTERNET LINKS

- Google Scholar: <https://scholar.google.com/citations?user=1jxR9JIAAAAJ&hl=en>

Publications

PUBLICATIONS

- **Immune Modulation by Personalized vs Standard Prehabilitation Before Major Surgery: A Randomized Clinical Trial.** *JAMA surgery*
Cambriel, A., Tsai, A., Choisy, B., Sabayev, M., Hedou, J., Shelton, E., Singh, K., Amar, J., Badea, V., Bruckman, S., Ganio, E., Einhaus, J., Feyaerts, et al
2025
- **Infusion of young donor plasma components in older patients modifies the immune and inflammatory response to surgical tissue injury: a randomized clinical trial.** *Journal of translational medicine*
Gaudilliere, B., Xue, L., Tsai, A. S., Gao, X., McAllister, T. N., Tingle, M., Porras, G., Feinstein, I., Feyaerts, D., Verdonk, F., Sabayev, M., Hedou, J., Ganio, et al
2025; 23 (1): 183
- **Discovery of sparse, reliable omic biomarkers with Stabl.** *Nature biotechnology*
Hédou, J., Marić, I., Bellan, G., Einhaus, J., Gaudillière, D. K., Ladant, F. X., Verdonk, F., Stelzer, I. A., Feyaerts, D., Tsai, A. S., Ganio, E. A., Sabayev, M., Gillard, et al
2024
- **Neuroimaging is the new "spatial omic": multi-omic approaches to neuro-inflammation and immuno-thrombosis in acute ischemic stroke.** *Seminars in immunopathology*
Maier, B., Tsai, A. S., Einhaus, J. F., Desilles, J., Ho-Tin-Noe, B., Gory, B., Sirota, M., Leigh, R., Lemmens, R., Albers, G., Olivot, J., Mazighi, M., Gaudilliere, et al

2023

- **Integrated Single-Cell and Plasma Proteomic Modeling to Predict Surgical Site Complications: A Prospective Cohort Study.** *Annals of surgery*
Rumer, K. K., Hedou, J., Tsai, A., Einhaus, J., Verdonk, F., Stanley, N., Choisy, B., Ganio, E., Bonham, A., Jacobsen, D., Warrington, B., Gao, X., Tingle, et al
1800
- **Measuring the human immune response to surgery: multiomics for the prediction of postoperative outcomes.** *Current opinion in critical care*
Verdonk, F., Einhaus, J., Tsai, A. S., Hedou, J., Choisy, B., Gaudilliere, D., Kin, C., Aghaeepour, N., Angst, M. S., Gaudilliere, B.
2021
- **Integration of mechanistic immunological knowledge into a machine learning pipeline improves predictions** *NATURE MACHINE INTELLIGENCE*
Culos, A., Tsai, A. S., Stanley, N., Becker, M., Ghaemi, M. S., Mcllwain, D. R., Fallahzadeh, R., Tanada, A., Nassar, H., Espinosa, C., Xenochristou, M., Ganio, E., Peterson, et al
2020
- **Preferential inhibition of adaptive immune system dynamics by glucocorticoids in patients after acute surgical trauma.** *Nature communications*
Ganio, E. A., Stanley, N. n., Lindberg-Larsen, V. n., Einhaus, J. n., Tsai, A. S., Verdonk, F. n., Culos, A. n., Gahemi, S. n., Rumer, K. K., Stelzer, I. A., Gaudilliere, D. n., Tsai, E. n., Fallahzadeh, et al
2020; 11 (1): 3737
- **A year-long immune profile of the systemic response in acute stroke survivors.** *Brain : a journal of neurology*
Tsai, A. S., Berry, K., Beneyto, M. M., Gaudilliere, D., Ganio, E. A., Culos, A., Ghaemi, M. S., Choisy, B., Djebali, K., Einhaus, J. F., Bertrand, B., Tanada, A., Stanley, et al
2019
- **Deep Immune Profiling of an Arginine-Enriched Nutritional Intervention in Patients Undergoing Surgery** *JOURNAL OF IMMUNOLOGY*
Aghaeepour, N., Kin, C., Ganio, E. A., Jensen, K. P., Gaudilliere, D. K., Tingle, M., Tsai, A., Lancero, H. L., Choisy, B., McNeil, L. S., Okada, R., Shelton, A. A., Nolan, et al
2017; 199 (6): 2171–80
- **An immune clock of human pregnancy** *SCIENCE IMMUNOLOGY*
Aghaeepour, N., Ganio, E. A., Mcllwain, D., Tsai, A. S., Tingle, M., Van Gassen, S., Gaudilliere, D. K., Baca, Q., McNeil, L., Okada, R., Ghaemi, M. S., Furman, D., Wong, et al
2017; 2 (15)
- **Immune Profiling of Post-COVID Condition in Adults Living in Mexico: A Longitudinal Analysis of Immune and Proteomic Markers**
Anronikov, S., Meikle, C., Saavedra, S., Gallegos, A., Islas, L., Nunez, I., Chen, H., Feyaerts, D., Gillard, J., Tsai, A., Bonham, T., Genic, E., Nolan, et al
LIPPINCOTT WILLIAMS & WILKINS.2025: 230-231
- **Single-Cell Epigenetic Dynamics and Determinants of Surgical Outcomes**
Cambriel, A., Sabayev, M., Ganio, E., Angst, M., Bonham, T., Anronikov, A., Tsai, A., Diop, M., Einhaus, J., Feyaerts, D., Goodman, S., Drover, D., Verdonk, et al
LIPPINCOTT WILLIAMS & WILKINS.2025: 496
- **Immune Modulation by Personalized vs Standard Prehabilitation Program Before Major Surgery**
Cambriel, A., Tsai, A., Sabayev, M., Choisy, B., Hedou, J., Shelton, E., Singh, K., Amar, J., Badea, V., Bruckman, S., Ganio, E., Einhaus, J., Feyaerts, et al
LIPPINCOTT WILLIAMS & WILKINS.2025: 959
- **Modification of Post-operative Inflammation Through Infusion of a Young Donor Plasma Fraction in Older Patients**
Tsai, A., Xue, L., Gao, X., McAllister, T., Tingle, M., Porras, G., Feinstein, I., Feyaerts, D., Verdonk, F., Sabayev, M., Hedou, J., Ganio, E., Berson, et al
LIPPINCOTT WILLIAMS & WILKINS.2025: 965-967
- **Immune Profile of Palmar Cooling on Delayed Onset of Muscle Soreness**
Tsai, A., Vinh Cao, Anronikov, S., Miyazaki, K., Liu, C., Darracott, C., Einhaus, J., Gaudilliere, D., Gaudilliere, B., Heller, H.
LIPPINCOTT WILLIAMS & WILKINS.2025: 700-701

- **Spatial subsetting enables integrative modeling of oral squamous cell carcinoma multiplex imaging data.** *iScience*
Einhaus, J., Gaudilliere, D. K., Hedou, J., Feyaerts, D., Ozawa, M. G., Sato, M., Ganio, E. A., Tsai, A. S., Stelzer, I. A., Bruckman, K. C., Amar, J. N., Sabayev, M., Bonham, et al
2023; 26 (12): 108486
- **STABL Enables Reliable and Selective biomarker Discovery in Predictive Modeling of High Dimensional Omics Data**
Verdonk, F., Hedou, J., Maric, I., Bellan, G., Einhaus, J., Gaudilliere, D., Ladant, F., Stelzer, I., Feyaerts, D., Tsai, A., Bonham, A., Angst, M., Aghaeepour, et al
LIPPINCOTT WILLIAMS & WILKINS.2023: 814-821
- **Integrated Mass Cytometry Accurately Predicts Hemorrhagic Transformation Following Acute Ischaemic Stroke**
Tsai, A., Hedou, J., Einhaus, J., Feyaerts, D., Verdonk, F., Choisy, B., Desilles, J., Ho-Tin-Noe, B., Olivot, J., Mazighi, M., Gaudilliere, B.
LIPPINCOTT WILLIAMS & WILKINS.2023: 261-262
- **Stabl: sparse and reliable biomarker discovery in predictive modeling of high-dimensional omic data.** *Research square*
Hédou, J., Marić, I., Bellan, G., Einhaus, J., Gaudillière, D. K., Ladant, F. X., Verdonk, F., Stelzer, I. A., Feyaerts, D., Tsai, A. S., Ganio, E. A., Sabayev, M., Gillard, et al
2023
- **Integrated plasma proteomic and single-cell immune signaling network signatures demarcate mild, moderate, and severe COVID-19.** *Cell reports. Medicine*
Feyaerts, D., Hédou, J., Gillard, J., Chen, H., Tsai, E. S., Peterson, L. S., Ando, K., Manohar, M., Do, E., Dhondalay, G. K., Fitzpatrick, J., Artandi, M., Chang, et al
2022: 100680
- **Risk factors for prolonged time to hospital discharge after ambulatory cholecystectomy under general anaesthesia. A retrospective cohort study.** *International journal of surgery (London, England)*
Picard, L., Duceau, B., Cambriel, A., Voron, T., Makoudi, S., Tsai, A., Yazid, L., Soulier, A., Paugam, C., Lescot, T., Bonnet, F., Verdonk, F.
2022: 106706
- **Integrated single-cell and plasma proteomic modeling to predict surgical site complications, a prospective cohort study**
Tsai, A. S., Hedou, J., Einhaus, J., Rumer, K., Verdonk, F., Stanley, N., Choisy, B., Ganio, E. A., Bonham, A., Jacobsen, D., Warrington, B., Gao, X., Tingle, et al
LIPPINCOTT WILLIAMS & WILKINS.2022: 1204-1205
- **Multimodal, coached telehealth prehabilitation has high compliance and improves exercise and cognitive capacity prior to surgery: a pilot study**
Choisy, B., Hedou, J., Verdonk, F., Gaudilliere, D., Tsai, A. S., Shankar, K., Sato, M., Einhaus, J., Ganio, E. A., Bonham, A., Warrington, B., Ahmad, S., Tingle, et al
LIPPINCOTT WILLIAMS & WILKINS.2022: 415
- **An immune signature of postoperative cognitive dysfunction (POCD)**
Verdonk, F., Tsai, A. S., Hedou, J., Heifets, B. D., Gaudilliere, D., Bellan, G., Sharshar, T., Gaillard, R., Molliex, S., Feyaerts, D., Stelzer, I., Ganio, E. A., Sato, et al
LIPPINCOTT WILLIAMS & WILKINS.2022: 577-578
- **Multi-Omic, Longitudinal Profile of Third-Trimester Pregnancies Identifies a Molecular Switch That Predicts the Onset of Labor.**
Stelzer, I., Ghaemi, M., Han, X., Ando, K., Hedou, J., Feyaerts, D., Peterson, L., Ganio, E., Tsai, A., Tsai, E., Rumer, K., Stanley, N., Fallazadeh, et al
SPRINGER HEIDELBERG.2021: 233A-234A
- **Integrated trajectories of the maternal metabolome, proteome, and immunome predict labor onset.** *Science translational medicine*
Stelzer, I. A., Ghaemi, M. S., Han, X., Ando, K., Hedou, J. J., Feyaerts, D., Peterson, L. S., Rumer, K. K., Tsai, E. S., Ganio, E. A., Gaudilliere, D. K., Tsai, A. S., Choisy, et al
2021; 13 (592)
- **Integrated plasma proteomic and single-cell immune signaling network signatures demarcate mild, moderate, and severe COVID-19.** *bioRxiv : the preprint server for biology*
Feyaerts, D., Hédou, J., Gillard, J., Chen, H., Tsai, E. S., Peterson, L. S., Ando, K., Manohar, M., Do, E., Dhondalay, G. K., Fitzpatrick, J., Artandi, M., Chang, et al
2021

- **Human immune system adaptations to simulated microgravity revealed by single-cell mass cytometry.** *Scientific reports*
Spatz, J. M., Fulford, M. H., Tsai, A., Gaudilliere, D., Hedou, J., Ganio, E., Angst, M., Aghaeepour, N., Gaudilliere, B.
2021; 11 (1): 11872
- **Objective Activity Parameters Track Patient-Specific Physical Recovery Trajectories After Surgery and Link With Individual Preoperative Immune States.** *Annals of surgery*
Fallahzadeh, R., Verdonk, F., Ganio, E., Culos, A., Stanley, N., Marić, I., Chang, A. L., Becker, M., Phongpreecha, T., Xenochristou, M., De Francesco, D., Espinosa, C., Gao, et al
2021
- **A Peripheral Immune Signature of Labor Induction.** *Frontiers in immunology*
Ando, K., Hédou, J. J., Feyaerts, D., Han, X., Ganio, E. A., Tsai, E. S., Peterson, L. S., Verdonk, F., Tsai, A. S., Marić, I., Wong, R. J., Angst, M. S., Aghaeepour, et al
2021; 12: 725989
- **Single-Cell Analysis of the Neonatal Immune System Across the Gestational Age Continuum.** *Frontiers in immunology*
Peterson, L. S., Hedou, J., Ganio, E. A., Stelzer, I. A., Feyaerts, D., Harbert, E., Adusumelli, Y., Ando, K., Tsai, E. S., Tsai, A. S., Han, X., Ringle, M., Houghteling, et al
2021; 12: 714090
- **Integration of mechanistic immunological knowledge into a machine learning pipeline improves predictions.** *Nature machine intelligence*
Culos, A., Tsai, A. S., Stanley, N., Becker, M., Ghaemi, M. S., Mcllwain, D. R., Fallahzadeh, R., Tanada, A., Nassar, H., Espinosa, C., Xenochristou, M., Ganio, E., Peterson, et al
2020; 2 (10): 619-628
- **Multi-Omic, Longitudinal Profile of Third-Trimester Pregnancies Identifies a Molecular Switch That Predicts the Onset of Labor.**
Stelzer, I., Ghaemi, M., Han, X., Ando, K., Peterson, L., Contrepois, K., Ganio, E., Tsai, A., Tsai, E., Rumer, K., Stanley, N., Fallahzadeh, R., Becker, et al
SPRINGER HEIDELBERG.2020: 89A
- **Multiomic immune clockworks of pregnancy.** *Seminars in immunopathology*
Peterson, L. S., Stelzer, I. A., Tsai, A. S., Ghaemi, M. S., Han, X. n., Ando, K. n., Winn, V. D., Martinez, N. R., Contrepois, K. n., Moufarrej, M. N., Quake, S. n., Relman, D. A., Snyder, et al
2020
- **Multiomics Characterization of Preterm Birth in Low- and Middle-Income Countries.** *JAMA network open*
Jehan, F. n., Sazawal, S. n., Baqui, A. H., Nisar, M. I., Dhingra, U. n., Khanam, R. n., Ilyas, M. n., Dutta, A. n., Mitra, D. K., Mehmood, U. n., Deb, S. n., Mahmud, A. n., Hotwani, et al
2020; 3 (12): e2029655
- **Author Correction: Preferential inhibition of adaptive immune system dynamics by glucocorticoids in patients after acute surgical trauma.** *Nature communications*
Ganio, E. A., Stanley, N. n., Lindberg-Larsen, V. n., Einhaus, J. n., Tsai, A. S., Verdonk, F. n., Culos, A. n., Ghaemi, S. n., Rumer, K. K., Stelzer, I. A., Gaudilliere, D. n., Tsai, E. n., Fallahzadeh, et al
2020; 11 (1): 4495
- **VoPo leverages cellular heterogeneity for predictive modeling of single-cell data.** *Nature communications*
Stanley, N. n., Stelzer, I. A., Tsai, A. S., Fallahzadeh, R. n., Ganio, E. n., Becker, M. n., Phongpreecha, T. n., Nassar, H. n., Ghaemi, S. n., Maric, I. n., Culos, A. n., Chang, A. L., Xenochristou, et al
2020; 11 (1): 3738
- **Differential Dynamics of the Maternal Immune System in Healthy Pregnancy and Preeclampsia** *FRONTIERS IN IMMUNOLOGY*
Han, X., Ghaemi, M. S., Ando, K., Peterson, L. S., Ganio, E. A., Tsai, A. S., Gaudilliere, D. K., Stelzer, I. A., Einhaus, J., Bertrand, B., Stanley, N., Culos, A., Tanada, et al
2019; 10
- **Differential Dynamics of the Maternal Immune System in Healthy Pregnancy and Preeclampsia.** *Frontiers in immunology*
Han, X., Ghaemi, M. S., Ando, K., Peterson, L. S., Ganio, E. A., Tsai, A. S., Gaudilliere, D. K., Stelzer, I. A., Einhaus, J., Bertrand, B., Stanley, N., Culos, A., Tanada, et al
2019; 10: 1305

- **A YEAR-LONG IMMUNE PROFILE OF THE SYSTEMIC RESPONSE IN ACUTE STROKE SURVIVORS**

Tsai, A., Berry, K., Beneyto, M. M., Gaudilliere, D., Ganio, E. A., Culos, A., Ghaemi, M. S., Choisy, B., Djebali, K., Einhaus, J. F., Bertrand, B., Tanada, A., Stanley, et al

LIPPINCOTT WILLIAMS & WILKINS.2019: 155

- **DEEP IMMUNE PROFILE OF PREOPERATIVE GLUCOCORTICOID ADMINISTRATION IN PATIENTS UNDERGOING SURGERY**

Rumer, K., Ganio, E. A., Stanley, N., Einhaus, J., Tsai, A. S., Culos, A., Fallazadeh, R., Lindberg-Larsen, V., Kehlet, H., Angst, M., Aghaeepour, N., Gaudilliere, B.

LIPPINCOTT WILLIAMS & WILKINS.2019: 140

- **DEEP IMMUNE PROFILE OF PREOPERATIVE GLUCOCORTICOID ADMINISTRATION IN PATIENTS UNDERGOING SURGERY**

Gaudilliere, B., Ganio, E. A., Stanley, N., Einhaus, J., Tsai, A. S., Culos, A., Rumer, K., Fallahzadeh, R., Lindberg-Larsen, V., Kehlet, H., Angst, M. S., Aghaeepour, N.

LIPPINCOTT WILLIAMS & WILKINS.2019: 733

- **Utilizing Single Cell Immune Profiling to Identify Serum-based Biomarkers for Transient Ischemic Attacks**

Therkelsen, K., Tsai, A., Mlynash, M., Oh, B., Eynhorn, I., Gaudilliere, B., George, P.

LIPPINCOTT WILLIAMS & WILKINS.2019

- **Differential Dynamics of the Maternal Immune System in Healthy Pregnancy and Preeclampsia.**

Han, X., Ghaemi, M. S., Ando, K., Peterson, L., Ganio, E. A., Tsai, A. S., Gaudilliere, D., Einhaus, J., Tsai, E. S., Stanley, N. M., Culos, A., Taneda, A. H., Fallahzadeh, et al

SAGE PUBLICATIONS INC.2019: 271A

- **Deep Immune Profiling of the Post-Stroke Peripheral Immune Response Reveals Tri-phasic Response and Correlations With Long-Term Cognitive Outcomes**

Tsai, A. S., Berry, K., Beneyto, M. M., Gaudilliere, D., Ganio, E. A., Choisy, B., Djebali, K., Baca, Q., Quach, L., Drag, L., Lansberg, M. G., Angst, M. S., Gaudilliere, et al

LIPPINCOTT WILLIAMS & WILKINS.2019

- **Multomics modeling of the immunome, transcriptome, microbiome, proteome and metabolome adaptations during human pregnancy. *Bioinformatics (Oxford, England)***

Ghaemi, M. S., DiGiulio, D. B., Contrepolis, K., Callahan, B., Ngo, T. T., Lee-McMullen, B., Lehallier, B., Robaczewska, A., Mcilwain, D., Rosenberg-Hasson, Y., Wong, R. J., Quaintance, C., Culos, et al

2019; 35 (1): 95–103

- **Systemic Immunologic Consequences of Chronic Periodontitis. *Journal of dental research***

Gaudilliere, D. K., Culos, A. n., Djebali, K. n., Tsai, A. S., Ganio, E. A., Choi, W. M., Han, X. n., Maghaireh, A. n., Choisy, B. n., Baca, Q. n., Einhaus, J. F., Hedou, J. J., Bertrand, et al

2019: 22034519857714

- **Multomics modeling of the immunome, transcriptome, microbiome, proteome and metabolome adaptations during human pregnancy *BIOINFORMATICS***

Ghaemi, M., DiGiulio, D. B., Contrepolis, K., Callahan, B., Ngo, T. T. M., Lee-McMullen, B., Lehallier, B., Robaczewska, A., Mcilwain, D., Rosenberg-Hasson, Y., Wong, R. J., Quaintance, C., Culos, et al

2019; 35 (1): 95–103

- **Mass Cytometry and Proteomic Based Prediction of the Onset of Labor.**

Ando, K., Han, X., Ghaemi, S., Tsai, A., Ganio, E., Gaudilliere, D., Culos, T., Shaw, G., Wong, R., Stevenson, D., Carvalho, B., Tingle, M., Angst, et al

SAGE PUBLICATIONS INC.2018: 153A

- **Deep Immune Profiling of an Arginine-Enriched Nutritional Intervention in Patients Undergoing Surgery. *Journal of immunology (Baltimore, Md. : 1950)***

Aghaeepour, N. n., Kin, C. n., Ganio, E. A., Jensen, K. P., Gaudilliere, D. K., Tingle, M. n., Tsai, A. n., Lancero, H. L., Choisy, B. n., McNeil, L. S., Okada, R. n., Shelton, A. A., Nolan, et al

2017

- **An immune clock of human pregnancy. *Science immunology***

Aghaeepour, N. n., Ganio, E. A., Mcilwain, D. n., Tsai, A. S., Tingle, M. n., Van Gassen, S. n., Gaudilliere, D. K., Baca, Q. n., McNeil, L. n., Okada, R. n., Ghaemi, M. S., Furman, D. n., Wong, et al

2017; 2 (15)

- **New genetic resources and a preliminary multi-locus assessment of species boundaries in the *Batis capensis* species complex (Passeriformes: Platysteridae)** *BIOCHEMICAL SYSTEMATICS AND ECOLOGY*

Wogan, G. O. U., Feldheim, K. A., Tsai, A. S., Brown, A. A., Kapelke, J., Galinato, M., Tung, J. N., Bates, J. M., Kaliba, P., Voelker, G., Bowie, R. C. K.

2016; 65: 83-88