Stanford

Nathan Reticker-Flynn, PhD

Assistant Professor of Otolaryngology - Head & Neck Surgery (OHNS)

Otolaryngology (Head and Neck Surgery)

Bio

BIO

Nathan is a Biomedical Engineer and tumor immunologist working at the interfaces of cancer metastasis, tumor evolution, adaptive immunity, and immuno-oncology. His work employs mouse models and systems biology and genetic engineering to investigate interactions between tumors and the immune system during cancer metastasis. He performed his PhD work in Biomedical Engineering with Dr. Sangeeta Bhatia at MIT where he studied glycobiology and ECM interactions during cancer metastasis and his postdoctoral studies with Dr. Edgar Engleman at Stanford where he studied systemic immune responses during metastatic progression and in the context of immunotherapy.

ACADEMIC APPOINTMENTS

- Assistant Professor, Otolaryngology (Head and Neck Surgery)
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

PROFESSIONAL EDUCATION

- Ph.D., Massachusetts Institute of Technology , Biomedical Engineering (2013)
- M.S., Massachusetts Institute of Technology , Mechanical Engineering (2008)
- B.S., Tufts University , Mechanical Engineering (2006)

LINKS

- Lab Website: https://www.retickerflynnlab.com/
- Google Scholar: https://scholar.google.com/citations?user=SOEgZREAAAAJ

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We employ animal models, synthetic biology, and systems approaches to build an understanding of the tolerance mechanisms and coevolutionary dynamics underpinning tumor-immune interactions during metastasis and use insights gleaned from these studies to develop novel technologies and engineered therapies for the treatment of metastatic disease and immunological disorders.

Teaching

COURSES

2024-25

- Tumor Immunology: IMMUNOL 275 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Potchara Boonrat, Peter Du, Griffin Hartmann, Karsten Householder, Humza Khan, Keene Lee, Liz Lopez, Audre May, Jaclyn Ng, Natalie Pilla, Colin Raposo, Oliver Takacsi-Nagy, Amanda Verzosa, Cameron Walker

Orals Chair

Santiago Sanchez

Postdoctoral Faculty Sponsor

Arash Saeedi, Zhewen Xiong

Doctoral Dissertation Advisor (AC)

Cort Breuer, Ryan Feitzinger, Punya Gupta, Norma Gutierrez, Marcos Labrado, Yujung Park, George Wythes

Doctoral Dissertation Co-Advisor (AC)

Markus Diehl

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (Phd Program)
- Immunology (Phd Program)

Publications

PUBLICATIONS

- **Spontaneous and experimental models of lymph node metastasis.** *Nature protocols*
  Breuer, C. B., Xiong, Z., Wang, A., Rodriguez, G. E., Abhiraman, G. C., Garcia, K. C., Reticker-Flynn, N. E.
  2025
- **Lymph nodes: at the intersection of cancer treatment and progression.** *Trends in cell biology*
  Reticker-Flynn, N. E., Engleman, E. G.
  2023
- **Lymph node colonization induces tumor-immune tolerance to promote distant metastasis.** *Cell*
  Reticker-Flynn, N. E., Zhang, W., Belk, J. A., Basto, P. A., Escalante, N. K., Pilarowski, G. O., Bejnood, A., Martins, M. M., Kenkel, J. A., Linde, I. L., Bagchi, S., Yuan, R., Chang, et al
  2022
- **Cancer systems immunology.** *eLife*
  Reticker-Flynn, N. E., Engleman, E. G.
  2020; 9
- **Systemic Immunity Is Required for Effective Cancer Immunotherapy.** *Cell*
  Spitzer, M. H., Carmi, Y., Reticker-Flynn, N. E., Kwek, S. S., Madhireddy, D., Martins, M. M., Gherardini, P. F., Prestwood, T. R., Chabon, J., Bendall, S. C., Fong, L., Nolan, G. P., Engleman, et al
  2017; 168 (3): 487-502 e15

- **Aberrant Glycosylation Promotes Lung Cancer Metastasis through Adhesion to Galectins in the Metastatic Niche** *CANCER DISCOVERY*
  Reticker-Flynn, N. E., Bhatia, S. N.
  2015; 5 (2): 168-181

- **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

- **Lymph node colonization induces tissue remodeling via immunosuppressive fibroblast-myeloid cell niches supporting metastatic tolerance.** *Cancer cell*
  Haist, M., Baertsch, M. A., Reticker-Flynn, N. E., Lu, G., Kempchen, T. N., Chu, P., Vazquez, G., Chen, H., Sunwoo, J. B., Zhang, W., Laseinde, E., Adami, B., Zimmer, et al
  2026

- **Mitochondrial transfer from immune to tumor cells enables lymph node metastasis.** *Cell metabolism*
  Terasaki, A., Bhatnagar, K., Weiner, A. T., Tan, Y., Szeifert, V., Huang, H. L., Wiggers, L., Rodrigues, V., Rada, C. C., Shankar, V., Saito, S., Ankomah, P. O., Roth, et al
  2026

- **Erythropoietin receptor on cDC1s dictates immune tolerance.** *Nature*
  Zhang, X., McGinnis, C. S., Yu, G., Chen, S., Zheng, P., Schürch, C. M., Hiam-Galvez, K. J., Reticker-Flynn, N. E., Guo, W., Yao, W., Qiu, J., Muselman, A., Linde, et al
  2025

- **Reflections on Advances in Cancer Research in 2025** *CANCER DISCOVERY*
  Bernard, E., Cortes-Ciriano, I., Gaiti, F., Gan, S., Jiang, S., Kovatcheva, M., Meisel, M., Reticker-Flynn, N. E., Schram, A. M., Shoshani, O., Silverbush, D., Venkataramani, V., Weeden, et al
  2025; 15 (12): 2422-2430

- **Lymph node environment drives FSP1 targetability in metastasizing melanoma.** *Nature*
  Palma, M., Chaufan, M., Breuer, C. B., Müller, S., Sabatier, M., Fraser, C. S., Szylo, K. J., Yavari, M., Carmona, A., Kaur, M., Melo, L. M., Cansiz, F., Monge-Lorenzo, et al
  2025

- **Harnessing neutrophils to prevent metastasis**
  Diehl, M., Reticker-Flynn, N. E., Engleman, E. G.
  OXFORD UNIV PRESS.2025

- **Tumor-derived erythropoietin acts as an immunosuppressive switch in cancer immunity.** *Science (New York, N.Y.)*
  Chiu, D. K., Zhang, X., Cheng, B. Y., Liu, Q., Hayashi, K., Yu, B., Lee, R., Zhang, C., An, X., Rajadas, J., Reticker-Flynn, N. E., Rankin, E. B., Engleman, et al
  2025; 388 (6745): eadr3026

- **IL-12-producing cytokine factories induce precursor exhausted T cells and elimination of primary and metastatic tumors.** *Journal for immunotherapy of cancer*
  Nash, A., DeBonis, J., Murungi, D., Castillo, B., Kim, B., Hu, F., Chambers, C., Nguyen, A., Hernandez, A., Wang, Z., Rios, P. D., Ghani, S., Joshi, et al
  2025; 13 (4)

- **Redirecting immune signaling with cytokine adaptors.** *Nature communications*
  Abhiraman, G. C., Householder, K. D., Rodriguez, G. E., Glassman, C. R., Saxton, R. A., Breuer, C. B., Wilson, S. C., Su, L., Yen, M., Hsu, C., Pillarisetty, V. G., Reticker-Flynn, N. E., Garcia, et al
  2025; 16 (1): 2432

- **The temporal progression of lung immune remodeling during breast cancer metastasis.** *Cancer cell*
  McGinnis, C. S., Miao, Z., Superville, D., Yao, W., Goga, A., Reticker-Flynn, N. E., Winkler, J., Satpathy, A. T.
  2024

- **Interrogating the roles of lymph node metastasis in systemic immune surveillance.** *Clinical & experimental metastasis*
  Basto, P. A., Reticker-Flynn, N. E.

2024

- **Neutrophil-activating therapy for the treatment of cancer.** *Cancer cell*
  Linde, I. L., Prestwood, T. R., Qiu, J., Pilarowski, G., Linde, M. H., Zhang, X., Shen, L., Reticker-Flynn, N. E., Chiu, D. K., Sheu, L. Y., Van Deursen, S., Tolentino, L. L., Song, et al
  2023

- **Transient cell-in-cell formation underlies tumor relapse and resistance to immunotherapy.** *eLife*
  Gutwillig, A., Santana-Magal, N., Farhat-Younis, L., Rasoulouniriana, D., Madi, A., Luxenburg, C., Cohen, J., Padmanabhan, K., Shomron, N., Shapira, G., Gleiberman, A., Parikh, R., Levy, et al
  2022; 11

- **Identification of cell types in multiplexed in situ images by combining protein expression and spatial information using CELESTA.** *Nature methods*
  Zhang, W., Li, I., Reticker-Flynn, N. E., Good, Z., Chang, S., Samusik, N., Saumyaa, S., Li, Y., Zhou, X., Liang, R., Kong, C. S., Le, Q., Gentles, et al
  2022

- **Skip metastasis in mediastinal lymph node is a favorable prognostic factor in N2 lung cancer patients: a meta-analysis** *ANNALS OF TRANSLATIONAL MEDICINE*
  Wang, Z., Cheng, J., Huang, W., Cheng, D., Liu, Y., Pu, Q., Reticker-Flynn, N. E., Liu, L.
  2021; 9 (3): 218

- **Lymph node colonization promotes distant tumor metastasis through the induction of tumor-specific immunosuppression**
  Reticker-Flynn, N. E., Basto, P. A., Zhang, W., Martins, M. M., Chang, S., Gentles, A. J., Sunwoo, J. B., Plevritis, S. K., Engleman, E. G.
  AMER ASSOC CANCER RESEARCH.2020

- **Lymph node colonization promotes distant tumor metastasis through the induction of tumor-specific immunosuppression.**
  Reticker-Flynn, N. E., Basto, P. A., Zhang, W., Bejnood, A., Kenkel, J. A., Martins, M. M., Chang, S., Gentles, A. J., Sunwoo, J. B., Plevritis, S. K., Engleman, E. G.
  AMER ASSOC CANCER RESEARCH.2020: 25–26

- **Melanoma-secreted lysosomes trigger monocyte-derived dendritic cell apoptosis and limit cancer immunotherapy.** *Cancer research*
  Santana-Magal, N. n., Farhat-Younis, L. n., Gutwillig, A. n., Gleiberman, A. n., Rasoulouniriana, D. n., Tal, L. n., Netanely, D. n., Shamir, R. n., Blau, R. n., Feinmesser, M. n., Zlotnik, O. n., Gutman, H. n., Linde, et al
  2020

- **A distinct subset of FcgammaRI-expressing Th1 cells exert antibody-mediated cytotoxic activity.** *The Journal of clinical investigation*
  Rasoulouniriana, D., Santana-Magal, N., Gutwillig, A., Farhat-Younis, L., Wine, Y., Saperia, C., Tal, L., Gutman, H., Tsivian, A., Brenner, R., Bandora, E. A., Reticker-Flynn, N. E., Rider, et al
  2019

- **Lymph node colonization promotes distant tumor metastasis through the induction of systemic immune tolerance**
  Reticker-Flynn, N. E., Martins, M. M., Basto, P. A., Zhang, W., Bejnood, A., Gentles, A. J., Sunwoo, J. B., Plevritis, S. K., Engleman, E. G.
  AMER ASSOC CANCER RESEARCH.2019

- **A gut punch fights cancer and infection** *NATURE*
  Reticker-Flynn, N. E., Engleman, E. G.
  2019; 565 (7741): 573–74

- **An Immunosuppressive Dendritic Cell Subset Accumulates at Secondary Sites and Promotes Metastasis in Pancreatic Cancer.** *Cancer research*
  Kenkel, J. A., Tseng, W. W., Davidson, M. G., Tolentino, L. L., Choi, O., Bhattacharya, N., Seeley, E. S., Winer, D. A., Reticker-Flynn, N. E., Engleman, E. G.
  2017; 77 (15): 4158-4170

- **Akt and SHP-1 are DC-intrinsic checkpoints for tumor immunity.** *JCI insight*
  Carmi, Y., Prestwood, T. R., Spitzer, M. H., Linde, I. L., Chabon, J., Reticker-Flynn, N. E., Bhattacharya, N., Zhang, H., Zhang, X., Basto, P. A., Burt, B. M., Alonso, M. N., Engleman, et al
  2016; 1 (18)

- **Normalizing Microbiota-Induced Retinoic Acid Deficiency Stimulates Protective CD8(+) T Cell-Mediated Immunity in Colorectal Cancer.** *Immunity*

Bhattacharya, N., Yuan, R., Prestwood, T. R., Penny, H. L., DiMaio, M. A., Reticker-Flynn, N. E., Krois, C. R., Kenkel, J. A., Pham, T. D., Carmi, Y., Tolentino, L., Choi, O., Hulett, et al

2016; 45 (3): 641-655

- **Extracellular matrix microarrays to study inductive signaling for endoderm specification.** *Acta biomaterialia*

  Malta, D. F., Reticker-Flynn, N. E., da Silva, C. L., Cabral, J. M., Fleming, H. E., Zaret, K. S., Bhatia, S. N., Underhill, G. H.

  2016; 34: 30-40

- **Normalizing microbiota-induced retinoic acid deficiency stimulates protective CD8+ T-cell-mediated immunity in colorectal cancer** *Immunity*

  Bhattacharya, N., Yuan, R., Prestwood, T., Penny, H., DiMaio, M., Reticker-Flynn, N., Krois, C., Kenkel, J., Pham, T., Carmi, Y., Tolentino, L., Choi, O., Hulett, et al

  2016; 45: 641–55

- **Akt and SHP-1 are DC-intrinsic checkpoints for tumor immunity.** *JCI insight*

  Carmi, Y. n., Prestwood, T. R., Spitzer, M. H., Linde, I. L., Chabon, J. n., Reticker-Flynn, N. E., Bhattacharya, N. n., Zhang, H. n., Zhang, X. n., Basto, P. A., Burt, B. M., Alonso, M. N., Engleman, et al

  2016; 1 (18): e89020

- **Adhesion of tumor cells to ECM microarrays identifies novel ECM interactions in metastasis**

  Reticker-Flynn, N. E., Braga Malta, D. F., Winslow, M. M., Xu, M. J., Lamar, J. M., Hynes, R. O., Jacks, T. E., Bhatia, S. N.

  AMER ASSOC CANCER RESEARCH.2012