Stanford

Theodore Roth

- Affiliate, Dean's Office Operations - Dean Other
- Resident in Pathology
- Curriculum Vitae available Online

Bio

BIO

Theo Roth, MD PhD, was born in St. Louis, Missouri and grew up in Birmingham, Alabama before completing his undergraduate degree in Biology with Honors at Stanford University, along with a coterminal Master's degree in Biomedical Informatics. He completed his MD/PhD training in the Medical Scientist Training Program at the University of California, San Francisco. During his PhD work at UCSF with Dr. Alex Marson, he developed non-viral genome targeting, a new efficient method for large scale genetic engineering of diverse primary human immune cell types without the need for complex viral vectors. He further developed pooled knock-in screening, enabling rapid discovery of synthetic sequences to re-wire immune cell genomes and associate synthetic genotypes with high dimensional single cell phenotypes. Pooled screening of TCR and CAR T cell therapies has highlighted synthetic genetic perturbations with improved context dependent fitness profiles matched to specific solid tumor settings. After concluding his PhD, Theo co-founded ArsenalBio, and served as Arsenal’s founding Chief Scientific Officer for a year before returning to UCSF to complete his MD. He is currently completing his residency in Clinical Pathology at Stanford University.

CLINICAL FOCUS

- Residency
- Clinical Pathology

PATENTS

- Theodore Roth. "United States Patent 11,033,584 Targeted replacement of endogenous T cell receptors", Regents of the University of California
- Theodore Roth. "United States Patent 9,308,163 Methods of Treating and Preventing Diseases and Disorders of the Central Nervous System", National Institutes of Health

INTERNET LINKS

- Google Scholar Profile: https://scholar.google.com/citations?hl=en&user=Ue3WxuYAAAAJ

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Scalable technologies for engineering next generation cellular therapies

Publications

PUBLICATIONS

- **The CD28-Transmembrane Domain Mediates Chimeric Antigen Receptor Heterodimerization With CD28** *FRONTIERS IN IMMUNOLOGY*
  Muller, Y. D., Nguyen, D. P., Ferreira, L. R., Ho, P., Raffin, C., Valencia, R., Congrave-Wilson, Z., Roth, T. L., Eyquem, J., Van Gool, F., Marson, A., Perez, L., Wells, et al

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- **TCF-1 regulates HIV-specific CD8+ T cell expansion capacity.** *JCI insight*
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- **Genetic Disease and Therapy.** *Annual review of pathology*
  Roth, T. L., Marson, A.
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- **Comparative host-coronavirus protein interaction networks reveal pan-viral disease mechanisms** *SCIENCE*
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- **Polymer-stabilized Cas9 nanoparticles and modified repair templates increase genome editing efficiency.** *Nature biotechnology*
  Nguyen, D. N., Roth, T. L., Li, P. J., Chen, P. A., Apathy, R., Mamedov, M. R., Vo, L. T., Tobin, V. R., Goodman, D., Shifrut, E., Bluestone, J. A., Puck, J. M., Szoka, et al
  2020; 38 (1): 44-49

- **Editing of Endogenous Genes in Cellular Immunotherapies.** *Current hematologic malignancy reports*
  Roth, T. L.
  2020; 15 (4): 235-240

- **Functional CRISPR dissection of gene networks controlling human regulatory T cell identity.** *Nature immunology*
  Schumann, K., Raju, S. S., Lauber, M., Kolb, S., Shifrut, E., Cortez, J. T., Skartsis, N., Nguyen, V. Q., Woo, J. M., Roth, T. L., Yu, R., Nguyen, M. L., Simeonov, et al
  2020; 21 (11): 1456-1466

- **A SARS-CoV-2 protein interaction map reveals targets for drug repurposing.** *Nature*
  Gordon, D. E., Jang, G. M., Bouhaddou, M., Xu, J., Obernier, K., White, K. M., O'Meara, M. J., Rezelj, V. V., Guo, J. Z., Swaney, D. L., Tummino, T. A., Hüttenhain, R., Kaake, et al
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- **CRISPR screen in regulatory T cells reveals modulators of Foxp3.** *Nature*
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- **A large CRISPR-induced bystander mutation causes immune dysregulation.** *Communications biology*
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- **CRISPR-Cas9 genome engineering of primary CD4+ T cells for the interrogation of HIV-host factor interactions.** *Nature protocols*
  Hultquist, J. F., Hiatt, J., Schumann, K., McGregor, M. J., Roth, T. L., Haas, P., Doudna, J. A., Marson, A., Krogan, N. J.
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- **Reprogramming human T cell function and specificity with non-viral genome targeting** *NATURE*
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- **Genetic engineering in primary human B cells with CRISPR-Cas9 ribonucleoproteins.** *Journal of immunological methods*
  Wu, C. M., Roth, T. L., Baglaenko, Y., Ferri, D. M., Brauer, P., Zuniga-Pflucker, J. C., Rosbe, K. W., Wither, J. E., Marson, A., Allen, C. D.
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- **Genome-wide CRISPR Screens in Primary Human T Cells Reveal Key Regulators of Immune Function.** *Cell*
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- **Enhanced Genome Editing with Cas9 Ribonucleoprotein in Diverse Cells and Organisms.** *Journal of visualized experiments : JoVE*
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