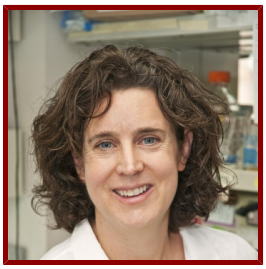
Stanford



Catherine Blish

George E. and Lucy Becker Professor in Medicine

Medicine - Infectious Diseases

CLINICAL OFFICE (PRIMARY)

- **Infectious Disease Clinic**

  300 Pasteur Dr Rm L134

  Lane Bldg MC 5107

  Stanford, CA 94305

  Tel (650) 723-6961 **Fax** (650) 725-8418

Bio

CLINICAL FOCUS

- Infectious Disease

ACADEMIC APPOINTMENTS

- Professor, Medicine - Infectious Diseases
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)

ADMINISTRATIVE APPOINTMENTS

- Associate Dean for Basic and Translational Research, Stanford University School of Medicine, (2021- present)
- Co-Director, Stanford MSTP, (2022- present)
- Associate Director, Stanford Medical Scientist Training Program (MSTP), (2014-2021)
- Fellow, Stanford Center for Innovation in Global Health (CIGH), (2015- present)

HONORS AND AWARDS

- NIDA Avant Garde Award for HIV Research, NIH/NIAID (2018)
- Outstanding Investigator Award, Western Society for Clinical Investigation (2018)
- Chan Zuckerberg Investigator, Chan Zuckerberg Biohub (2017)
- Fellow, Infectious Diseases Society of America (2017)
- Investigator in the Pathogenesis of Infectious Diseases, Burroughs Wellcome Foundation (2017)
- Outstanding Investigator Award, Western Society for Clinical Investigation (2017)
- Elected Member, American Society for Clinical Investigation (2016)
- Tashia and John Morgridge Faculty Scholar in Pediatric Translational Medicine, Stanford Child Health Research Institute (2015)

- Clinical Scientist Development Award, Doris Duke Charitable Foundation (2013)
- Faculty Scholar, Donald E. and Delia B. Baxter Foundation (2013)
- NIH Director's New Innovator Award, NIH (2013)
- McCormick Faculty Award, Stanford University School of Medicine, Office of Diversity and Leadership (2012)
- Outstanding Faculty Mentor Award, Stanford Immunology (2012)
- Young Investigator Award, Arnold and Mabel Beckman Foundation (2012)
- ICAAC Young Investigator Award, American Society for Microbiology (2010)
- Young and Early Career Investigator, Enterprise-OCTAVE Workshop on Correlates of Vaccine Protection to HIV (2010)
- New Investigator Award, University of Washington Center for AIDS Research (2009)
- Young Investigator Award, AIDS Vaccine, Seattle, WA (2007)
- Outstanding Consultant, Infectious Diseases, MedCon (2003)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Infectious Diseases Society of America (2013 - present)
- Member, American Association of Immunologists (2012 - present)
- Member, American Society for Microbiology (2009 - present)

PROFESSIONAL EDUCATION

- Medical Education: University of Washington Registration and Transcripts Office (2001) WA
- PhD Training: University of Washington School of Medicine (1999) WA
- Residency: University of Washington Medical Center Dept of Medicine (2003) WA
- Fellowship: University of Washington Infectious Disease Program (2007) WA
- Board Certification: Infectious Disease, American Board of Internal Medicine (2006)
- PhD, University of Washington , Immunology (1999)
- BS, University of California, Davis , Biochemistry (1993)

LINKS

- The Blish Lab Website: http://med.stanford.edu/blishlab.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our goal is to develop new methods to prevent and control infectious diseases through better understanding of human immunology. We have several major areas of ongoing investigation.

Understanding the diversity and biology of human natural killer (NK) cells.

Our interest in NK cells stems from their ability to directly lyse infected and tumor cells and to mediate antibody-dependent cellular cytotoxicity, acting as a bridge between innate and adaptive immune responses. Our recent study demonstrated that human NK cells are much more diverse than previously appreciated, with both genetic and environmental determinants. We are currently examining how this diversity is regulated and its implications for viral immunity in both healthy and diseased states.

Defining the role of NK cells in viral immunity.

Vaccination is one of the most effective methods to prevent morbidity and mortality related to infectious diseases, yet there are many viral infections for which durable, broadly cross-protective vaccines remain desperately needed. Recent data indicating that NK cells may be capable of immunologic memory raises the possibility that we could harness NK cells to fight viruses. Current projects in the laboratory are focused on better understanding how human NK cells recognize and control infection with HIV-1, influenza, West Nile Virus, and Epstein Barr Virus.

Immune signatures of human pregnancy.

Pregnant women are at increased risk of contracting viruses including HIV and influenza, and are more susceptible to severe complications once infected. A major focus of the laboratory is to define the immune mechanisms that contribute to viral susceptibility in pregnant women. These investigations focus broadly on T cell, antibody, and NK cell responses to viruses during pregnancy, and use infection and vaccination as models. In addition, we are also studying the role of immunity in preterm birth.

CLINICAL TRIALS

- Genetic and Environmental Factors in the Response to Influenza Vaccination, Not Recruiting

Teaching

COURSES

2023-24

- Physician Scientist Hour: INDE 217 (Aut, Win, Spr)

2022-23

- Advanced Immunology II: IMMUNOL 202 (Spr)
- Physician Scientist Hour: INDE 217 (Aut, Win, Spr)

2021-22

- Physician Scientist Hour: INDE 217 (Aut, Win, Spr)

2020-21

- Advanced Immunology II: IMMUNOL 202 (Spr)
- Physician Scientist Hour: INDE 217 (Aut, Win, Spr)

STANFORD ADVISEES

Med Scholar Project Advisor

Anthony Cort

Doctoral Dissertation Reader (AC)

Vincent Liu, Azam Mohsin, Grayson Rodriguez

Postdoctoral Faculty Sponsor

Trisha Barnard, Rebecca Hamlin, Ruoxi Pi

Doctoral Dissertation Advisor (AC)

Leslie Chan, Maigane Diop, Maddie Lee, Kalani Ratnasiri, Sarah Sackey, Xariana Vales Torres, Aaron Wilk, Izumi de los Rios Kobara

Doctoral (Program)

Shannon Choi

Postdoctoral Research Mentor

Rebecca Hamlin, Ruoxi Pi

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biomedical Informatics (Phd Program)
- Cancer Biology (Phd Program)
- Immunology (Phd Program)
- Infectious Diseases (Fellowship Program)
- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **Comparative analysis of cell-cell communication at single-cell resolution.** *Nature biotechnology*
  Wilk, A. J., Shalek, A. K., Holmes, S., Blish, C. A.
  2023

- **SARS-CoV-2 escapes direct NK cell killing through Nsp1-mediated downregulation of ligands for NKG2D.** *Cell reports*
  Lee, M. J., Leong, M. W., Rustagi, A., Beck, A., Zeng, L., Holmes, S., Qi, L. S., Blish, C. A.
  2022: 111892

- **SARS-CoV-2 infection drives an inflammatory response in human adipose tissue through infection of adipocytes and macrophages.** *Science translational medicine*
  Martínez-Colón, G. J., Ratnasiri, K., Chen, H., Jiang, S., Zanley, E., Rustagi, A., Verma, R., Chen, H., Andrews, J. R., Mertz, K. D., Tzankov, A., Azagury, D., Boyd, et al
  2022: eabm9151

- **Multi-omic profiling reveals widespread dysregulation of innate immunity and hematopoiesis in COVID-19.** *The Journal of experimental medicine*
  Wilk, A. J., Lee, M. J., Wei, B., Parks, B., Pi, R., Martinez-Colon, G. J., Ranganath, T., Zhao, N. Q., Taylor, S., Becker, W., Stanford COVID-19 Biobank, Jimenez-Morales, D., Blomkalns, A. L., et al
  2021; 218 (8)

- **A single-cell atlas of the peripheral immune response in patients with severe COVID-19.** *Nature medicine*
  Wilk, A. J., Rustagi, A., Zhao, N. Q., Roque, J., Martinez-Colon, G. J., McKechnie, J. L., Ivison, G. T., Ranganath, T., Vergara, R., Hollis, T., Simpson, L. J., Grant, P., Subramanian, et al
  2020

- **Charge-altering releasable transporters enable phenotypic manipulation of natural killer cells for cancer immunotherapy.** *Blood advances*
  Wilk, A. J., Weidenbacher, N. L., Vergara, R. n., Haabeth, O. A., Levy, R. n., Waymouth, R. M., Wender, P. A., Blish, C. A.
  2020; 4 (17): 4244–55

- **Zika Virus Infection Induces Cranial Neural Crest Cells to Produce Cytokines at Levels Detrimental for Neurogenesis.** *Cell host & microbe*
  Bayless, N. L., Greenberg, R. S., Swigut, T., Wysocka, J., Blish, C. A.
  2016; 20 (4): 423-428

- **Human NK cell repertoire diversity reflects immune experience and correlates with viral susceptibility.** *Science translational medicine*
  Strauss-Albee, D. M., Fukuyama, J., Liang, E. C., Yao, Y., Jarrell, J. A., Drake, A. L., Kinuthia, J., Montgomery, R. R., John-Stewart, G., Holmes, S., Blish, C. A.
  2015; 7 (297): 297ra115-?

- **Enhanced natural killer-cell and T-cell responses to influenza A virus during pregnancy.** *Proceedings of the National Academy of Sciences of the United States of America*
  Kay, A. W., Fukuyama, J., Aziz, N., Dekker, C. L., Mackey, S., Swan, G. E., Davis, M. M., Holmes, S., Blish, C. A.
  2014; 111 (40): 14506-14511

- **Genetic and environmental determinants of human NK cell diversity revealed by mass cytometry.** *Science translational medicine*
  Horowitz, A., Strauss-Albee, D. M., Leipold, M., Kubo, J., Nemat-Gorgani, N., Dogan, O. C., Dekker, C. L., Mackey, S., Maecker, H., Swan, G. E., Davis, M. M., Norman, P. J., Guethlein, et al

2013; 5 (208): 208ra145-?

- **Persistence and free chlorine disinfection of human coronaviruses and their surrogates in water.** *Applied and environmental microbiology*
  Zhang, M., Leong, M. W., Mitch, W. A., Blish, C. A., Boehm, A.
  2024: e0005524

- **An orally bioavailable SARS-CoV-2 main protease inhibitor exhibits improved affinity and reduced sensitivity to mutations.** *Science translational medicine*
  Westberg, M., Su, Y., Zou, X., Huang, P., Rustagi, A., Garhyan, J., Patel, P. B., Fernandez, D., Wu, Y., Hao, C., Lo, C. W., Karim, M., Ning, et al
  2024; 16 (738): eadi0979

- **Pro-inflammatory feedback loops define immune responses to pathogenic Lentivirus infection.** *Genome medicine*
  Wilk, A. J., Marceau, J. O., Kazer, S. W., Fleming, I., Miao, V. N., Galvez-Reyes, J., Kimata, J. T., Shalek, A. K., Holmes, S., Overbaugh, J., Blish, C. A.
  2024; 16 (1): 24

- **Systems immunology of transcriptional responses to viral infection identifies conserved antiviral pathways across macaques and humans.** *Cell reports*
  Ratnasiri, K., Zheng, H., Toh, J., Yao, Z., Duran, V., Donato, M., Roederer, M., Kamath, M., Todd, J. M., Gagne, M., Foulds, K. E., Francica, J. R., Corbett, et al
  2024; 43 (2): 113706

- **IgM N-glycosylation correlates with COVID-19 severity and rate of complement deposition.** *Nature communications*
  Haslund-Gourley, B. S., Woloszczuk, K., Hou, J., Connors, J., Cusimano, G., Bell, M., Taramangalam, B., Fourati, S., Mege, N., Bernui, M., Altman, M. C., Krammer, F., van Bakel, et al
  2024; 15 (1): 404

- **Features of acute COVID-19 associated with post-acute sequelae of SARS-CoV-2 phenotypes: results from the IMPACC study.** *Nature communications*
  Ozonoff, A., Jayavelu, N. D., Liu, S., Melamed, E., Milliren, C. E., Qi, J., Geng, L. N., McComsey, G. A., Cairns, C. B., Baden, L. R., Schaenman, J., Shaw, A. C., Samaha, et al
  2024; 15 (1): 216

- **Charge-altering releasable transporters enhance mRNA delivery in vitro and exhibit in vivo tropism.** *Nature communications*
  Li, Z., Amaya, L., Pi, R., Wang, S. K., Ranjan, A., Waymouth, R. M., Blish, C. A., Chang, H. Y., Wender, P. A.
  2023; 14 (1): 6983

- **Uterine Natural Killer Cells Modulate Endometrial Growth and Persistence in Endometriosis**
  Diop, M., Feyaerts, D., Irwin, J., Einhaus, J., Stelzer, I., Bonham, A., Casillas, A., Vo, K., Blish, C., Giudice, L., Gaudilliere, B.
  ELSEVIER IRELAND LTD.2023: 25

- **Longitudinal clinical phenotyping of post COVID condition in Mexican adults recovering from severe COVID-19: a prospective cohort study.** *Frontiers in medicine*
  Núñez, I., Gillard, J., Fragoso-Saavedra, S., Feyaerts, D., Islas-Weinstein, L., Gallegos-Guzmán, A. A., Valente-García, U., Meyerowitz, J., Kelly, J. D., Chen, H., Ganio, E., Benkendorff, A., Flores-Gouyonnet, et al
  2023; 10: 1236702

- **Defining the role of natural killer cells in COVID-19.** *Nature immunology*
  Lee, M. J., Blish, C. A.
  2023

- **Inferring cell-cell communication at single-cell resolution** *NATURE BIOTECHNOLOGY*
  Wilk, A. J., Blish, C. A.
  2023

- **Disrupted memory T cell expansion in HIV-exposed uninfected infants is preceded by premature skewing of T cell receptor clonality.** *bioRxiv : the preprint server for biology*
  Dzanibe, S., Wilk, A. J., Canny, S., Ranganath, T., Alinde, B., Rubelt, F., Huang, H., Davis, M. M., Holmes, S., Jaspan, H. B., Blish, C. A., Gray, C. M.
  2023

- **Organoid modeling of lung-resident immune responses to SARS-CoV-2 infection.** *Research square*
  Choi, S. S., van Unen, V., Zhang, H., Rustagi, A., Alwahabi, S. A., Santos, A. J., Chan, J. E., Lam, B., Solis, D., Mah, J., Röltgen, K., Trope, W., Guh-Siesel, et al
  2023

- **Autoantibodies are highly prevalent in non-SARS-CoV-2 respiratory infections and critical illness.** *JCI insight*
  Feng, A., Yang, E. Y., Moore, A. R., Dhingra, S., Chang, S. E., Yin, X., Pi, R., Mack, E. K., Völkel, S., Geßner, R., Gündisch, M., Neubauer, A., Renz, et al

2023; 8 (3)

- **A cytometric survey of immune cell populations reveals an association between allergen-responsive natural killer (NK) cells and human peanut allergy**
  Zhou, X., Yu, W., Dunham, D., Schuetz, J., Blish, C., Dekruyff, R., Nadeau, K.
  MOSBY-ELSEVIER.2023: AB117

- **Malaria-driven expansion of adaptive-like functional CD56-negative NK cells correlates with clinical immunity to malaria.** *Science translational medicine*
  Ty, M., Sun, S., Callaway, P. C., Rek, J., Press, K. D., van der Ploeg, K., Nideffer, J., Hu, Z., Klemm, S., Greenleaf, W., Donato, M., Tukwasibwe, S., Arinaitwe, et al
  2023; 15 (680): eadd9012

- **Development of a Definition of Postacute Sequelae of SARS-CoV-2 Infection.** *JAMA*
  Thaweethai, T., Jolley, S. E., Karlson, E. W., Levitan, E. B., Levy, B., McComsey, G. A., McCorkell, L., Nadkarni, G. N., Parthasarathy, S., Singh, U., Walker, T. A., Selvaggi, C. A., Shinnick, et al
  2023

- **Single-cell RNA-seq methods to interrogate virus-host interactions.** *Seminars in immunopathology*
  Ratnasiri, K., Wilk, A. J., Lee, M. J., Khatri, P., Blish, C. A.
  2022

- **Using a 29-mRNA Host Response Classifier To Detect Bacterial Coinfections and Predict Outcomes in COVID-19 Patients Presenting to the Emergency Department.** *Microbiology spectrum*
  Ram-Mohan, N., Rogers, A. J., Blish, C. A., Nadeau, K. C., Zudock, E. J., Kim, D., Quinn, J. V., Sun, L., Liesenfeld, O., Yang, S.
  2022: e0230522

- **Cytometric analysis reveals an association between allergen-responsive natural killer cells and human peanut allergy.** *The Journal of clinical investigation*
  Zhou, X., Yu, W., Dunham, D. M., Schuetz, J. P., Blish, C. A., DeKruyff, R. H., Nadeau, K. C.
  2022; 132 (20)

- **Early immune markers of clinical, virological, and immunological outcomes in patients with COVID-19: a multi-omics study.** *eLife*
  Hu, Z., van der Ploeg, K., Chakraborty, S., Arunachalam, P. S., Mori, D. A., Jacobson, K. B., Bonilla, H., Parsonnet, J., Andrews, J. R., Holubar, M., Subramanian, A., Khosla, C., Maldonado, et al
  2022; 11

- **The human disease gene LYSET is essential for lysosomal enzyme transport and viral infection.** *Science (New York, N.Y.)*
  Richards, C. M., Jabs, S., Qiao, W., Varanese, L. D., Schweizer, M., Mosen, P. R., Riley, N. M., Klüssendorf, M., Zengel, J. R., Flynn, R. A., Rustagi, A., Widen, J. C., Peters, et al
  2022: eabn5648

- **Deconvoluting complex correlates of COVID-19 severity with a multi-omic pandemic tracking strategy.** *Nature communications*
  Parikh, V. N., Ioannidis, A. G., Jimenez-Morales, D., Gorzynski, J. E., De Jong, H. N., Liu, X., Roque, J., Cepeda-Espinoza, V. P., Osoegawa, K., Hughes, C., Sutton, S. C., Youlton, N., Joshi, et al
  2022; 13 (1): 5107

- **Programmable antivirals targeting critical conserved viral RNA secondary structures from influenza A virus and SARS-CoV-2.** *Nature medicine*
  Hagey, R. J., Elazar, M., Pham, E. A., Tian, S., Ben-Avi, L., Bernardin-Souibgui, C., Yee, M. F., Moreira, F. R., Rabinovitch, M. V., Meganck, R. M., Fram, B., Beck, A., Gibson, et al
  2022

- **Phenotypes of disease severity in a cohort of hospitalized COVID-19 patients: Results from the IMPACC study.** *EBioMedicine*
  Ozonoff, A., Schaenman, J., Jayavelu, N. D., Milliren, C. E., Calfee, C. S., Cairns, C. B., Kraft, M., Baden, L. R., Shaw, A. C., Krammer, F., van Bakel, H., Esserman, D. A., Liu, et al
  2022; 83: 104208

- **An intranasal ASO therapeutic targeting SARS-CoV-2.** *Nature communications*
  Zhu, C., Lee, J. Y., Woo, J. Z., Xu, L., Nguyenla, X., Yamashiro, L. H., Ji, F., Biering, S. B., Van Dis, E., Gonzalez, F., Fox, D., Wehri, E., Rustagi, et al
  2022; 13 (1): 4503

- **Genome-wide bidirectional CRISPR screens identify mucins as host factors modulating SARS-CoV-2 infection.** *Nature genetics*
  Biering, S. B., Sarnik, S. A., Wang, E., Zengel, J. R., Leist, S. R., Schafer, A., Sathyan, V., Hawkins, P., Okuda, K., Tau, C., Jangid, A. R., Duffy, C. V., Wei, et al
  2022

- **Anti-nucleocapsid antibody levels and pulmonary comorbid conditions are linked to post-COVID-19 syndrome.** *JCI insight*
  Jia, X., Cao, S., Lee, A. S., Manohar, M., Sindher, S. B., Ahuja, N., Artandi, M., Blish, C. A., Blomkalns, A. L., Chang, I., Collins, W. J., Desai, M., Din, et al
  2022; 7 (13)

- **Broad-spectrum CRISPR-mediated inhibition of SARS-CoV-2 variants and endemic coronaviruses in vitro.** *Nature communications*
  Zeng, L., Liu, Y., Nguyenla, X. H., Abbott, T. R., Han, M., Zhu, Y., Chemparathy, A., Lin, X., Chen, X., Wang, H., Rane, D. A., Spatz, J. M., Jain, et al
  2022; 13 (1): 2766

- **TNF-alpha+ CD4+ Tcells dominate the SARS-CoV-2 specific T cell response in COVID-19 outpatients and are associated with durable antibodies.** *Cell reports. Medicine*
  van der Ploeg, K., Kirosingh, A. S., Mori, D. A., Chakraborty, S., Hu, Z., Sievers, B. L., Jacobson, K. B., Bonilla, H., Parsonnet, J., Andrews, J. R., Press, K. D., Ty, M. C., Ruiz-Betancourt, et al
  2022: 100640

- **Facile discovery of surrogate cytokine agonists.** *Cell*
  Yen, M., Ren, J., Liu, Q., Glassman, C. R., Sheahan, T. P., Picton, L. K., Moreira, F. R., Rustagi, A., Jude, K. M., Zhao, X., Blish, C. A., Baric, R. S., Su, et al
  2022

- **Detection of bacterial co-infections and prediction of fatal outcomes in COVID-19 patients presenting to the emergency department using a 29 mRNA host response classifier.** *medRxiv : the preprint server for health sciences*
  Ram-Mohan, N., Rogers, A. J., Blish, C. A., Nadeau, K. C., Zudock, E. J., Kim, D., Quinn, J. V., Sun, L., Liesenfeld, O., Stanford COVID-19 Biobank Study Group, Yang, S.
  2022

- **Gastrointestinal Perforation in a patient with Anti-nuclear Matrix Protein 2 Antibody Positive Dermatomyositis.** *Arthritis care & research*
  Valenzuela, A., Rieger, K. E., Blish, C. A., Chung, L., Fiorentino, D.
  2022

- **The immunology and immunopathology of COVID-19.** *Science (New York, N.Y.)*
  Merad, M., Blish, C. A., Sallusto, F., Iwasaki, A.
  2022; 375 (6585): 1122-1127

- **Comparative analysis of cell-cell communication at single-cell resolution.** *bioRxiv : the preprint server for biology*
  Wilk, A. J., Shalek, A. K., Holmes, S., Blish, C. A.
  2022

- **Early immune responses have long-term associations with clinical, virologic, and immunologic outcomes in patients with COVID-19.** *Research square*
  Hu, Z., van der Ploeg, K., Chakraborty, S., Arunachalam, P., Mori, D., Jacobson, K., Bonilla, H., Parsonnet, J., Andrews, J., Hedlin, H., de la Parte, L., Dantzler, K., Ty, et al
  2022

- **Autoantibodies targeting cytokines and connective tissue disease autoantigens are common in acute non-SARS-CoV-2 infections.** *Research square*
  Feng, A., Yang, E., Moore, A., Dhingra, S., Chang, S., Yin, X., Pi, R., Mack, E., Völkel, S., Geßner, R., Gundisch, M., Neubauer, A., Renz, et al
  2022

- **Innovative vaccine approaches-a Keystone Symposia report.** *Annals of the New York Academy of Sciences*
  Cable, J., Rappuoli, R., Klemm, E. J., Kang, G., Mutreja, A., Wright, G. J., Pizza, M., Castro, S. A., Hoffmann, J. P., Alter, G., Carfi, A., Pollard, A. J., Krammer, et al
  1800

- **Antibodies elicited by SARS-CoV-2 infection or mRNA vaccines have reduced neutralizing activity against Beta and Omicron pseudoviruses.** *Science translational medicine*
  Sievers, B. L., Chakraborty, S., Xue, Y., Gelbart, T., Gonzalez, J. C., Cassidy, A. G., Golan, Y., Prahl, M., Gaw, S. L., Arunachalam, P. S., Blish, C. A., Boyd, S. D., Davis, et al
  1800: eabn7842

- **Natural Killer Cell Receptors and Ligands Are Associated With Markers of HIV-1 Persistence in Chronically Infected ART Suppressed Patients.** *Frontiers in cellular and infection microbiology*
  Ivison, G. T., Vendrame, E., Martinez-Colon, G. J., Ranganath, T., Vergara, R., Zhao, N. Q., Martin, M. P., Bendall, S. C., Carrington, M., Cyktor, J. C., McMahon, D. K., Eron, J., Jones, et al
  2022; 12: 757846

- **CyTOF analysis identifies unusual immune cells in urine of BCG-treated bladder cancer patients.** *Frontiers in immunology*
  Castellano, E., Samba, C., Esteso, G., Simpson, L., Vendrame, E., Garcia-Cuesta, E. M., Lopez-Cobo, S., Alvarez-Maestro, M., Linares, A., Leibar, A., Ranganath, T., Reyburn, H. T., Martinez-Pineiro, et al
  2022; 13: 970931

- **Deep Phenotypic Analysis of Blood and Lymphoid T and NK Cells From HIV+ Controllers and ART-Suppressed Individuals.** *Frontiers in immunology*
  George, A. F., Luo, X., Neidleman, J., Hoh, R., Vohra, P., Thomas, R., Shin, M., Lee, M. J., Blish, C. A., Deeks, S. G., Greene, W. C., Lee, S. A., Roan, et al
  2022; 13: 803417

- **The B.1.427/1.429 (epsilon) SARS-CoV-2 variants are more virulent than ancestral B.1 (614G) in Syrian hamsters.** *PLoS pathogens*
  Carroll, T., Fox, D., van Doremalen, N., Ball, E., Morris, M. K., Sotomayor-Gonzalez, A., Servellita, V., Rustagi, A., Yinda, C. K., Fritts, L., Port, J. R., Ma, Z. M., Holbrook, et al
  2022; 18 (2): e1009914

- **Association Between SARS-CoV-2 RNAemia and Postacute Sequelae of COVID-19.** *Open forum infectious diseases*
  Ram-Mohan, N., Kim, D., Rogers, A. J., Blish, C. A., Nadeau, K. C., Blomkalns, A. L., Yang, S.
  2022; 9 (2): ofab646

- **Stereotypic Expansion of T Regulatory and Th17 Cells during Infancy Is Disrupted by HIV Exposure and Gut Epithelial Damage.** *Journal of immunology (Baltimore, Md. : 1950)*
  Dzanibe, S., Lennard, K., Kiravu, A., Seabrook, M. S., Alinde, B., Holmes, S. P., Blish, C. A., Jaspan, H. B., Gray, C. M.
  2021

- **The proximal proteome of 17 SARS-CoV-2 proteins links to disrupted antiviral signaling and host translation.** *PLoS pathogens*
  Meyers, J. M., Ramanathan, M., Shanderson, R. L., Beck, A., Donohue, L., Ferguson, I., Guo, M. G., Rao, D. S., Miao, W., Reynolds, D., Yang, X., Zhao, Y., Yang, et al
  2021; 17 (10): e1009412

- **The B.1.427/1.429 (epsilon) SARS-CoV-2 variants are more virulent than ancestral B.1 (614G) in Syrian hamsters.** *bioRxiv : the preprint server for biology*
  Carroll, T., Fox, D., van Doremalen, N., Ball, E., Morris, M. K., Sotomayor-Gonzalez, A., Servellita, V., Rustagi, A., Yinda, C. K., Fritts, L., Port, J. R., Ma, Z., Holbrook, et al
  2021

- **Integrated analysis of multimodal single-cell data.** *Cell*
  Hao, Y., Hao, S., Andersen-Nissen, E., Mauck, W. M., Zheng, S., Butler, A., Lee, M. J., Wilk, A. J., Darby, C., Zager, M., Hoffman, P., Stoeckius, M., Papalexi, et al
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