




## Garry Nolan

Rachford and Carlota Harris Professor

Pathology - Nolan

 NIH Biosketch available Online

 Curriculum Vitae available Online

 Resume available Online

### CONTACT INFORMATION

#### • Administrative Contact

Dyan J. Dalton - Principal Executive Assistant

**Email** [dydalton@stanford.edu](mailto:dydalton@stanford.edu)

### Bio

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#### BIO

Dr. Nolan is the Rachford and Carlota A. Harris Professor in the Department of Pathology at Stanford University School of Medicine. He trained with Leonard Herzenberg (for his Ph.D.) and Nobelist Dr. David Baltimore (for postdoctoral work for the first cloning/characterization of NF- $\kappa$ B p65/ RelA and the development of rapid retroviral production systems). He has published over 350 research articles and is the holder of 50 US patents, and has been honored as one of the top 25 inventors at Stanford University.

Dr. Nolan is the first recipient of the Teal Innovator Award (2012) from the Department of Defense (a \$3.3 million grant for advanced studies in ovarian cancer), the first recipient of an FDA BAAA, for "Bio-agent protection" grant, \$3million, from the FDA for a "Cross-Species Immune System Reference", and received the award for "Outstanding Research Achievement in 2011" from the Nature Publishing Group for his development of CyTOF applications in the immune system. Dr. Nolan has new efforts in the study of Ebola, having developed instrument platforms to deploy in the field in Africa to study Ebola samples safely with the need to transport them to overseas labs (funded by a new \$3.5 million grant from the FDA) and another grant to study the effects of Zika and Ebola viruses on humans (also from the FDA).

Dr. Nolan is an outspoken proponent of translating public investment in basic research to serve the public welfare. Dr. Nolan was the founder of Rigel Inc. (NASDAQ: RIGL), and Nodality, Inc. (a diagnostics development company), BINA (a genomics computational infrastructure company sold to Roche Diagnostics), Founder of Apprise (sold to Roche Sequencing Solutions), co-Founder of Ionpath, co-Founder of Akoya, and serves on the Boards of Directors of several companies as well as consults for other biotechnology companies. DVS Sciences, on which he was Chair of the Scientific Advisory Board, recently sold to Fluidigm for \$207 million dollars (2014) on an investment of \$14 million. Dr. Nolan is a member of the Parker Institute for Cancer Immunotherapy at Stanford.

His areas of research include hematopoiesis, cancer and leukemia, autoimmunity and inflammation, and computational approaches for network and systems immunology. Dr. Nolan's recent efforts are focused on a single cell analysis advance using a mass spectrometry-flow cytometry hybrid device, the so-call "CyTOF" and the "Multiparameter Ion Beam Imager" (MIBI) developed by Dr. Mike Angelo in his lab (Dr. Angelo is now an Assistant Professor in the Dept of Pathology at Stanford). The approaches use an advanced ion plasma source to determine the levels of tagged reagents bound to cells—enabling a vast increase in the number of parameters that can be measured per cell—either as flow cytometry devices (CyTOF) or imaging

platforms for cancer (MIBI). Further efforts with another imaging platform termed CODEX (Akoya, Inc.) that inexpensively converts fluorescence scopes to high dimensional imaging platforms.

Dr. Nolan's efforts are to enable a deeper understanding not only of normal immune function, trauma, pathogen infection, and other inflammatory events but also detailed substructures of leukemias and solid cancers and their interactions with the immune system—which will enable wholly new understandings that will enable better management of disease and clinical outcomes.

## **ACADEMIC APPOINTMENTS**

- Professor, Pathology - Nolan
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

## **ADMINISTRATIVE APPOINTMENTS**

- Director, Stanford NHLBI Proteomics Center, National Heart, Lung, and Blood Institute of the NIH, (2010-2015)
- Board of External Experts, National Heart, Lung, and Blood Institute of the NIH, (2007- present)
- NCI-Frederick Advisory Committee, NCI, (2011-2015)

## **HONORS AND AWARDS**

- Lifetime Achievement Award, Stanford University (2024)
- Keio University Medical Science Prize, Keio University (2022)
- M.D. Anderson Award, M.D. Anderson (2022)
- Hans Sigrist Prize, University of Bern (2021)
- Laboratory Hematology Award, International Society (2021)
- Academy of Clinical Laboratory Physicians & Scientists, Cotlove Award (2015)
- Elected as a Fellow of the American Institute for Medical and Biological Engineering, American Institute (2014 - 2015)
- Teal Innovator Award, Department of Defense (2012-2017)
- Outstanding Research Achievement, for Mass Cytometry and CyTOF, Nature Publishing Group (2011)
- Stohلمان Scholar, Leukemia and Lymphoma Society (2000)
- Howard Hughes Medical Institute Junior Faculty Scholar Award, Stanford University (1997 - 1998)
- Scholar of the Leukemia Society, Leukemia and Lymphoma Society (1996-2000)
- Burrough's Wellcome Investigator's Award In Pharmacology, Burroughs Wellcome (1995-2000)
- Board of Trustees, , Leukemia Society of America, Northern California (1995 - 1998)
- Hume Faculty Scholar, Hume Faculty (1993 - 1998)
- Fellowship, National Institutes of Health (1990 - 1992)
- Organization and Function of the Eukaryotic Genome. Spetsai, Greece., National Science Foundation Fellowship (1988)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- NCI-Frederick Advisory Committee., Frederick (2020 - present)
- National Heart, Lung, and Blood Institute Board of External Experts., NIH (2016 - present)
- Co-Chair, trans-NIH Roadmap Initiative on Cellular Signatures, NIH (2017 - present)

## PROFESSIONAL EDUCATION

- Postdoctoral Fellowship, MIT, David Baltimore Laboratory , Biochemistry (1993)
- Ph.D., Stanford University , Genetics (1989)
- B.S., Cornell University , Genetics (1983)

## PATENTS

- Garry Nolan. "United States Patent 1,166,795,6. Methods of identifying multiple epitopes in cells.", Jun 6, 2023
- Garry Nolan. "United States Patent 1,163,475,2. Kit for split-pool barcoding target molecules that are in or on cells or cell organelles.", Apr 25, 2023
- Garry Nolan. "United States Patent 1,163,475,2. Kit for split-pool barcoding target molecules that are in or on cells or cell organelles.", Apr 25, 2023
- Garry Nolan. "United States Patent 1,163,475,3 On-slide staining by primer extension.", Apr 25, 2023
- Garry Nolan. "United States Patent 1,156,627,8. Methods of identifying multiple epitopes in cells.", Jan 31, 2023
- Garry Nolan. "United States Patent 1,156,058,5. Methods of identifying multiple epitopes in cells.", Jan 24, 2023
- Garry Nolan. "United States Patent 1,129,977,0 On-slide staining by primer extension.", Apr 12, 2022
- Garry Nolan. "United States Patent 1,121,479,4. Increasing dynamic range for identifying multiple epitopes in cells.", Jan 4, 2022
- Garry Nolan. "United States Patent 1,116,835,0 Highly multiplexed fluorescent imaging.", Nov 9, 2021
- Garry Nolan. "United States Patent 1,100,860,8 Multiplexed single molecule RNA visualization with a two-probe proximity ligation system", May 18, 2021
- Garry Nolan. "United States Patent 1,0995,362 Methods of identifying multiple epitopes in cells.", May 4, 2021
- Garry Nolan. "United States Patent 1,098,226,3 On-slide staining by primer extension.", Apr 20, 2021
- Garry Nolan. "United States Patent 1,083,279,5. Compressed sensing for simultaneous measurement of multiple different biological molecule types in a sample", Nov 10, 2020
- Garry Nolan. "United States Patent 1,068,968,7. Detection of target nucleic acids in a cellular sample", Jun 23, 2020
- Garry Nolan. "United States Patent 1,037,069,8. Highly-multiplexed fluorescent imaging.", Aug 6, 2019
- Garry Nolan. "United States Patent 1,028,980,2. Spanning-tree progression analysis of density-normalized events", May 14, 2019
- Garry Nolan. "United States Patent 1,0267,802 Methods of prognosis and diagnosis of ovarian cancer.", Apr 23, 2019
- Garry Nolan. "United States Patent 1,011,400,4. Single cell analysis using secondary ion mass spectrometry.", Oct 30, 2018
- Garry Nolan. "United States Patent 1,004,194,9. Multiplexed imaging of tissues using mass tags and secondary ion mass spectrometry.", Aug 7, 2018
- Garry Nolan. "United States Patent 1,001,780,8. On-slide staining by primer extension.", Jul 10, 2018
- Garry Nolan. "United States Patent 1,000,6082. On-slide straining by primer extension.", Jun 26, 2018
- Garry Nolan. "United States Patent 1,000,079,6 On-slide staining by primer extension.", Jun 19, 2018
- Garry Nolan. "United States Patent 9,909,167 On-slide staining by primer extension.", Mar 6, 2018
- Garry Nolan. "United States Patent 9,783,841 Detection of target nucleic acids in a cellular sample.", Oct 10, 2017
- Garry Nolan. "United States Patent 9,766,224. Single cell analysis using secondary ion mass spectrometry.", Sep 19, 2017
- Garry Nolan. "United States Patent 9,739,765. Metal-based covalent viability reagent for single cell analysis", Aug 22, 2017
- Garry Nolan. "United States Patent 9,312,111. Apparatus and method for sub-micrometer elemental image analysis by mass spectrometry", Apr 12, 2016
- Garry Nolan. "United States Patent 8,945,846 Mutations in the LNK gene in patients with myeloproliferative neoplasms and other hematolymphoid malignancies.", Feb 3, 2015
- Garry Nolan. "United States Patent 8,778,620 Methods for diagnosis, prognosis and methods of treatment.", Jul 15, 2014
- Garry Nolan. "United States Patent 9,500,655 Methods for diagnosis, prognosis and methods of treatment.", May 16, 2014
- Garry Nolan. "United States Patent 1,017,4310 Increasing dynamic range for identifying multiple epitopes in cells.", Aug 8, 2013

- Garry Nolan. "United States Patent 8,227,202 Methods for diagnosis, prognosis and methods of treatment", Jul 24, 2012
- Garry Nolan. "United States Patent 7,939,278 Methods and compositions for risk stratification.", May 10, 2011
- Garry Nolan. "United States Patent 7,695,924 Methods and compositions for detecting receptor-ligand interactions in single cells", Apr 13, 2010
- Garry Nolan. "United States Patent 7,695,926 Methods and compositions for detecting receptor-ligand interactions in single cells.", Apr 13, 2010
- Garry Nolan. "United States Patent 8,309,306 Detection composition", Nov 12, 2009
- Garry Nolan. "United States Patent 7,563,584 Methods and compositions for detecting the activation state of multiple proteins in single cells", Jul 21, 2009
- Garry Nolan. "United States Patent 7,393,656 Methods and compositions for risk stratification.", Jul 1, 2008
- Garry Nolan. "United States Patent 7,381,535 Methods and compositions for detecting receptor-ligand interactions in single cells", Jun 3, 2008
- Garry Nolan. "United States Patent 7,332,356 Fluorescent dye binding peptides", Feb 19, 2008
- Garry Nolan. "United States Patent 8,003,312 Multiplex cellular assays using detectable cell barcodes.", Feb 14, 2008
- Garry Nolan. "United States Patent 6,969,584 Combinatorial enzymatic complexes. Garry P. Nolan and Payan; Donald", Nov 29, 2005
- Garry Nolan. "United States Patent 6,833,245 Methods for screening for transdominant e#ector peptides and RNA molecules", Dec 21, 2004
- Garry Nolan. "United States Patent 6,747,135 Peptide and RNA A#nity-based Fluorophores.", Jun 8, 2004
- Garry Nolan. "United States Patent 6,737,241 Methods for screening for transdominant intracellular e#ector peptides and RNA molecules", May 18, 2004
- Garry Nolan. "United States Patent 6,727,350 Toso, a cell-surface regulator of Fas-induced apoptosis.", Apr 27, 2004
- Garry Nolan. "United States Patent 6,455,247 Methods for screening for transdominant e#ector peptides and RNA molecules.", Sep 24, 2002
- Garry Nolan. "United States Patent 6,365,344 Methods for screening for transdominant e#ector peptides and RNA molecules.", Apr 2, 2002
- Garry Nolan. "United States Patent 6,153,380 Methods for screening for transdominant intracellular e#ector peptides and RNA molecules", Nov 28, 2000
- Garry Nolan. "United States Patent 5,830,725 Rapid, stable high-titer production of recombinant retrovirus", Nov 3, 1998
- Garry Nolan. "United States Patent 5,070,012 Monitoring of cells and trans-activating transcription elements.", Dec 3, 1991

## LINKS

- Nolan Lab: <https://web.stanford.edu/group/nolan/>
- ORCID: <https://orcid.org/0000-0002-8862-9043>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our areas of expertise include signal transduction, immunology, cancer biology, pathogen infection, auto-immunity, retroviral design, bioinformatics and genetics. Our laboratory's recent interests include studying signaling alterations at the single cell level in leukemia and lymphomas, cancer stem cells, and determining which of these signaling attributes correlate with patient outcome, drug reactivity and mechanism of disease progressions.

His areas of research include hematopoiesis, cancer and leukemia, autoimmunity and inflammation, and computational approaches for network and systems immunology. Dr. Nolan's recent efforts are focused on a single cell analysis advance using a mass spectrometry-flow cytometry hybrid device, the so-call "CyTOF" and the "Multiparameter Ion Beam Imager" (MIBI) developed by Dr. Mike Angelo in his lab (Dr. Angelo is now an Assistant Professor in the Dept of Pathology at Stanford). The approaches uses an advanced ion plasma source to determine the levels of tagged reagents bound to cells—enabling a vast increase in the number of parameters that can be measured per cell—either as flow cytometry devices (CyTOF) or imaging platforms for cancer (MIBI). Further efforts are being develop with another imaging platform terms CODEX that inexpensively converts fluorescence scopes to high dimensional imaging platforms.

The lab puts substantial effort into bioinformatics approaches to mine the datasets we collect and to automate the production of network models of the signaling pathways affected. For this, we have collaborations with statisticians, engineering departments, and computer design specialists to extend our efforts to make the program in the laboratory extremely cross-disciplinary.

Dr. Nolan has published over 300 papers, most in top tier journals, has over 40 issued patents, has been cited as one of the top inventors at Stanford, and has a strong record of translating technology and inventions for the public good. Dr. Nolan is the first recipient of the Teal Innovator Award (2012) from the Department of Defense (a \$3.3 million grant for advanced studies in ovarian cancer), the first recipient of an FDA BAAA, for "Bio-agent protection" grant, \$3million, from the FDA for a "Cross-Species Immune System Reference", a recent grant for Ebola studies in Africa (FDA BAAA for \$3.5 million) and received the award for "Outstanding Research Achievement in 2011" from the Nature Publishing Group for his development of CyTOF applications in the immune system. As noted, Dr. Nolan has new efforts in the study of Ebola, having developed instrument platforms to deploy in the field in Africa to study Ebola samples safely with the need to transport them to overseas labs (funded by a new \$3.5 million grant from the FDA).

## CLINICAL TRIALS

- MEK Inhibitor MEK162, Idarubicin, and Cytarabine in Treating Patients With Relapsed or Refractory Acute Myeloid Leukemia, Not Recruiting
- T-cell And General Immune Response to Seasonal Influenza Vaccine (SLVP018) - Year 1, 2009, Not Recruiting
- T-cell And General Immune Response to Seasonal Influenza Vaccine (SLVP018) Year 2, 2010, Not Recruiting
- T-cell And General Immune Response to Seasonal Influenza Vaccine (SLVP018) Year 3, 2011, Not Recruiting
- T-cell And General Immune Response to Seasonal Influenza Vaccine (SLVP018) Year 4, 2012, Not Recruiting
- T-cell And General Immune Response to Seasonal Influenza Vaccine (SLVP018) Year 5, 2013, Not Recruiting

## Teaching

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### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Elizabeth Holman

#### Doctoral Dissertation Advisor (AC)

Timothy Keyes

#### Postdoctoral Research Mentor

Elizabeth Holman

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biomedical Data Science (Masters Program)
- Biomedical Data Science (Phd Program)
- Cancer Biology (Phd Program)
- Immunology (Phd Program)
- Microbiology and Immunology (Phd Program)

## Publications

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### PUBLICATIONS

- **T cell-mediated curation and restructuring of tumor tissue coordinates an effective immune response.** *Cell reports*  
Hickey, J. W., Haist, M., Horowitz, N., Caraccio, C., Tan, Y., Rech, A. J., Baertsch, M. A., Rovira-Clavé, X., Zhu, B., Vazquez, G., Barlow, G., Agmon, E., Goltsev, et al

2023; 42 (12): 113494

- **Integrating Multiplexed Imaging and Multiscale Modeling Identifies Tumor Phenotype Transformation as a Critical Component of Therapeutic T Cell Efficacy.** *bioRxiv : the preprint server for biology*  
Hickey, J. W., Agmon, E., Horowitz, N., Lamore, M., Sunwoo, J., Covert, M., Nolan, G. P.  
2023
- **BCG vaccination stimulates integrated organ immunity by feedback of the adaptive immune response to imprint prolonged innate antiviral resistance.** *Nature immunology*  
Lee, A., Floyd, K., Wu, S., Fang, Z., Tan, T. K., Froggatt, H. M., Powers, J. M., Leist, S. R., Gully, K. L., Hubbard, M. L., Li, C., Hui, H., Scoville, et al  
2023
- **Integration of spatial and single-cell data across modalities with weakly linked features.** *Nature biotechnology*  
Chen, S., Zhu, B., Huang, S., Hickey, J. W., Lin, K. Z., Snyder, M., Greenleaf, W. J., Nolan, G. P., Zhang, N. R., Ma, Z.  
2023
- **CODEX multiplexed tissue imaging** *NATURE REVIEWS IMMUNOLOGY*  
Goltsev, Y., Nolan, G.  
2023
- **CODEX multiplexed tissue imaging.** *Nature reviews. Immunology*  
Goltsev, Y., Nolan, G.  
2023
- **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., Benkendorf, A., Flores-Gouyonnet, et al  
2023; 10: 1236702
- **An atlas of healthy and injured cell states and niches in the human kidney** *NATURE*  
Lake, B. B., Menon, R., Winfree, S., Hu, Q., Ferreira, R., Kalhor, K., Barwinska, D., Otto, E. A., Ferkowicz, M., Diep, D., Plongthongkum, N., Knoten, A., Urata, et al  
2023; 619 (7970): 585+
- **Organ Mapping Antibody Panels: a community resource for standardized multiplexed tissue imaging.** *Nature methods*  
Quardokus, E. M., Saunders, D. C., McDonough, E., Hickey, J. W., Werlein, C., Surette, C., Rajbhandari, P., Casals, A. M., Tian, H., Lowery, L., Neumann, E. K., Björklund, F., Neelakantan, et al  
2023
- **Advances and prospects for the Human BioMolecular Atlas Program (HuBMAP).** *Nature cell biology*  
Jain, S., Pei, L., Spraggins, J. M., Angelo, M., Carson, J. P., Gehlenborg, N., Ginty, F., Gonçalves, J. P., Hagood, J. S., Hickey, J. W., Kelleher, N. L., Laurent, L. C., Lin, et al  
2023
- **Expanded vacuum-stable gels for multiplexed high-resolution spatial histopathology.** *Nature communications*  
Bai, Y., Zhu, B., Oliveria, J., Cannon, B. J., Feyaerts, D., Bosse, M., Vijayaragavan, K., Greenwald, N. F., Phillips, D., Schurch, C. M., Naik, S. M., Ganio, E. A., Gaudilliere, et al  
2023; 14 (1): 4013
- **Organization of the human intestine at single-cell resolution.** *Nature*  
Hickey, J. W., Becker, W. R., Nevins, S. A., Horning, A., Perez, A. E., Zhu, C., Zhu, B., Wei, B., Chiu, R., Chen, D. C., Cotter, D. L., Esplin, E. D., Weimer, et al  
2023; 619 (7970): 572-584
- **MAPS: Pathologist-level cell type annotation from tissue images through machine learning.** *bioRxiv : the preprint server for biology*  
Shaban, M., Bai, Y., Qiu, H., Mao, S., Yeung, J., Yeo, Y. Y., Shanmugam, V., Chen, H., Zhu, B., Nolan, G. P., Shipp, M. A., Rodig, S. J., Jiang, et al  
2023
- **Dasatinib overcomes glucocorticoid resistance in B-cell acute lymphoblastic leukemia.** *Nature communications*  
Sarno, J., Domizi, P., Liu, Y., Merchant, M., Pedersen, C. B., Jedoui, D., Jager, A., Nolan, G. P., Gaipa, G., Bendall, S. C., Bava, F., Davis, K. L.

2023; 14 (1): 2935

- **Physioxia improves the selectivity of hematopoietic stem cell expansion cultures.** *Blood advances*  
Igarashi, K. J., Kucinski, I., Chan, Y. Y., Tan, T., Khoo, H. M., Kealy, D., Bhadury, J., Hsu, I., Ho, P. Y., Niizuma, K., Hickey, J. W., Nolan, G., Bridge, et al  
2023
- **A tissue atlas of ulcerative colitis revealing evidence of sex-dependent differences in disease-driving inflammatory cell types and resistance to TNF inhibitor therapy** *SCIENCE ADVANCES*  
Mayer, A. T., Holman, D. R., Sood, A., Tandon, U., Bhate, S. S., Bodapati, S., Barlow, G. L., Chang, J., Black, S., Crenshaw, E. C., Koron, A. N., Streett, S. E., Gambhir, et al  
2023; 9 (3)
- **A tissue atlas of ulcerative colitis revealing evidence of sex-dependent differences in disease-driving inflammatory cell types and resistance to TNF inhibitor therapy.** *Science advances*  
Mayer, A. T., Holman, D. R., Sood, A., Tandon, U., Bhate, S. S., Bodapati, S., Barlow, G. L., Chang, J., Black, S., Crenshaw, E. C., Koron, A. N., Streett, S. E., Gambhir, et al  
2023; 9 (3): eadd1166
- **A spatial map of human macrophage niches reveals context-dependent macrophage functions in colon and breast cancer.** *Research square*  
Matusiak, M., Hickey, J. W., Luca, B., Lu, G., Kidziński, L., Zhu, S., Colburg, D. R., Phillips, D. J., Brubaker, S. W., Charville, G. W., Shen, J., Nolan, G. P., Newman, et al  
2023
- **Robust single-cell matching and multimodal analysis using shared and distinct features.** *Nature methods*  
Zhu, B., Chen, S., Bai, Y., Chen, H., Liao, G., Mukherjee, N., Vazquez, G., McIlwain, D. R., Tzankov, A., Lee, I. T., Matter, M. S., Goltsev, Y., Ma, et al  
2023
- **Glucose dissociates DDX21 dimers to regulate mRNA splicing and tissue differentiation.** *Cell*  
Miao, W., Porter, D. F., Lopez-Pajares, V., Siprashvili, Z., Meyers, R. M., Bai, Y., Nguyen, D. T., Ko, L. A., Zarnegar, B. J., Ferguson, I. D., Mills, M. M., Jilly-Rehak, C. E., Wu, et al  
2023; 186 (1): 80
- **tidytof: a user-friendly framework for scalable and reproducible high-dimensional cytometry data analysis.** *Bioinformatics advances*  
Keyes, T. J., Koladiya, A., Lo, Y., Nolan, G. P., Davis, K. L.  
2023; 3 (1): vbad071
- **SARS-CoV-2 replication in airway epithelia requires motile cilia and microvillar reprogramming.** *Cell*  
Wu, C., Lidsky, P. V., Xiao, Y., Cheng, R., Lee, I. T., Nakayama, T., Jiang, S., He, W., Demeter, J., Knight, M. G., Turn, R. E., Rojas-Hernandez, L. S., Ye, et al  
2022
- **Highly multiplexed spatial profiling with CODEX: bioinformatic analysis and application in human disease.** *Seminars in immunopathology*  
Kuswanto, W., Nolan, G., Lu, G.  
2022
- **Improved Relapse Prediction in Pediatric Acute Myeloid Leukemia By Deconvolving Lineage-Specific and CancerSpecific Features in Single-Cell Data**  
Keyes, T., Jager, A., Krueger, M., Plevritis, S., Tibshirani, R., Aplenc, R., Nolan, G. P., Redell, M. S., Davis, K. L.  
AMER SOC HEMATOLOGY.2022: 6288-6289
- **Annotation of spatially resolved single-cell data with STELLAR.** *Nature methods*  
Brbic, M., Cao, K., Hickey, J. W., Tan, Y., Snyder, M. P., Nolan, G. P., Leskovec, J.  
2022
- **Predictive models demonstrate age-dependent association of subcortical volumes and cognitive measures.** *Human brain mapping*  
Weerasekera, A., Ion-Margineanu, A., Green, C., Mody, M., Nolan, G. P.  
2022
- **Spatial epitope barcoding reveals clonal tumor patch behaviors.** *Cancer cell*

- Rovira-Clave, X., Drainas, A. P., Jiang, S., Bai, Y., Baron, M., Zhu, B., Dallas, A. E., Lee, M. C., Chu, T. P., Holzem, A., Ayyagari, R., Bhattacharya, D., McCaffrey, et al  
2022
- **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
  - **Immunotherapy of glioblastoma explants induces interferon-gamma responses and spatial immune cell rearrangements in tumor center, but not periphery.** *Science advances*  
Shekarian, T., Zinner, C. P., Bartoszek, E. M., Duchemin, W., Wachnowicz, A. T., Hogan, S., Etter, M. M., Flammer, J., Paganetti, C., Martins, T. A., Schmassmann, P., Zanganeh, S., Le Goff, et al  
2022; 8 (26): eabn9440
  - **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
  - **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
  - **New views of old proteins: clarifying the enigmatic proteome.** *Molecular & cellular proteomics : MCP*  
Burnum-Johnson, K. E., Conrads, T. P., Drake, R. R., Herr, A. E., Iyengar, R., Kelly, R. T., Lundberg, E., MacCoss, M. J., Naba, A., Nolan, G. P., Pevzner, P. A., Rodland, K. D., Sechi, et al  
2022: 100254
  - **Postmitotic G1 phase survivin drives mitogen-independent cell division of B lymphocytes.** *Proceedings of the National Academy of Sciences of the United States of America*  
Singh, A., Spitzer, M. H., Joy, J. P., Kaileh, M., Qiu, X., Nolan, G. P., Sen, R.  
2022; 119 (18): e2115567119
  - **Aldehyde dehydrogenase 3A1 deficiency leads to mitochondrial dysfunction and impacts salivary gland stem cell phenotype.** *PNAS nexus*  
Viswanathan, V., Cao, H., Saiki, J., Jiang, D., Mattingly, A., Nambiar, D., Bloomstein, J., Li, Y., Jiang, S., Chamoli, M., Sirjani, D., Kaplan, M., Holsinger, et al  
2022; 1 (2): pgac056
  - **Combined protein and nucleic acid imaging reveals virus-dependent B cell and macrophage immunosuppression of tissue microenvironments.** *Immunity*  
Jiang, S., Chan, C. N., Rovira-Clave, X., Chen, H., Bai, Y., Zhu, B., McCaffrey, E., Greenwald, N. F., Liu, C., Barlow, G. L., Weirather, J. L., Oliveria, J. P., Nakayama, et al  
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  - **Subcortical Brain Morphometry Differences between Adults with Autism Spectrum Disorder and Schizophrenia.** *Brain sciences*  
Weerasekera, A., Ion-Margineanu, A., Nolan, G., Mody, M.  
2022; 12 (4)
  - **MITI minimum information guidelines for highly multiplexed tissue images.** *Nature methods*  
Schapiro, D., Yapp, C., Sokolov, A., Reynolds, S. M., Chen, Y., Sudar, D., Xie, Y., Muhlich, J., Arias-Camison, R., Arena, S., Taylor, A. J., Nikolov, M., Tyler, et al  
2022; 19 (3): 262-267
  - **A Comprehensive Atlas of Immunological Differences Between Humans, Mice, and Non-Human Primates.** *Frontiers in immunology*  
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