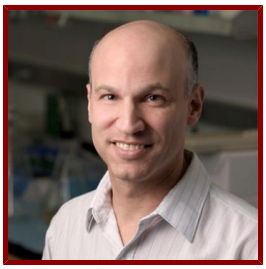
Stanford



Jonathan Pollack

Professor of Pathology

Bio

BIO

Dr. Pollack's research centers on translational genomics, with a major focus on prostate diseases. An original pioneer of array-based comparative genomic hybridization, his early work covered DNA copy number alterations, novel cancer genes, and transcriptional signatures in prostate and breast cancer. His more recent work leverages genomic approaches, together with gene editing and human cell/tissue models, to study benign urologic diseases including benign prostatic hyperplasia (BPH) – the noncancerous prostate enlargement in older men leading to urinary voiding problems often refractory to treatment. Other studies cover rare (neglected) cancer types including ameloblastoma and liposarcoma.

Dr. Pollack was the 2006 recipient of the American Society of Investigative Pathology Amgen Outstanding Investigator Award, a national recognition awarded for research excellence in experimental pathology to an investigator under the age of 45. He is also an Elected Member of the American Society for Clinical Investigation, and has authored over 125 research publications.

Dr. Pollack completed his undergraduate degree at Harvard College, then his MD, PhD (Biochemistry), and clinical pathology residency training at the University of California, San Francisco. Following research fellowship training in genomics at Stanford University, he joined the faculty in 2001. In addition to his research, he has served as founding Director of the Stanford Tissue Bank.

ACADEMIC APPOINTMENTS

- Professor, Pathology
- Member, Bio-X
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Founding Director, Stanford Tissue Bank, (2001-2010)

HONORS AND AWARDS

- Amgen Outstanding Investigator Award, American Society of Investigative Pathology (2006)
- Elected member, American Society for Clinical Investigation (2006)
- Clinical Scientist Award in Translational Research, Burroughs Wellcome Fund (2008)

PROFESSIONAL EDUCATION

- M.D., University of California, San Francisco (1995)
- Ph.D., University of California, San Francisco , Biochemistry (1993)

- A.B., Harvard College , Biological Anthropology (1986)

LINKS

- Pollack Lab Home Page: http://med.stanford.edu/pollacklab.html
- Stanford Center for Urologic Genomics: http://med.stanford.edu/urologicgenomics.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research in the Pollack lab centers on translational genomics, with a focus on prostate diseases. The lab employs next-generation sequencing, single-cell and spatial genomics, gene editing, and human cell/tissue-based modeling to uncover disease mechanisms, biomarkers and therapeutic targets. Current major areas of emphasis include: (1) Determining disease mechanisms and new therapeutic targets in benign prostatic hyperplasia (BPH); (2) Defining molecular features of prostate cancer that distinguish indolent from aggressive disease; and (3) Discovering disease drivers in rare and neglected cancer types (e.g., ameloblastoma, liposarcoma).

Teaching

COURSES

2023-24

- Our Genomes - Vive la Difference!: OSPPARIS 88P (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Isabel Jabara

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (PhD Program)

Publications

PUBLICATIONS

- **Molecular analysis of matched PIN, prostate cancer, and adjacent normal prostate tissue reveals distinct transcriptional signatures and recurrent genomic alterations.** *The Journal of pathology*
  Strand, S. H., Eminaga, O., Kunder, C. A., Rasmussen, M., Qin, X., Rogers, L. W., Vennam, S., Zhu, C., Wang, J., Nolley, R., Varma, S., Kristensen, G. H., Roeder, et al
  2026

- **A Simple Cell Culture Assay for Human Prostatic Branching Morphogenesis Spotlights Bone Morphogenetic Protein Signaling as a Therapeutic Target in Benign Prostatic Hyperplasia.** *The Prostate*
  Pollack, A. S., Brooks, J. D., Pollack, J. R.
  2026

- **Immune repertoire profiling uncovers pervasive T-cell clonal expansions in benign prostatic hyperplasia.** *The Journal of clinical investigation*
  Pollack, A. S., Kunder, C. A., Ho, C. C., Chou, J., Pollack, A. J., Geisick, R. L., Zhang, B. M., West, R. B., Brooks, J. D., Pollack, J. R.
  2025

- **Establishing and characterizing the molecular profiles, cellular features, and clinical utility of a patient-derived xenograft model using benign prostatic tissues.** *Laboratory investigation; a journal of technical methods and pathology*
  Polasko, A. L., Zhang, D., Ramraj, A., Chiu, C. L., Garcia-Marques, F. J., Bermudez, A., Kapp, K., Peterson, E., Qiu, Z., Pollack, A. S., Zhao, H., Pollack, J. R., Pitteri, et al
  2024: 102129

- **AZGP1 deficiency promotes angiogenesis in prostate cancer.** *Journal of translational medicine*
  Wen, R. M., Qiu, Z., Marti, G. E., Peterson, E. E., Marques, F. J., Bermudez, A., Wei, Y., Nolley, R., Lam, N., Polasko, A. L., Chiu, C. L., Zhang, D., Cho, et al
  2024; 22 (1): 383

- **Spatial transcriptomics identifies candidate stromal drivers of benign prostatic hyperplasia.** *JCI insight*
  Pollack, A. S., Kunder, C. A., Brazer, N., Shen, Z., Varma, S., West, R. B., Cunha, G. R., Baskin, L. S., Brooks, J. D., Pollack, J. R.
  2023

- **The retinoic acid receptor co-factor NRIP1 is uniquely upregulated and represents a therapeutic target in acute myeloid leukemia with chromosome 3q rearrangements** *HAEMATOLOGICA*
  Grasedieck, S., Cabantog, A., MacPhee, L., Im, J., Ruess, C., Demir, B., Sperb, N., Ruecker, F. G., Doehner, K., Herold, T., Pollack, J. R., Bullinger, L., Rouhi, et al
  2022; 107 (8): 1758-1772

- **RE: Lower Exome Sequencing Coverage of Ancestrally African Patients in the Cancer Genome Atlas.** *Journal of the National Cancer Institute*
  Mitr, R., Pollack, J. R.
  2022

- **The retinoic acid receptor co-factor NRIP1 is uniquely upregulated and represents a therapeutic target in acute myeloid leukemia with chromosome 3q rearrangements.** *Haematologica*
  Grasedieck, S., Cabantog, A., MacPhee, L., Im, J., Ruess, C., Demir, B., Sperb, N., Rucker, F. G., Dohner, K., Herold, T., Pollack, J. R., Bullinger, L., Rouhi, et al
  2021

- **The long non-coding RNA Cancer Susceptibility 15 (CASC15) is induced by isocitrate dehydrogenase (IDH) mutations and maintains an immature phenotype in adult acute myeloid leukemia.** *Haematologica*
  Grasedieck, S. n., Ruess, C. n., Krowiorz, K. n., Lux, S. n., Pochert, N. n., Schwarzer, A. n., Klusmann, J. H., Jongen-Lavrencic, M. n., Herold, T. n., Bullinger, L. n., Pollack, J. R., Rouhi, A. n., Kuchenbauer, et al
  2020; 105 (9): e448–453

- **Gene Expression Profiling of Head and Neck Tumors Identifies FOXP1 and SOX10 Expression as Useful for Distinguishing Ameloblastoma From Basaloid Salivary Gland Tumors.** *The American journal of surgical pathology*
  Ko, Y. C., Varma, S., Zhu, C. F., Zhu, S. X., Vennam, S., Poh, C. F., Jordan, R. C., Kong, C., Pollack, J. R., West, R. B.
  2019

- **PP2C delta inhibits p300-mediated p53 acetylation via ATM/BRCA1 pathway to impede DNA damage response in breast cancer** *SCIENCE ADVANCES*
  Li, Q., Hao, Q., Cao, W., Li, J., Wu, K., Elshimali, Y., Zhu, D., Chen, Q., Chen, G., Pollack, J. R., Vadgama, J., Wu, Y.
  2019; 5 (10): eaaw8417

- **A common phytoene synthase mutation underlies white petal varieties of the California poppy.** *Scientific reports*
  Pollack, A. J., Gong, X., Pollack, J. R.
  2019; 9 (1): 11615

- **Most canine ameloblastomas harbor HRAS mutations, providing a novel large-animal model of RAS-driven cancer.** *Oncogenesis*
  Saffari, P. S., Vapniarsky, N., Pollack, A. S., Gong, X., Vennam, S., Pollack, A. J., Verstraete, F. J., West, R. B., Arzi, B., Pollack, J. R.
  2019; 8 (2): 11

- **Genomic analysis of benign prostatic hyperplasia implicates cellular re-landscaping in disease pathogenesis.** *JCI insight*
  Middleton, L. W., Shen, Z. n., Varma, S. n., Pollack, A. S., Gong, X. n., Zhu, S. n., Zhu, C. n., Foley, J. W., Vennam, S. n., Sweeney, R. T., Tu, K. n., Biscocho, J. n., Eminaga, et al
  2019; 5

- **The HTN3-MSANTD3 Fusion Gene Defines a Subset of Acinic Cell Carcinoma of the Salivary Gland.** *The American journal of surgical pathology*
  Andreasen, S., Varma, S., Barasch, N., Thompson, L. D., Miettinen, M., Rooper, L., Stelow, E. B., Agander, T. K., Seethala, R. R., Chiosea, S. I., Homoe, P., Wessel, I., Larsen, et al
  2018

- **Identification of Novel Lncrnas That Predict Survival in AML Patients and Modulate Leukemic Cells**

Grasedieck, S., Ruess, C., Pochert, N., Lux, S., Schwarzer, A., Klusmann, J., Jongen-Lavrencic, M., Pollack, J. R., Rouhi, A., Kuchenbauer, F.
AMER SOC HEMATOLOGY.2018

- **XPNPEP3 is a novel transcriptional target of canonical Wnt/-catenin signaling** *GENES CHROMOSOMES & CANCER*
  Kumar, R., Kotapalli, V., Naz, A., Gowrishankar, S., Rao, S., Pollack, J. R., Bashyam, M.
  2018; 57 (6): 304–10

- **Recurrent MSANTD3 Aberrations Defines a Subset of Acinic Cell Carcinomas of the Salivary Gland**
  Andreasen, S., Varma, S., Melchior, L. C., Agander, T. K., Kiss, K., Wessel, I., Homoe, P., Bishop, J., Pollack, J., West, R.
  NATURE PUBLISHING GROUP.2018: 470–71

- **SWI/SNF aberrations sensitize pancreatic cancer cells to DNA crosslinking agents.** *Oncotarget*
  Davidson, J., Shen, Z., Gong, X., Pollack, J. R.
  2018; 9 (11): 9608–17

- **Ca2+/nuclear factor of activated T cells signaling is enriched in early-onset rectal tumors devoid of canonical Wnt activation** *JOURNAL OF MOLECULAR MEDICINE-JMM*
  Kumar, R., Raman, R., Kotapalli, V., Gowrishankar, S., Pyne, S., Pollack, J. R., Bashyam, M. D.
  2018; 96 (2): 135–46

- **Genes co-amplified with ERBB2 or MET as novel potential cancer-promoting genes in gastric cancer** *ONCOTARGET*
  Kwon, M., Kim, R., Song, K., Jeon, S., Jeong, H., Kim, J., Han, J., Hong, S., Oh, E., Choi, J., An, J., Pollack, J. R., Choi, et al
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- **Novel lincRNA SLINKY is a prognostic biomarker in kidney cancer** *ONCOTARGET*
  Gong, X., Siprashvili, Z., Eminaga, O., Shen, Z., Sato, Y., Kume, H., Homma, Y., Ogawa, S., Khavari, P. A., Pollack, J. R., Brooks, J. D.
  2017; 8 (12): 18657-18669

- **Recurrent rearrangements of the Myb/SANT-like DNA-binding domain containing 3 gene (MSANTD3) in salivary gland acinic cell carcinoma.** *PloS one*
  Barasch, N., Gong, X., Kwei, K. A., Varma, S., Biscocho, J., Qu, K., Xiao, N., Lipsick, J. S., Pelham, R. J., West, R. B., Pollack, J. R.
  2017; 12 (2)

- **Loss of Expression of AZGP1 Is Associated With Worse Clinical Outcomes in a Multi-Institutional Radical Prostatectomy Cohort.** *Prostate*
  Brooks, J. D., Wei, W., Pollack, J. R., West, R. B., Shin, J. H., Sunwoo, J. B., Hawley, S. J., Auman, H., Newcomb, L. F., Simko, J., Hurtado-Coll, A., Troyer, D. A., Carroll, et al
  2016; 76 (15): 1409-1419

- **BRAF inhibitor therapy of primary ameloblastoma** *ORAL SURGERY ORAL MEDICINE ORAL PATHOLOGY ORAL RADIOLOGY*
  Tan, S., Pollack, J. R., Kaplan, M. J., Colevas, A., West, R. B.
  2016; 122 (4): 518–19

- **Ameloblastoma: a clinical review and trends in management** *EUROPEAN ARCHIVES OF OTO-RHINO-LARYNGOLOGY*
  McClary, A. C., West, R. B., McClary, A. C., Pollack, J. R., Fischbein, N. J., Holsinger, C. F., Sunwoo, J., Colevas, A. D., Sirjani, D.
  2016; 273 (7): 1649-1661

- **BRAF inhibitor treatment of primary BRAF-mutant ameloblastoma with pathologic assessment of response** *ORAL SURGERY ORAL MEDICINE ORAL PATHOLOGY ORAL RADIOLOGY*
  Tan, S., Pollack, J. R., Kaplan, M. J., Colevas, A. D., West, R. B.
  2016; 122 (1): E5-E7

- **Integrative Genomics Implicates EGFR as a Downstream Mediator in NKX2-1 Amplified Non-Small Cell Lung Cancer** *PLOS ONE*
  Clarke, N., Biscocho, J., Kwei, K. A., Davidson, J. M., Sridhar, S., Gong, X., Pollack, J. R.
  2015; 10 (11)

- **SIRT7 inactivation reverses metastatic phenotypes in epithelial and mesenchymal tumors** *SCIENTIFIC REPORTS*
  Malik, S., Villanova, L., Tanaka, S., Aonuma, M., Roy, N., Berber, E., Pollack, J. R., Michishita-Kioi, E., Chua, K. F.
  2015; 5

- **Identification of recurrent SMO and BRAF mutations in ameloblastomas.** *Nature genetics*

Sweeney, R. T., McClary, A. C., Myers, B. R., Biscocho, J., Neahring, L., Kwei, K. A., Qu, K., Gong, X., Ng, T., Jones, C. D., Varma, S., Odegaard, J. I., Sugiyama, et al
2014; 46 (7): 722-725

- **Evidence for Possible Non-Canonical Pathway(s) Driven Early-Onset Colorectal Cancer in India** *MOLECULAR CARCINOGENESIS*
  Raman, R., Kotapalli, V., Adduri, R., Gowrishankar, S., Bashyam, L., Chaudhary, A., Vamsy, M., Patnaik, S., Srinivasulu, M., Sastry, R., Rao, S., Vasala, A., Kalidindi, et al
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- **Integrative genomic and functional profiling of the pancreatic cancer genome** *BMC GENOMICS*
  Shain, A. H., Salari, K., Giacomini, C. P., Pollack, J. R.
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- **ARID1B, a member of the human SWI/SNF chromatin remodeling complex, exhibits tumour-suppressor activities in pancreatic cancer cell lines** *BRITISH JOURNAL OF CANCER*
  Khursheed, M., Kolla, J. N., Kotapalli, V., Gupta, N., Gowrishankar, S., Uppin, S. G., Sastry, R. A., KOGANTI, S., Sundaram, C., Pollack, J. R., Bashyam, M. D.
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- **EGFRvIII gene rearrangement is an early event in glioblastoma tumorigenesis and expression defines a hierarchy modulated by epigenetic mechanisms.** *Oncogene*
  Del Vecchio, C. A., Giacomini, C. P., Vogel, H., Jensen, K. C., Florio, T., Merlo, A., Pollack, J. R., Wong, A. J.
  2013; 32 (21): 2670-2681

- **Breakpoint analysis of transcriptional and genomic profiles uncovers novel gene fusions spanning multiple human cancer types.** *PLoS genetics*
  Giacomini, C. P., Sun, S., Varma, S., Shain, A. H., Giacomini, M. M., Balagtas, J., Sweeney, R. T., Lai, E., Del Vecchio, C. A., Forster, A. D., Clarke, N., Montgomery, K. D., Zhu, et al
  2013; 9 (4)

- **The Spectrum of SWI/SNF Mutations, Ubiquitous in Human Cancers** *PLOS ONE*
  Shain, A. H., Pollack, J. R.
  2013; 8 (1)

- **Integrative genomic and functional profiling of the pancreatic cancer genome.** *BMC genomics*
  Shain, A. H., Salari, K., Giacomini, C. P., Pollack, J. R.
  2013; 14: 624-?

- **Integrative bioinformatics links HNF1B with clear cell carcinoma and tumor-associated thrombosis.** *PloS one*
  Cuff, J., Salari, K., Clarke, N., Esheba, G. E., Forster, A. D., Huang, S., West, R. B., Higgins, J. P., Longacre, T. A., Pollack, J. R.
  2013; 8 (9)

- **CDX2 is an amplified lineage-survival oncogene in colorectal cancer** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Salari, K., Spulak, M. E., Cuff, J., Forster, A. D., Giacomini, C. P., Huang, S., Ko, M. E., Lin, A. Y., van de Rijn, M., Pollack, J. R.
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  Huang, S., Gulzar, Z. G., Salari, K., Lapointe, J., Brooks, J. D., Pollack, J. R.
  2012; 31 (37): 4164-4170

- **Convergent structural alterations define SWItch/Sucrose NonFermentable (SWI/SNF) chromatin remodeler as a central tumor suppressive complex in pancreatic cancer** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Shain, A. H., Giacomini, C. P., Matsukuma, K., Karikari, C. A., Bashyam, M. D., Hidalgo, M., Maitra, A., Pollack, J. R.
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  Brunner, A. L., Beck, A. H., Edris, B., Sweeney, R. T., Zhu, S. X., Li, R., Montgomery, K., Varma, S., Gilks, T., Guo, X., Foley, J. W., Witten, D. M., Giacomini, et al
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  Nowak, G., Hastie, T., Pollack, J. R., Tibshirani, R.
  2011; 12 (4): 776-791

- **SMURF1 Amplification Promotes Invasiveness in Pancreatic Cancer** *PLOS ONE*
  Kwei, K. A., Shain, A. H., Bair, R., Montgomery, K., Karikari, C. A., van de Rijn, M., Hidalgo, M., Maitra, A., Bashyam, M. D., Pollack, J. R.
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  Malhotra, S., Lapointe, J., Salari, K., Higgins, J. P., Ferrari, M., Montgomery, K., van de Rijn, M., Brooks, J. D., Pollack, J. R.
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- **Comparative Profiling of Primary Colorectal Carcinomas and Liver Metastases Identifies LEF1 as a Prognostic Biomarker** *PLOS ONE*
  Lin, A. Y., Chua, M., Choi, Y., Yeh, W., Kim, Y. H., Azzi, R., Adams, G. A., Sainani, K., van de Rijn, M., So, S. K., Pollack, J. R.
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  Cai, D., Shames, D. S., Raso, M. G., Xie, Y., Kim, Y. H., Pollack, J. R., Girard, L., Sullivan, J. P., Gao, B., Peyton, M., Nanjundan, M., Byers, L., Heymach, et al
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- **Development of an Orthotopic Model of Invasive Pancreatic Cancer in an Immunocompetent Murine Host** *CLINICAL CANCER RESEARCH*
  Tseng, W. W., Winer, D., Kenkel, J. A., Choi, O., Shain, A. H., Pollack, J. R., French, R., Lowy, A. M., Engleman, E. G.
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  2010; 29 (5): 774-779

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  Salari, K., Tibshirani, R., Pollack, J. R.

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- **Molecular Profiling of Breast Cancer Cell Lines Defines Relevant Tumor Models and Provides a Resource for Cancer Gene Discovery** *PLOS ONE*
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  Salari, K., Pollack, J. R.
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  Pollack, J. R.
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  Kim, Y. H., Pollack, J. R.
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- **CAMK1D amplification implicated in epithelial-mesenchymal transition in basal-like breast cancer** *MOLECULAR ONCOLOGY*
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  Sander, S., Bullinger, L., Klapproth, K., Fiedler, K., Kestler, H. A., Barth, T. F., Moeller, P., Stilgenbauer, S., Pollack, J. R., Wirth, T.
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- **Identification of candidate prostate cancer genes through comparative expression-profiling of seminal vesicle** *PROSTATE*
  Thompson, M., Lapointe, J., Choi, Y., Ong, D. E., Higgins, J. P., Brooks, J. D., Pollack, J. R.
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- **Genomic profiling identifies TITF1 as a lineage-specific oncogene amplified in lung cancer** *ONCOGENE*
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