

Stanford



Jean Oak

Clinical Associate Professor, Pathology

CLINICAL OFFICE (PRIMARY)

- **Department of Pathology**

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Bio

BIO

Dr. Oak received her MD and PhD from University of California, Irvine, and completed her anatomic pathology and clinical pathology residency, hematopathology fellowship, and transfusion medicine fellowship at Stanford University. Her research and clinical interests include clinical assay development for tumor immunophenotyping, lymphocyte subset monitoring, and immunotherapy target antigen assessment in a variety of hematologic and immunologic disorders. As director of a clinical flow cytometry laboratory, she oversees the design, validation, and implementation of various immunophenotyping assays in addition to ensuring quality assurance and regulatory compliance for CLIA certification.

CLINICAL FOCUS

- Anatomic and Clinical Pathology
- hematopathology, flow cytometry

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Pathology

ADMINISTRATIVE APPOINTMENTS

- Program Director, Hematopathology Fellowship, Stanford, (2022-2024)
- Section Director, Clinical Flow Cytometry, Stanford Hospital, (2018- present)

PROFESSIONAL EDUCATION

- Medical Education: University of California at Irvine School of Medicine (2010) CA
- Fellowship: Stanford University Hematopathology Fellowship (2016) CA
- Fellowship: Stanford University Pathology Fellowships (2017) CA
- Board Certification: Blood Banking/Transfusion Medicine, American Board of Pathology (2017)
- Board Certification: Hematopathology, American Board of Pathology (2016)
- Residency: Stanford University Department of Pathology (2016) CA

- Board Certification: Anatomic and Clinical Pathology, American Board of Pathology (2015)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Oak received her MD and PhD from University of California, Irvine, and completed her anatomic pathology and clinical pathology residency, hematopathology fellowship, and transfusion medicine fellowship at Stanford University. Her research and clinical interests include clinical assay development for tumor immunophenotyping, lymphocyte subset monitoring, and immunotherapy target antigen assessment in a variety of hematologic and immunologic disorders. As director of a clinical flow cytometry laboratory, she oversees the design, validation, and implementation of various immunophenotyping assays in addition to ensuring quality assurance and regulatory compliance for CLIA certification.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Hematopathology (Fellowship Program)

Publications

PUBLICATIONS

- **Multiparameter flow cytometry of CSF identifies elevated CD8+ effector memory and TEMRA T-cells in immune-mediated neurologic disorders.** *Journal of neuropathology and experimental neurology*
Wu, D., Zhang, S., Jamal, Y. A., Sarkar, T. T., Tomczak, A., Sumera, J., Oak, J., Melamed, E., Nie, E., Galetta, K., McDonald, J., Lock, C., Kipp, et al
2026
- **Immunophenotyping challenges in the diagnosis of NK-LGLL.** *Blood advances*
Wilk, A. J., Oak, J. S., Ames, E.
2026
- **Dynamics of BCMA expression in patients with relapsed/refractory multiple myeloma receiving BCMA-directed CAR-T therapy.** *Blood cancer journal*
Rana, M. S., Fernandez-Pol, S., Jensen, A., Hovanky, V., Velayati, A., Oak, J. S., Silva, O., Ames, E., Muffly, L. S., Sahaf, B., Arai, S., Kennedy, V. E., Bharadwaj, et al
2026
- **TP53 genetic alterations are highly recurrent in Epstein-Barr virus-negative aggressive NK-cell leukemia: insights from an institutional experience and comprehensive literature review.** *American journal of clinical pathology*
Gonzalez Mancera, M., Wilk, A. J., Oak, J., Natkunam, Y., Silva, O.
2026; 165 (4)
- **NKG2C Improves Diagnostic Specificity of NK Cell Receptor Restriction by Identifying Non-Neoplastic Adaptive NK Cell Clones.** *Modern pathology : an official journal of the United States and Canadian Academy of Pathology, Inc*
Wilk, A. J., Gitana, G., Oak, J.
2026: 100984
- **Pre-treatment CD19 antigen density and multi-antigen profiling by calibrated quantitative flow cytometry correlates with CAR T efficacy in LBCL**
Spiegel, J., Oak, J., Rana, M., Jensen, A., Lee, D., Nguyen-Mau, S., Kong, K., Bornheimer, S., Mikkilineni, L., Muffly, L., Sidana, S., Weng, W., Bharadwaj, et al
ELSEVIER.2025: 5882-5883
- **A practical approach to panel design, validation, and interpretation for the evaluation of T-cell neoplasms by flow cytometry.** *Cytometry. Part B, Clinical cytometry*
Oak, J., Furtado, F. M., Devitt, K. A., Horna, P., Fromm, J. R., Qiu, L., Illingworth, A., Cardinali, J., Kern, W., Al-Attar, A., Shi, M.
2025

- **Real time machine learning prediction of next generation sequencing test results in live clinical settings.** *NPJ digital medicine*
Kim, G. Y., Schwede, M., Corbin, C. K., Fouladvand, S., Brar, R., Iberri, D., Shomali, W., Oak, J. S., Gratzinger, D., Stehr, H., Chen, J. H.
2025; 8 (1): 533
- **C1C-Rearrangements in Pediatric Acute Erythroid Leukemia/Erythroblastic Sarcoma.** *Pediatric blood & cancer*
Chang-Graham, A. L., Nguyen, T., Oak, J., Silva, O., Gruber, T. A.
2025: e31848
- **Automation of flow cytometry data analysis with elastic image registration.** *Scientific reports*
Irvine, A., Moustafa, M. M., Patel, S., Patel, A., Hardardottir, L., Delvecchio, F., Foreman, T., Oak, J., Bornheimer, S. J., Cimbro, R.
2025; 15 (1): 16949
- **Implementation of beaker CP for flow cytometry: Workflow optimization and integration at Stanford Health Care.** *Cytometry. Part B, Clinical cytometry*
Oak, J., Gitana, G., Wei, S., Parry, M., Tan, B.
2025
- **Prognostic Significance of CD123 Expression in Acute Myeloid Leukemia Treated with Venetoclax and Hypomethylating Agents**
Tiu, B. C., Su, C. J., St Martin, E. C., Oak, J. S., Zhang, T. Y., Mannis, G. N.
ELSEVIER.2024: 6104-6105
- **Quantification of the median fluorescence intensity of CD3 and CD4 in mycosis fungoides/Sezary syndrome versus non-neoplastic control cases in peripheral blood.** *Journal of hematopathology*
Fei, F., Brar, N., Herring, M. B., Menke, J. R., Oak, J., Fernandez-Pol, S.
2024
- **CD22-directed CAR T-cell therapy for large B-cell lymphomas progressing after CD19-directed CAR T-cell therapy: a dose-finding phase 1 study.** *Lancet (London, England)*
Frank, M. J., Baird, J. H., Kramer, A. M., Srinagesh, H. K., Patel, S., Brown, A. K., Oak, J. S., Younes, S. F., Natkunam, Y., Hamilton, M. P., Su, Y. J., Agarwal, N., Chinnasamy, et al
2024
- **Prevalence and clinicopathological features of incidentally detected TRBC1-dim populations in peripheral blood flow cytometry.** *Leukemia & lymphoma*
Wadsworth, P., Zhang, J., Miller, T., Menke, J., Oak, J., Fernandez-Pol, S.
2024: 1-4
- **TRBC1 in flow cytometry: Assay development, validation, and reporting considerations.** *Cytometry. Part B, Clinical cytometry*
Devitt, K. A., Kern, W., Li, W., Wang, X., Wong, A. J., Furtado, F. M., Oak, J. S., Illingworth, A.
2024
- **Circulating lobular breast carcinoma cells.** *International journal of laboratory hematology*
Tan, B., Oak, J.
2024
- **p53 immunohistochemistry as an ancillary tool for rapid assessment of residual disease in TP53-mutated acute myeloid leukemia and myelodysplastic syndromes.** *American journal of clinical pathology*
Brar, N., Lawrence, L., Fung, E., Zehnder, J. L., Greenberg, P. L., Mannis, G. N., Zhang, T. Y., Gratzinger, D., Oak, J., Silva, O., Kurzer, J., Tan, B., Menke, et al
2024
- **B-lymphoblastic leukemia with transient spontaneous remission in the setting of severe group A streptococcus infection.** *Journal of hematopathology*
Gilbert, A., Tan, J., Nadimpalli, S., Orkusyan, R., Fernandez, Z. I., Oak, J., Fernandez-Pol, S.
2023; 16 (4): 223-226
- **Antigen density quantification of cell-surface immunotherapy targets by flow cytometry: Multi-antigen assay of neuroblastoma bone marrow metastasis.** *STAR protocols*
Radosevich, M. T., Bornheimer, S. J., Mehrpouryan, M., Sahaf, B., Oak, J. S., Mackall, C. L., Heitzeneder, S.
2023; 4 (4): 102709

- **Targeting of CD25+Activated T Cells in Gvhd-Associated Marrow Suppression and Cytopenias**
John, T. D., Valine, L., Barbarito, G., Kwon, H., Arai, S., Martin-Kool, B., Kumari, R., Shizuru, J., Oak, J. S., Parkman, R., Bertaina, A., Weinberg, K. I.
AMER SOC HEMATOLOGY.2023
- **B-lymphoblastic leukemia with transient spontaneous remission in the setting of severe group A streptococcus infection** *JOURNAL OF HEMATOPATHOLOGY*
Gilbert, A., Tan, J., Nadimpalli, S., Orkusyan, R., Fernandez, Z., Oak, J., Fernandez-Pol, S.
2023
- **A cell-level discriminative neural network model for diagnosis of blood cancers.** *Bioinformatics (Oxford, England)*
Robles, E. E., Jin, Y., Smyth, P., Scheuermann, R. H., Bui, J. D., Wang, H. Y., Oak, J., Qian, Y.
2023
- **Challenges of detecting measurable/minimal disease in acute leukemia.** *Seminars in diagnostic pathology*
Zhang, J., Oak, J.
2023
- **Role of peripheral blood MRD and 18F-FDG PET in the post-CAR relapse setting: a case study of discordant peripheral blood and bone marrow MRD.** *Journal for immunotherapy of cancer*
Schultz, L., Davis, K. L., Walkush, A., Baggott, C., Erickson, C., Ramakrishna, S., Aftandilian, C., Lacayo, N., Nadel, H. R., Oak, J., Mackall, C. L.
2023; 11 (2)
- **Determinants of resistance to engineered T cell therapies targeting CD19 in large B cell lymphomas.** *Cancer cell*
Sworder, B. J., Kurtz, D. M., Alig, S. K., Frank, M. J., Shukla, N., Garofalo, A., Macaulay, C. W., Shahrokh Esfahani, M., Olsen, M. N., Hamilton, J., Hosoya, H., Hamilton, M., Spiegel, et al
2022
- **Determinants of Resistance to Engineered T-Cell Therapies Targeting CD19 in Large B-Cell Lymphomas**
Sworder, B., Kurtz, D. M., Alig, S. K., Frank, M. J., Shukla, N. D., Garofalo, A., Macaulay, C., Esfahani, M., Olsen, M., Hamilton, J., Hosoya, H., Hamilton, M. P., Spiegel, et al
AMER SOC HEMATOLOGY.2022: 1301-1303
- **Characterization of Clinical, Molecular, and Prognostic Features of the WHO 2022 Classification System for Myelodysplastic Neoplasms (MDS)**
Khanna, V., Lu, R., Kumar, J., Stehr, H., Spinner, M. A., Silva, O., Fernandez-Pol, S., Oak, J. S., Tan, B., Greenberg, P. L.
AMER SOC HEMATOLOGY.2022: 6955-6957
- **Correlation of Mutational Profiles and Cytogenetics with Morphologic Dysplasia in Myelodysplastic Syndromes**
Kumar, J., Khanna, V., Lu, R., Stehr, H., Spinner, M. A., Silva, O., Fernandez-Pol, S., Oak, J. S., Greenberg, P. L., Tan, B.
AMER SOC HEMATOLOGY.2022: 4053-4055
- **Targeted Mutational Profiling Reveals Clonal Relationships in Metachronous Occurrence of Classic Hodgkin and Mediastinal Large B-Cell Lymphomas.** *The American journal of surgical pathology*
Singh, K., Lezama, L. S., Kurzer, J., Oak, J., Schultz, L. M., Walkush, A., Cheng, T. C., Chen, E. H., May, W. A., Chang, C., Link, M. P., Advani, R. H., Suarez, et al
2022
- **CD22-CAR T-Cell Therapy Mediates High Durable Remission Rates in Adults with Large B-Cell Lymphoma Who Have Relapsed after CD19-CAR T-Cell Therapy**
Frank, M. J., Baird, J. H., Patel, S., Craig, J., Spiegel, J. Y., Ehlinger, Z., Chinnasamy, H., Younes, S. F., Oak, J. S., Natkunam, Y., Reynolds, W. D., Iglesias, M., Crawford, et al
AMER SOC HEMATOLOGY.2021
- **CAR T cells with dual targeting of CD19 and CD22 in adult patients with recurrent or refractory B cell malignancies: a phase 1 trial.** *Nature medicine*
Spiegel, J. Y., Patel, S., Muffly, L., Hossain, N. M., Oak, J., Baird, J. H., Frank, M. J., Shiraz, P., Sahaf, B., Craig, J., Iglesias, M., Younes, S., Natkunam, et al
2021
- **Detection of cryptogenic malignancies from metagenomic whole genome sequencing of body fluids.** *Genome medicine*
Gu, W., Talevich, E., Hsu, E., Qi, Z., Urisman, A., Federman, S., Gopez, A., Arevalo, S., Gottschall, M., Liao, L., Tung, J., Chen, L., Lim, et al

2021; 13 (1): 98

- **Machine Learning Predictability of Clinical Next Generation Sequencing for Hematologic Malignancies to Guide High-Value Precision Medicine.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
Kim, G. Y., Noshad, M., Stehr, H., Rojansky, R., Gratzinger, D., Oak, J., Brar, R., Iberri, D., Kong, C., Zehnder, J., Chen, J. H.
2021; 2021: 641-650
- **In-depth B cell immunophenotyping to monitor response to anti-CD20 therapy in CNS autoimmunity.** *Multiple sclerosis and related disorders*
Su, E., Wetzel, N. S., Oak, J., Kipp, L., Han, M. H.
2020; 46: 102594
- **Two Cases With Features of Lymphocyte Variant Hypereosinophilic Syndrome With STAT3 SH2 Domain Mutations.** *The American journal of surgical pathology*
Fernandez-Pol, S., Petersen, B., Murphy, J., Oak, J. S., Wang, E. B., Rieger, K. E., Kim, Y. H., Khodadoust, M. S., Suarez, C. J.
2020
- **Identification of dual positive CD19+/CD3+ T cells in a leukapheresis product undergoing CAR transduction: a case report.** *Journal for immunotherapy of cancer*
Schultz, L., Patel, S., Davis, K. L., Ramakrishna, S., Sahaf, B., Bhatia, N., Baggott, C., Erickson, C., Majzner, R. G., Oak, J., Bertaina, A., Mackall, C., Feldman, et al
2020; 8 (2)
- **Disseminated Pneumocystis jirovecii Infection with Osteomyelitis in a Patient with CTLA-4 Haploinsufficiency.** *Journal of clinical immunology*
Siddiqi, A. E., Liu, A. Y., Charville, G. W., Kunder, C. A., Uzel, G. n., Sadighi Akha, A. A., Oak, J. n., Martin, B. n., Sacha, J. n., Lewis, D. B., Gemez, Y. n.
2020
- **Multiplexed single-cell morphometry for hematopathology diagnostics.** *Nature medicine*
Tsai, A. G., Glass, D. R., Juntilla, M. n., Hartmann, F. J., Oak, J. S., Fernandez-Pol, S. n., Ohgami, R. S., Bendall, S. C.
2020; 26 (3): 408–17
- **CD22-Directed CAR T-Cell Therapy Induces Complete Remissions in CD19-Directed CAR-Refractory Large B-Cell Lymphoma.** *Blood*
Baird, J. H., Frank, M. J., Craig, J. n., Patel, S. n., Spiegel, J. Y., Sahaf, B. n., Oak, J. S., Younes, S. n., Ozawa, M. n., Yang, E. n., Natkunam, Y. n., Tamaresis, J. S., Ehlinger, et al
2020
- **Histology-Independent Signature Distinguishes Kikuchi-Fujimoto Disease/Systemic Lupus Erythematosus-Associated Lymphadenitis From Benign and Malignant Lymphadenopathies.** *American journal of clinical pathology*
Scott, G. D., Kumar, J. n., Oak, J. S., Boyd, S. D., Raess, P. W., Gratzinger, D. A.
2020
- **Identification of Dual Positive CD19+/CD3+T Cells in an Apheresis Product Undergoing Chimeric Antigen Receptor (CAR) Transduction**
Schultz, L. M., Patel, S., Ramakrishna, S., Bertaina, A., Bhatia, N., Oak, J., Majzner, R. G., Baggott, C., Davis, K. L., Mackall, C. L., Feldman, S. A.
AMER SOC HEMATOLOGY.2019
- **Flow Cytometry Signature for Kikuchi-Fujimoto/Lupus Lymphadenitis Derived From 975 Benign and Malignant Lymphadenopathies**
Kumar, J., Scott, G., Oak, J., Raess, P., Gratzinger, D.
OXFORD UNIV PRESS INC.2019: S105–S106
- **Rationale and Feasibility of Using a Standardized Screening Tube on the FACSCanto II and the FACSLytic**
Jackson, R., Oak, J., Kurzer, J.
NATURE PUBLISHING GROUP.2019
- **Circulating DNA for Molecular Response Prediction, Characterization of Resistance Mechanisms and Quantification of CAR T-Cells during Axicabtagene Ciloleucef Therapy** *American Society of Hematology*
Sworder, B., Kurtz, D. M., Macaulay, C., Frank, M. J., Alig, S., Garofalo, A., Sahaf, B., Esfahani, M. S., Spiegel, J. Y., Oak, J., Beygi, S., Jin, M. C., Chabon, et al
2019
- **Target Antigen Downregulation and Other Mechanisms of Failure after Axicabtagene Ciloleucef (CAR19) Therapy**
Oak, J., Spiegel, J. Y., Sahaf, B., Natkunam, Y., Long, S. R., Hossain, N., Mackall, C. L., Kong, K. A., Miklos, D. B.

AMER SOC HEMATOLOGY.2018

- **Phase I Experience with a Bi-Specific CAR Targeting CD19 and CD22 in Adults with B-Cell Malignancies**
Hossain, N., Sahaf, B., Abramian, M., Spiegel, J. Y., Kong, K., Kim, S., Mavroukakis, S., Oak, J., Natkunam, Y., Meyer, E. H., Frank, M. J., Feldman, S. A., Long, et al
AMER SOC HEMATOLOGY.2018
- **Elevated Axicabtagene Ciloleuce (CAR-19) Expansion By Immunophenotyping Is Associated with Toxicity in Diffuse Large B-Cell Lymphoma**
Spiegel, J. Y., Sahaf, B., Hossain, N., Frank, M. J., Claire, G., Abramian, M., Latchford, T., Villa, B., Cancilla, J., Oak, J., Natkunam, Y., Long, S. R., Arai, et al
AMER SOC HEMATOLOGY.2018
- **A reevaluation of erythroid predominance in Acute Myeloid Leukemia using the updated WHO 2016 Criteria** *MODERN PATHOLOGY*
Margolskee, E., Mikita, G., Rea, B., Bagg, A., Zuo, Z., Sun, Y., Goswami, M., Wang, S. A., Oak, J., Arber, D. A., Allen, M., George, T. I., Rogers, et al
2018; 31 (6): 873–80
- **Occult Hemolytic Anemia Due to Anti-Mur in a Patient Receiving Blood from a Region with a Prominent Asian Donor Population**
Oak, J., Mallari, R., de Asis, M., Shu, E., Hughes, J., Pham, T.
WILEY.2017: 178A
- **Myelodysplastic Syndrome, Unclassifiable (MDS-U) With 1% Blasts Is a Distinct Subgroup of MDS-U With a Poor Prognosis** *AMERICAN JOURNAL OF CLINICAL PATHOLOGY*
Margolskee, E., Hasserjian, R. P., Hassane, D., Tam, W., Mathew, S., Ok, C., Wang, S. A., Oak, J., Arber, D. A., Orazi, A.
2017; 148 (1): 49–57
- **Oligomonocytic chronic myelomonocytic leukemia (chronic myelomonocytic leukemia without absolute monocytosis) displays a similar clinicopathologic and mutational profile to classical chronic myelomonocytic leukemia.** *Modern pathology*
Geyer, J. T., Tam, W., Liu, Y., Chen, Z., Wang, S. A., Bueso-Ramos, C., Oak, J., Arber, D. A., Hsi, E., Rogers, H. J., Levinson, K., Bagg, A., Hassane, et al
2017
- **Focusing on frequent ASXL1 mutations in myeloid neoplasms, and considering rarer ASXL2 and ASXL3 mutations.** *Current medical research and opinion*
Oak, J. S., Ohgami, R. S.
2017: 1-2
- **c-Myc Protein Expression Distinguishes Plasma Cell Myeloma from Solitary Plasmacytoma and Is Associated with Aggressive Morphologic Features**
Oak, J., Raess, P. W., Foley, C., Ohgami, R., Cascio, M.
NATURE PUBLISHING GROUP.2017: 368A
- **A Retrospective Study of 305 Cases of Angioimmunoblastic T-Cell Lymphoma with Emphasis on Rare Lymphoplasmacytic and Plasma Cell Proliferations**
Oak, J., Hoffmann, J. C., Chisholm, K. M., Chen, J., Zehnder, J., Arber, D. A., Natkunam, Y., Warnke, R., Ohgami, R.
NATURE PUBLISHING GROUP.2017: 367A–368A
- **Acute Myeloid Leukemia with Erythroid Predominance: Are All Cases MDS-Related?**
Margolskee, E., Mikita, G., Oak, J., Allen, M. B., Zuo, Z., Wang, S., Arber, D. A., George, T., Hasserjian, R. P., Orazi, A.
NATURE PUBLISHING GROUP.2017: 362A
- **Myelodysplastic Syndrome, Unclassifiable (MDS-U) with 1% Blasts Is a Distinct Subgroup of MDS-U with a Poor Prognosis**
Margolskee, E., Oak, J., Arber, D. A., Hasserjian, R. P., Orazi, A.
NATURE PUBLISHING GROUP.2016: 361A