



David Kurtz

Assistant Professor of Medicine (Oncology)

Medicine - Oncology

CLINICAL OFFICES

- **Medical Oncology**

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ACADEMIC CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

My research focuses on developing and translating genomic technologies in oncology. Specifically, I focus on methods for detecting, monitoring, and studying malignancies from cell-free DNA, with a particular emphasis on non-Hodgkin lymphomas (NHLs), lung cancer, as well as other tumor types. I aim to create tools to rapidly detect and quantify tumors and their response to chemotherapy and immunotherapy, thereby enabling personalized therapies. Toward this end, I utilize tools from a wide range of disciplines, including bioengineering, computational biology, and medical oncology. I have developed and implemented multiple next generation sequencing approaches for detection of circulating tumor DNA (ctDNA) in lymphomas, including immunoglobulin high-throughput sequencing and targeted approaches such as Cancer Personalized Profiling by Deep Sequencing (CAPP-Seq). This research has directly led to the translation of ctDNA into the clinic in multiple ongoing novel clinical trial paradigms.

In addition to development of novel molecular biology tools, I also have interest in developing tools to utilize liquid biopsies for clinically relevant applications. An example of this is the Continuous Individualized Risk Index, or CIRI, a novel computational technique to dynamically determine outcome probabilities for individual patients utilizing risk-predictors acquired over time. CIRI demonstrated improved outcome prediction across several cancer types as well as the ability to predict specific subgroups of patients who would benefit from targeted therapies, suggesting utility in precision diagnostics. Additionally, I and others developed the Cancer Likelihood in Plasma, or CLiP method, a novel molecular biology and computational approach to leverage diverse features of cell-free DNA sequencing for non-invasive cancer screening. By applying CLiP to patients undergoing radiographic screening for lung cancer (Lung-CLiP), we demonstrated high sensitivity and specificity for detection of lung cancer in patients, including those with small early-stage tumors.

My ongoing research is currently focused on applying tumor and cell-free DNA sequencing toward understanding mechanisms of disease response and resistance in diverse malignancies, including lymphomas, lung cancer, and other hematologic neoplasms. I am additionally developing new technologies to detect alternative genetic and epigenetic tumor features from liquid biopsies, including sensitive detection of copy number alterations, gene expression inferences, and tumor heterogeneity deconvolution.

CLINICAL FOCUS

- Medical Oncology
- Lymphoma

ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Medicine - Oncology
- Member, Stanford Cancer Institute

HONORS AND AWARDS

- Physician-Scientist Training Award, Damon Runyon Cancer Research Foundation (2016-2018)
- Åke Bertil Eriksson Endowed Young Investigator Award, ASCO Conquer Cancer Foundation (2016)
- Lymphoma Clinical Research Mentoring Program Scholar, Lymphoma Research Foundation (2014)

PROFESSIONAL EDUCATION

- PhD, Stanford University , Bioengineering (2018)
- Fellowship: Stanford University Hematology and Oncology Fellowship (2018) CA
- Board Certification: Medical Oncology, American Board of Internal Medicine (2016)
- Board Certification: Internal Medicine, American Board of Internal Medicine (2012)
- Residency: Stanford University Internal Medicine Residency (2011) CA
- Medical Education: Mayo Clinic School of Medicine (2009) MN

LINKS

- Kurtz Lab: <https://med.stanford.edu/kurtzlab.html>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Implementation of noninvasive detection of malignancies in the clinic remains difficult due to both technical and clinical challenges. These include necessary improvements in sensitivity and specificity of biomarkers, as well as demonstration of clinical utility of these assays. My research focuses on technical development and implementation of assays to detect and track cancers in order to facilitate personalized disease management. This includes development of methods to detect non-Hodgkin lymphoma through circulating tumor DNA (ctDNA), as well as defining the clinical utility of this assay. My current research is focused on utilizing ctDNA to answer clinically relevant questions, enabling personalized treatment paradigms.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Hematology (Fellowship Program)
- Oncology (Fellowship Program)

Publications

PUBLICATIONS

- **Enhanced detection of minimal residual disease by targeted sequencing of phased variants in circulating tumor DNA.** *Nature biotechnology*
Kurtz, D. M., Soo, J., Co Ting Keh, L., Alig, S., Chabon, J. J., Sworder, B. J., Schultz, A., Jin, M. C., Scherer, F., Garofalo, A., Macaulay, C. W., Hamilton, E. G., Chen, et al
2021

- **The landscape of tumor cell states and ecosystems in diffuse large B cell lymphoma.** *Cancer cell*
Steen, C. B., Luca, B. A., Esfahani, M. S., Azizi, A., Sworder, B. J., Nabet, B. Y., Kurtz, D. M., Liu, C. L., Khameneh, F., Advani, R. H., Natkunam, Y., Myklebust, J. H., Diehn, et al
2021
- **A mathematical model of ctDNA shedding predicts tumor detection size.** *Science advances*
Avanzini, S., Kurtz, D. M., Chabon, J. J., Moding, E. J., Hori, S. S., Gambhir, S. S., Alizadeh, A. A., Diehn, M., Reiter, J. G.
2020; 6 (50)
- **Integrating genomic features for non-invasive early lung cancer detection.** *Nature*
Chabon, J. J., Hamilton, E. G., Kurtz, D. M., Esfahani, M. S., Moding, E. J., Stehr, H., Schroers-Martin, J., Nabet, B. Y., Chen, B., Chaudhuri, A. A., Liu, C. L., Hui, A. B., Jin, et al
2020; 580 (7802): 245-251
- **Dynamic Risk Profiling Using Serial Tumor Biomarkers for Personalized Outcome Prediction.** *Cell*
Kurtz, D. M., Esfahani, M. S., Scherer, F., Soo, J., Jin, M. C., Liu, C. L., Newman, A. M., Duhrsen, U., Huttmann, A., Casasnovas, O., Westin, J. R., Ritgen, M., Bottcher, et al
2019
- **Prognostication with circulating tumor DNA: is it ready for prime time?** *Hematology. American Society of Hematology. Education Program*
Kurtz, D. M.
2019; 2019 (1): 47-52
- **Circulating Tumor DNA Measurements As Early Outcome Predictors in Diffuse Large B-Cell Lymphoma.** *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*
Kurtz, D. M., Scherer, F., Jin, M. C., Soo, J., Craig, A. F., Esfahani, M. S., Chabon, J. J., Stehr, H., Liu, C. L., Tibshirani, R., Maeda, L. S., Gupta, N. K., Khodadoust, et al
2018: JCO2018785246
- **Distinct biological subtypes and patterns of genome evolution in lymphoma revealed by circulating tumor DNA** *SCIENCE TRANSLATIONAL MEDICINE*
Scherer, F., Kurtz, D. M., Newman, A. M., Stehr, H., Craig, A. F., Esfahani, M. S., Lovejoy, A. F., Chabon, J. J., Klass, D. M., Liu, C. L., Zhou, L., Glover, C., Visser, et al
2016; 8 (364)
- **Integrated digital error suppression for improved detection of circulating tumor DNA** *NATURE BIOTECHNOLOGY*
Newman, A. M., Lovejoy, A. F., Klass, D. M., Kurtz, D. M., Chabon, J. J., Scherer, F., Stehr, H., Liu, C. L., Bratman, S. V., Say, C., Zhou, L., Carter, J. N., West, et al
2016; 34 (5): 547-555
- **Noninvasive monitoring of diffuse large B-cell lymphoma by immunoglobulin high-throughput sequencing.** *Blood*
Kurtz, D. M., Green, M. R., Bratman, S. V., Scherer, F., Liu, C. L., Kunder, C. A., Takahashi, K., Glover, C., Keane, C., Kihira, S., Visser, B., Callahan, J., Kong, et al
2015; 125 (24): 3679-3687
- **Inferring gene expression from cell-free DNA fragmentation profiles.** *Nature biotechnology*
Esfahani, M. S., Hamilton, E. G., Mehrmohamadi, M., Nabet, B. Y., Alig, S. K., King, D. A., Steen, C. B., Macaulay, C. W., Schultz, A., Nesselbush, M. C., Soo, J., Schroers-Martin, J. G., Chen, et al
2022
- **The many facets of liquid biopsies in lymphoma.** *Blood*
Kurtz, D. M.
2022; 139 (12): 1780-1781
- **CD20-Targeted Therapy Ablates De Novo Antibody Response to Vaccination but Spares Pre-Established Immunity.** *Blood cancer discovery*
Shree, T., Shankar, V., Lohmeyer, J. J., Czerwinski, D. K., Schroers-Martin, J. G., Rodriguez, G. M., Beygi, S., Kanegai, A. M., Corbelli, K. S., Gabriel, E., Kurtz, D. M., Khodadoust, M. S., Gupta, et al
2022
- **Circulating Tumor DNA in Lymphoma: Principles and Future Directions.** *Blood cancer discovery*
Roschewski, M., Rossi, D., Kurtz, D. M., Alizadeh, A. A., Wilson, W. H.
1800; 3 (1): 5-15

- **A comprehensive circulating tumor DNA assay for detection of translocation and copy number changes in pediatric sarcomas.** *Molecular cancer therapeutics*
Shah, A. T., Azad, T. D., Breese, M. R., Chabon, J. J., Hamilton, E. G., Straessler, K., Kurtz, D. M., Leung, S. G., Spillinger, A., Liu, H., Behroozfard, I. H., Wittber, F. M., Hazard, et al
2021
- **Phased variants improve DLBCL minimal residual disease detection at the end of therapy.**
Kurtz, D., Chabon, J. J., Soo, J., Keh, L., Alig, S., Schultz, A., Jin, M. C., Scherer, F., Craig, A. M., Liu, C., Duehrsen, U., Huettmann, A., Casasnovas, et al
LIPPINCOTT WILLIAMS & WILKINS.2021
- **Investigating gene expression profiles associated with clinical radiation resistance in KEAP1/NFE2L2 wildtype lung cancer.**
Binkley, M. S., Jeon, Y., Nesselbush, M., Moding, E. J., Nabet, B., Almanza, D., Yoo, C., Kurtz, D. M., Owen, S., Backhus, L. M., Berry, M. F., Shrager, J. B., Ramchandran, et al
AMER ASSOC CANCER RESEARCH.2021
- **Bringing circulating tumor DNA to the clinic in Hodgkin lymphoma.** *Haematologica*
Kurtz, D. M.
2021; 106 (1): 5–6
- **Short Diagnosis-to-Treatment Interval Is Associated With Higher Circulating Tumor DNA Levels in Diffuse Large B-Cell Lymphoma.** *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*
Alig, S. n., Macaulay, C. W., Kurtz, D. M., Dührsen, U. n., Hüttmann, A. n., Schmitz, C. n., Jin, M. C., Sworder, B. J., Garofalo, A. n., Shahrokh Esfahani, M. n., Nabet, B. Y., Soo, J. n., Scherer, et al
2021: JCO2002573
- **Liquid biopsy in lymphoma: Molecular methods and clinical applications.** *Cancer treatment reviews*
Cirillo, M., Craig, A. F., Borchmann, S., Kurtz, D. M.
2020; 91: 102106
- **Chromatin accessibility patterns in cell-free DNA reveal tumor heterogeneity**
Esfahani, M., Mehrmohamadi, M., Steen, C. B., Hamilton, E. G., King, D. A., Soo, J., Macaulay, C., Jin, M., Kurtz, D. M., Nabet, B., Moding, E., Chabon, J., Newman, et al
AMER ASSOC CANCER RESEARCH.2020
- **ctDNA shedding dynamics dictate early lung cancer detection potential**
Avanzini, S., Kurtz, D. M., Chabon, J. J., Hori, S. S., Alizadeh, A. A., Diehn, M., Reiter, J. G.
AMER ASSOC CANCER RESEARCH.2020: 25
- **KEAP1/NFE2L2 mutations to predict local recurrence after radiotherapy but not surgery in localized non-small cell lung cancer.**
Binkley, M. S., Jeon, Y., Nesselbush, M., Moding, E. J., Nabet, B., Almanza, D. S., Yoo, C., Kurtz, D., Owen, S., Backhus, L., Berry, M. F., Shrager, J. B., Ramchandran, et al
AMER SOC CLINICAL ONCOLOGY.2020
- **Integrating genomic features for non-invasive early lung cancer detection** *NATURE*
Chabon, J. J., Hamilton, E. G., Kurtz, D. M., Esfahani, M. S., Moding, E. J., Stehr, H., Schroers-Martin, J., Nabet, B. Y., Chen, B., Chaudhuri, A. A., Liu, C., Hui, A. B., Jin, et al
2020
- **KEAP1/NFE2L2 mutations predict lung cancer radiation resistance that can be targeted by glutaminase inhibition.** *Cancer discovery*
Binkley, M. S., Jeon, Y. J., Nesselbush, M. n., Moding, E. J., Nabet, B. Y., Almanza, D. n., Kunder, C. n., Stehr, H. n., Yoo, C. H., Rhee, S. n., Xiang, M. n., Chabon, J. J., Hamilton, et al
2020
- **Prognostication with circulating tumor DNA: is it ready for prime time?**
Kurtz, D. M.
AMER SOC HEMATOLOGY.2019: 47–52
- **Changes in circulating tumor DNA levels are associated with treatment response and progression-free survival in relapse/refractory DLBCL subjects.**
Lovejoy, A. F., Lin, H., Tabari, E., Saelee, S., Kurtz, D., Vitazka, P., Morschhauser, F., Chu, Y., Szafer-Glusman, E., Venstrom, J., Luong, K., Klass, D. M.
AMER SOC CLINICAL ONCOLOGY.2019

- **Reply to J. Wang et al.** *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*
Kurtz, D. M., Scherer, F., Jin, M. C., Soo, J., Craig, A. F., Esfahani, M. S., Chabon, J. J., Stehr, H., Liu, C. L., Tibshirani, R., Maeda, L. S., Gupta, N. K., Khodadoust, et al
2019; JCO1801907
- **The Development of Liquid Biopsy for Research and Clinical Practice in Lymphomas: Report of the 15-ICML Workshop on ctDNA.** *Hematological oncology*
Rossi, D. n., Kurtz, D. M., Roschewski, M. n., Cavalli, F. n., Zucca, E. n., Wilson, W. H.
2019
- **Circulating tumor DNA analysis for detection of minimal residual disease after chemoradiotherapy for localized esophageal cancer.** *Gastroenterology*
Azad, T. D., Chaudhuri, A. A., Fang, P. n., Qiao, Y. n., Esfahani, M. S., Chabon, J. J., Hamilton, E. G., Yang, Y. D., Lovejoy, A. n., Newman, A. M., Kurtz, D. M., Jin, M. n., Schroers-Martin, et al
2019
- **Lymphoma Virome Dynamics Revealed By Cell-Free DNA Sequencing**
Schroers-Martin, J. G., Garofalo, A., Soo, J., Jin, M. C., Kurtz, D. M., Buedts, L., Duehrsen, U., Huettmann, A., Cottreau, A., Meignan, M., Casasnovas, O., Westin, J. R., Gaidano, et al
AMER SOC HEMATOLOGY.2018
- **Distinct Chromatin Accessibility Profiles of Lymphoma Subtypes Revealed By Targeted Cell Free DNA Profiling**
Mehrmohamadi, M., Esfahani, M. S., Soo, J., Scherer, F., Schroers-Martin, J. G., Chen, B., Kurtz, D. M., Hamilton, E., Liu, C., Diehn, M., Alizadeh, A. A.
AMER SOC HEMATOLOGY.2018
- **Noninvasive Genotyping and Monitoring of Classical Hodgkin Lymphoma**
Jin, M. C., Schroers-Martin, J. G., Kurtz, D. M., Buedts, L., Esfahani, M. S., Macaulay, C., Sworder, B., Soo, J., Glover, C., Roschewski, M., Wilson, W. H., Duhrsen, U., Huettmann, et al
AMER SOC HEMATOLOGY.2018
- **Early detection of molecular residual disease in localized lung cancer by circulating tumor DNA profiling.** *Cancer discovery*
Chaudhuri, A. A., Chabon, J. J., Lovejoy, A. F., Newman, A. M., Stehr, H. n., Azad, T. D., Khodadoust, M. S., Esfahani, M. S., Liu, C. L., Zhou, L. n., Scherer, F. n., Kurtz, D. M., Say, et al
2017
- **High-throughput sequencing for noninvasive disease detection in hematologic malignancies.** *Blood*
Scherer, F. n., Kurtz, D. M., Diehn, M. n., Alizadeh, A. A.
2017; 130 (4): 440-52
- **Molecular profiling of single circulating tumor cells from lung cancer patients** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Park, S., Wong, D. J., Ooi, C. C., Kurtz, D. M., Vermesh, O., Aalipour, A., Suh, S., Pian, K. L., Chabon, J. J., Lee, S. H., Jamali, M., Say, C., Carter, et al
2016; 113 (52): E8379-E8386
- **Circulating tumour DNA profiling reveals heterogeneity of EGFR inhibitor resistance mechanisms in lung cancer patients** *NATURE COMMUNICATIONS*
Chabon, J. J., Simmons, A. D., Lovejoy, A. F., Esfahani, M. S., Newman, A. M., Haringsma, H. J., Kurtz, D. M., Stehr, H., Scherer, F., Karlovich, C. A., Harding, T. C., Durkin, K. A., Otterson, et al
2016; 7
- **Organocatalytic removal of formaldehyde adducts from RNA and DNA bases.** *Nature chemistry*
Karmakar, S., Harcourt, E. M., Hewings, D. S., Scherer, F., Lovejoy, A. F., Kurtz, D. M., Ehrenschrwender, T., Barandun, L. J., Roost, C., Alizadeh, A. A., Kool, E. T.
2015; 7 (9): 752-758
- **Organocatalytic removal of formaldehyde adducts from RNA and DNA bases** *NATURE CHEMISTRY*
Karmakar, S., Harcourt, E. M., Hewings, D. S., Lovejoy, A. F., Kurtz, D. M., Ehrenschrwender, T., Barandun, L. J., Roost, C., Alizadeh, A. A., Kool, E. T.
2015; 7 (9): 752-758
- **Next-generation surveillance strategies for patients with lymphoma.** *Future oncology*
Cohen, J. B., Kurtz, D. M., Staton, A. D., Flowers, C. R.
2015; 11 (13): 1977-1991

- **Tracking Cellular and Immune Therapies in Cancer** *EMERGING APPLICATIONS OF MOLECULAR IMAGING TO ONCOLOGY*
Kurtz, D. M., Gambhir, S. S.
2014; 124: 257-296
- **Tracking cellular and immune therapies in cancer.** *Advances in cancer research*
Kurtz, D. M., Gambhir, S. S.
2014; 124: 257-296