

Stanford



Florette K. Gray Hazard

Associate Professor of Pathology and of Pediatrics

CLINICAL OFFICES

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Bio

CLINICAL FOCUS

- Pediatric Pathology
- Anatomic and Clinical Pathology

ACADEMIC APPOINTMENTS

- Associate Professor - University Medical Line, Pathology
- Associate Professor - University Medical Line, Pediatrics
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Vice Chair for Professional Development and Diversity, Department of Pathology, (2021- present)
- Medical Director and Chief of Anatomic and Clinical Pathology Service, Lucile Packard Children's Hospital Stanford / Stanford Children's Health, (2018- present)
- Program Director, Pediatric Pathology Fellowship, Stanford University School of Medicine, (2018- present)
- Director, Pediatric Surgical Pathology, (2008- present)

PROFESSIONAL EDUCATION

- Medical Education: Georgetown University School of Medicine (2002) DC
- Fellowship: Stanford University Surgical Pathology Fellowship (2007) CA
- Residency: Stanford University Pathology Residency (2006) CA

- Fellowship: Childrens Hospital of Philadelphia Pediatric Pathology (2008) PA
- Board Certification: Anatomic and Clinical Pathology, American Board of Pathology (2007)
- Board Certification: Pediatric Pathology, American Board of Pathology (2011)
- --, Children's Hosp of Philadelphia , Pediatric Pathology Fellowship (2008)
- --, Stanford University , Surgical Pathology Fellowship (2007)
- --, Stanford University , Anatomic and Clinical Pathology Residency (2006)
- --, Stanford University , Anatomic and Clinical Pathology Internship (2003)
- M.D., Georgetown University , Medicine (2002)
- B.A., Princeton University , Ecology and Evolutionary Biology (1997)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My scholarly pursuits are primarily focused on the study of death and disease in the pediatric population. Most notably to characterize pediatric tumor pathology, evaluate abnormalities of the juvenile reproductive system, demonstrate the histologic and ultrastructural changes of metabolic disorders on specific organs, and elucidate new scientific techniques to aid in the study of childhood disease.

1. Ovarian Surface Epithelial Neoplasms:

Ovarian cancer is the fifth most common cause of malignancy in adult women; with those involving the surface epithelium of the ovary being the most common. In stark contrast, ovarian neoplasms account for approximately 1% of all childhood malignancies with those affecting the epithelium being extraordinarily rare. It is partially due to their low frequency that little is known about the overall incidence, histologic subtypes, optimal treatment strategies, and natural history of ovarian surface epithelial neoplasms in children.

2. Liver Pathology in Mitochondrial DNA Depletion Syndrome:

Mitochondrial disorders are rare causes of childhood disease and dysfunction. Syndromes caused by depletion of mitochondrial DNA (mtDNA) are exceptionally rare, but can often cause devastating outcomes. These depletion syndromes are caused by anomalous mtDNA or nuclear DNA encoding for mitochondrial proteins resulting in a quantitative reduction in mtDNA and abnormal oxidative phosphorylation. To date, three genes have been implicated in this process MPV17, polymerase gamma, and deoxyguanosine kinase. In neonates, these abnormalities most often manifest with hepatic and neurologic dysfunction; the hepatocerebral phenotype. Recognition of the clinical signs and symptoms of mitochondrial DNA depletion coupled with the histologic and ultrastructural features can result in early diagnosis and optimal treatment.

3. Liver Explant Pathology In Argininosuccinate Lyase Deficiency:

Argininosuccinate (ASA) lyase deficiency is the second most common urea cycle disorder in the pediatric population. It manifests in either a neonatal or late onset form with seizures, lethargy, and often hyperammonemia. Due to the risk of cognitive impairment, children are closely followed by monitoring serum ammonia levels and treated with arginine supplementation, dietary restriction, and recently liver transplantation. Characterization of the histologic features of livers in children with ASA lyase deficiency will aid pathologists in providing prompt diagnoses and allow clinicians to impart early therapy before the onset of life threatening complications and cognitive impairment.

4. Tissue Microarray Analysis of Small Volume Cellular Suspensions:

The use of small volume tissue samples in tissue microarray analysis has been plagued by inefficiency and poor reproducibility. Therefore, tissue samples such as cerebrospinal fluid, pleural fluid, bone marrow aspirates, and fine needle aspirates are often excluded from scientific research. A new technique developed by a team of

researchers at Stanford University School of Medicine has made utilization of these low volume tissue samples possible. In fact, this technique can be used to establish diagnoses and confirm other ancillary testing results, such as gene expression arrays.

CLINICAL TRIALS

- Development of Radiation Free Whole Body Magnetic Resonance (MR) Imaging Technique for Staging Children With Cancer, Recruiting
- Efficacy Study of Preconception Treatment of an Asymptomatic Bacterial Infection in an Infertility Population, Not Recruiting

Publications

PUBLICATIONS

- **Test yourself question: 7-month-old female with an enlarging left axillary mass.** *Skeletal radiology*
Guja, K. E., Hazard, F. K., Fadell, M.
2022
- **The Use of Fluorescence in situ Hybridization to Confirm PRKACA Gene Rearrangement in Fibrolamellar Hepatocellular Carcinoma: A Validation Study.** *Annals of clinical and laboratory science*
Weiel, J. J., Forgo, B., Sage, J., Rangaswami, A., Hazard, F. K.
2022; 52 (3): 475-483
- **Juvenile granulosa cell tumor associated with Ollier disease.** *Skeletal radiology*
Littrell, L. A., Inwards, C. Y., Hazard, F. K., Wenger, D. E.
2022
- **Next-Generation Sequencing as an Auxiliary Tool in Pediatric Laryngeal Lymphoma Diagnosis.** *Pediatrics*
Munjal, T., Vukkadala, N., Hazard, F. K., Meister, K. D.
2021
- **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
- **Composite Neuroblastoma Metastatic to a Lymph Node: The Novel Histopathologic Diagnosis of a Unique Multiclonal Neoplasm** *ANNALS OF CLINICAL AND LABORATORY SCIENCE*
Kurtz, J. L., Shimada, H., Hazard, F. K.
2021; 51 (4): 573-579
- **Composite Neuroblastoma Metastatic to a Lymph Node: The Novel Histopathologic Diagnosis of a Unique Multiclonal Neoplasm.** *Annals of clinical and laboratory science*
Kurtz, J. L., Shimada, H., Hazard, F. K.
2021; 51 (4): 573-579
- **Multimodality treatment including whole pleura radiation therapy for DICER1-associated pediatric pleuropulmonary blastoma.** *Pediatric blood & cancer*
Hui, C., Shin, D. H., Wakeling, A., Donaldson, S. S., Hazard, F. K., Rangaswami, A., Hiniker, S. M.
2021: e29004
- **Sclerosing Epithelioid Fibrosarcoma of the Kidney: First Reported Case in a Young Child.** *Pediatric and developmental pathology : the official journal of the Society for Pediatric Pathology and the Paediatric Pathology Society*
Kurtz, J. L., Tan, S. Y., Hazard, F. K.
2021: 1093526620977738
- **Stage 4S Neuroblastoma: Molecular, Histologic, and Immunohistochemical Characteristics and Presence of 2 Distinct Patterns of MYCN Protein Overexpression-A Report From the Children's Oncology Group.** *The American journal of surgical pathology*
Kawano, A., Hazard, F. K., Chiu, B., Naranjo, A., LaBarre, B., London, W. B., Hogarty, M. D., Cohn, S. L., Maris, J. M., Park, J. R., Gastier-Foster, J. M., Ikegaki, N., Shimada, et al
2020

- **ALK-positive compound Spitz nevus with extensive perineural and intraneural neurotropism.** *Journal of cutaneous pathology*
Brown, R. A., Wang, J. Y., Raghavan, S. S., Zhang, J., Wan, D. C., Born, D., Koo, M., Hazard, F. K., Novoa, R. A., Rieger, K. E.
2020
- **Integrative analysis of whole-genome and RNA sequencing in high-risk pediatric malignancies**
Shah, A. T., Breese, M. R., Lee, A. G., Martell, H. J., Tanasa, B., Leung, S. G., Spillingeer, A., Liu, H., Behroozfard, I., Phuong Dinh, Hazard, F. K., Cho, S., Rangaswami, A., et al
AMER ASSOC CANCER RESEARCH.2020: 90–91
- **The Role of the Clinical Laboratory in the Diagnosis of Neuroblastoma** *JOURNAL OF APPLIED LABORATORY MEDICINE*
Hazard, F. K., Shimada, H.
2020; 5 (2): 254–56
- **EPIGENETIC TARGETING OF TERT-ASSOCIATED GENE EXPRESSION SIGNATURE IN HUMAN NEUROBLASTOMA WITH TERT OVEREXPRESSION.** *Cancer research*
Huang, M. n., Zeki, J. n., Sumarsono, N. n., Coles, G. L., Taylor, J. S., Danzer, E. n., Bruzoni, M. n., Hazard, F. K., Lacayo, N. J., Sakamoto, K. M., Dunn, J. C., Spunt, S. L., Chiu, et al
2020
- **Impact of a deep learning assistant on the histopathologic classification of liver cancer.** *NPJ digital medicine*
Kiani, A. n., Uyumazturk, B. n., Rajpurkar, P. n., Wang, A. n., Gao, R. n., Jones, E. n., Yu, Y. n., Langlotz, C. P., Ball, R. L., Montine, T. J., Martin, B. A., Berry, G. J., Ozawa, et al
2020; 3: 23
- **Impact of a deep learning assistant on the histopathologic classification of liver cancer.** *NPJ digital medicine*
Kiani, A. n., Uyumazturk, B. n., Rajpurkar, P. n., Wang, A. n., Gao, R. n., Jones, E. n., Yu, Y. n., Langlotz, C. P., Ball, R. L., Montine, T. J., Martin, B. A., Berry, G. J., Ozawa, et al
2020; 3 (1): 23
- **Differentiation of benign and malignant lymph nodes in pediatric patients on ferumoxytol-enhanced PET/MRI** *THERANOSTICS*
Muehe, A., Siedek, F., Theruvath, A., Seekins, J., Spunt, S. L., Pribnow, A., Hazard, F., Liang, T., Daldrup-Link, H.
2020; 10 (8): 3612–21
- **Three Infants with Pathogenic Variants in the ABCA3 Gene: Presentation, Treatment and Clinical Course.** *The Journal of pediatrics*
Si, n. n., X, n. n., Steffes, n. n., L C, n. n., Schymick, n. n., J C, n. n., Hazard, n. n., F K, n. n., Tracy, n. n., M C, n. n., Cornfield, n. n., D N, n. n.
2020
- **Pathological overlap of Arrhythmogenic Right Ventricular Cardiomyopathy and Cardiac Sarcoidosis.** *Circulation. Genomic and precision medicine*
Kerker, A., Hazard, F., Caleshu, C. A., Shah, R. L., Reuter, C., Ashley, E. A., Parikh, V. N.
2019
- **Integrative analysis of whole-genome and RNA sequencing in high-risk pediatric malignancies**
Breese, M. R., Shah, A. T., Lee, A. G., Tanasa, B., Leung, S. G., Spillingeer, A., Liu, H., Behroozfard, I., Phuong Dinh, Hazard, F. K., Rangaswami, A., Spunt, S. L., Lacayo, N. J., et al
AMER ASSOC CANCER RESEARCH.2019
- **Delayed appearance of mature ganglia in an infant with an atypical presentation of total colonic and small bowel aganglioneurosis: a case report.** *BMC pediatrics*
Salimi Jazi, F., Chandler, J. M., Thorson, C. M., Sinclair, T. J., Hazard, F. K., Kerner, J. A., Dutta, S., Dunn, J. C., Chao, S. D.
2019; 19 (1): 93
- **Tumor Formation of Adult Stem Cell Transplants in Rodent Arthritic Joints** *MOLECULAR IMAGING AND BIOLOGY*
Chapelin, F., Khurana, A., Moneeb, M., Hazard, F., Chan, C., Nejadnik, H., Gratzinger, D., Messing, S., Erdmann, J., Gaur, A., Daldrup-Link, H. E.
2019; 21 (1): 95–104
- **Comparative RNA-seq analysis aids in diagnosis of a rare pediatric tumor.** *Cold Spring Harbor molecular case studies*
Sanders, L. M., Rangaswami, A. n., Bjork, I. n., Lam, D. L., Beale, H. C., Kephart, E. T., Durbin, A. n., Learned, K. n., Currie, R. n., Lyle, A. G., Pfeil, J. n., Shah, A. T., Lee, et al
2019; 5 (5)
- **Adrenal Incidentaloma: Challenges in Diagnosing Adrenal Myelolipoma.** *Journal of investigative medicine high impact case reports*

- Adapa, S., Naramala, S., Gayam, V., Gavini, F., Dhingra, H., Hazard, F. K., Aeddula, N. R., Konala, V. M.
2019; 7: 2324709619870311
- **Obstetric and neonatal outcomes in pregnancies complicated by fetal lung masses: does final histology matter?** *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians*
Anderson, J. N., Girsen, A. I., Hintz, S. R., El-Sayed, Y. Y., Davis, A. S., Barth, R. A., Halabi, S. n., Hazard, F. K., Sylvester, K. G., Bruzoni, M. n., Blumenfeld, Y. J.
2019: 1–7
 - **Genome-Informed Targeted Therapy for Osteosarcoma** *CANCER DISCOVERY*
Sayles, L. C., Breese, M. R., Koehne, A. L., Leung, S. G., Lee, A. G., Liu, H., Spillinger, A., Shah, A. T., Tanasa, B., Straessler, K., Hazard, F. K., Spunt, S. L., Marina, et al
2019; 9 (1): 46–63
 - **OncoKids A Comprehensive Next-Generation Sequencing Panel for Pediatric Malignancies** *JOURNAL OF MOLECULAR DIAGNOSTICS*
Hiemenz, M. C., Ostrow, D. G., Busse, T. M., Buckley, J., Maglinte, D. T., Bootwalla, M., Done, J., Ji, J., Raca, G., Ryutov, A., Xu, X., Zhen, C., Conroy, et al
2018; 20 (6): 765–76
 - **Integrative analysis of whole-genome and RNA sequencing in high-risk pediatric malignancies**
Breese, M. R., Shah, A. T., Tanasa, B., Lee, A. G., Leung, S. G., Spillinger, A., Liu, H., Hazard, F. K., Sweet-Cordero, A.
AMER ASSOC CANCER RESEARCH.2018
 - **Genome-Informed Targeted Therapy for Osteosarcoma.** *Cancer discovery*
Sayles, L. C., Breese, M. R., Koehne, A. L., Leung, S. G., Lee, A. G., Liu, H., Spillinger, A., Shah, A. T., Tanasa, B., Straessler, K., Hazard, F. K., Spunt, S. L., Marina, et al
2018
 - **Magnetic Resonance Imaging of Tumor-Associated Macrophages: Clinical Translation** *CLINICAL CANCER RESEARCH*
Aghighi, M., Theruvath, A. J., Pareek, A., Pisani, L. L., Alford, R., Muehe, A. M., Sethi, T. K., Holdsworth, S. J., Hazard, F. K., Gratzinger, D., Luna-Fineman, S., Advani, R., Spunt, et al
2018; 24 (17): 4110–18
 - **Tumor Formation of Adult Stem Cell Transplants in Rodent Arthritic Joints.** *Molecular imaging and biology : MIB : the official publication of the Academy of Molecular Imaging*
Chapelin, F. n., Khurana, A. n., Moneeb, M. n., Gray Hazard, F. K., Chan, C. F., Nejadnik, H. n., Gratzinger, D. n., Messing, S. n., Erdmann, J. n., Gaur, A. n., Daldrup-Link, H. E.
2018
 - **CD47 is not Over-Expressed in Fibrolamellar Hepatocellular Carcinoma** *ANNALS OF CLINICAL AND LABORATORY SCIENCE*
Cooney, T., Wei, M. C., Rangaswami, A., Xu, L., Sage, J., Hazard, F. K.
2017; 47 (4): 395–402
 - **Mesenteric lipoma simulating an ovarian teratoma** *JOURNAL OF PEDIATRIC SURGERY CASE REPORTS*
Deshmukh, S., Hazard, F. K., Mueller, C. M.
2017; 21: 36–38
 - **Hepatoblastoma Arising in a Pigmented β -catenin-activated Hepatocellular Adenoma: Case Report and Review of the Literature.** *American journal of surgical pathology*
Louie, C. Y., Concepcion, W., Park, J. K., Rangaswami, A., Finegold, M. J., Hazard, F. K.
2016; 40 (7): 998-1003
 - **Synchronous Hepatoblastoma, Neuroblastoma, and Cutaneous Capillary Hemangiomas: A Case Report.** *Pediatric and developmental pathology*
Ozawa, M. G., Cooney, T., Rangaswami, A., Hazard, F. K.
2016; 19 (1): 74-79
 - **Pregnancy outcomes in women with chronic endometritis and recurrent pregnancy loss.** *Fertility and sterility*
McQueen, D. B., Peretto, C. O., Hazard, F. K., Lathi, R. B.
2015; 104 (4): 927-931
 - **Congenital peribronchial myofibroblastic tumor: case report of an asymptomatic infant with a rapidly enlarging pulmonary mass and review of the literature.** *Annals of clinical and laboratory science*

- Brock, K. E., Wall, J., Esquivel, M., Newman, B., Marina, N., Albanese, C., Hazard, F. K.
2015; 45 (1): 83-89
- **Genomic analysis of fibrolamellar hepatocellular carcinoma.** *Human molecular genetics*
Xu, L., Hazard, F. K., Zmoos, A., Jahchan, N., Chaib, H., Garfin, P. M., Rangaswami, A., Snyder, M. P., Sage, J.
2015; 24 (1): 50-63
 - **Features of Gastric and Colonic Mucosa in Congenital Enteropathies A Study in Histology and Immunohistochemistry** *AMERICAN JOURNAL OF SURGICAL PATHOLOGY*
Treetipsatit, J., Hazard, F. K.
2014; 38 (12): 1697-1706
 - **Features of gastric and colonic mucosa in congenital enteropathies: a study in histology and immunohistochemistry.** *The American journal of surgical pathology*
Treetipsatit, J., Hazard, F. K.
2014; 38 (12): 1697-706
 - **Evaluation of intestinal biopsies for pediatric enteropathy: a proposed immunohistochemical panel approach.** *American journal of surgical pathology*
Martin, B. A., Kerner, J. A., Hazard, F. K., Longacre, T. A.
2014; 38 (10): 1387-1395
 - **Successful Treatment with Temozolomide Combined with Chemoradiotherapy and Surgery of a Metastatic Undifferentiated Soft Tissue Sarcoma with Relapse in the Central Nervous System of a Young Adult** *JOURNAL OF ADOLESCENT AND YOUNG ADULT ONCOLOGY*
Hsu, C. H., Daldrup-Link, H. E., Yeom, K. W., Donaldson, S. S., Million, L., Hazard, F. K., Rangaswami, A.
2014; 3 (2): 100-103
 - **CONGENITAL PERIBRONCHIAL MYOFIBROBLASTIC TUMOR: CASE REPORT OF AN ASYMPTOMATIC INFANT WITH A RAPIDLY ENLARGING PULMONARY MASS**
Brock, K., Hazard, F., Newman, B., Marina, N.
WILEY-BLACKWELL.2014: S16
 - **Development of novel tumor-targeted theranostic nanoparticles activated by membrane-type matrix metalloproteinases for combined cancer magnetic resonance imaging and therapy.** *Small*
Ansari, C., Tikhomirov, G. A., Hong, S. H., Falconer, R. A., Loadman, P. M., Gill, J. H., Castaneda, R., Hazard, F. K., Tong, L., Lenkov, O. D., Felsher, D. W., Rao, J., Daldrup-Link, et al
2014; 10 (3): 566-?
 - **Cancer therapy: development of novel tumor-targeted theranostic nanoparticles activated by membrane-type matrix metalloproteinases for combined cancer magnetic resonance imaging and therapy (small 3/2014).** *Small*
Ansari, C., Tikhomirov, G. A., Hong, S. H., Falconer, R. A., Loadman, P. M., Gill, J. H., Castaneda, R., Hazard, F. K., Tong, L., Lenkov, O. D., Felsher, D. W., Rao, J., Daldrup-Link, et al
2014; 10 (3): 417-?
 - **Comparison of Latino and Non-Latino Patients With Ewing Sarcoma** *PEDIATRIC BLOOD & CANCER*
Sharib, J., Horvai, A., Hazard, F. K., Daldrup-Link, H., Goldsby, R., Marina, N., DuBois, S. G.
2014; 61 (2): 233-237
 - **Adequacy of lymph node examination in colorectal surgery: contribution of the hospital versus the surgeon.** *Medical care*
Rhoads, K. F., Ackerson, L. K., Ngo, J. V., Gray-Hazard, F. K., Subramanian, S. V., Dudley, R. A.
2013; 51 (12): 1055-1062
 - **Liver Pathology in Infantile Mitochondrial DNA Depletion Syndrome** *PEDIATRIC AND DEVELOPMENTAL PATHOLOGY*
Hazard, F. K., Ficicioglu, C. H., Ganesh, J., Ruchelli, E. D.
2013; 16 (6): 415-424
 - **Ovarian Surface Epithelial Neoplasms in the Pediatric Population Incidence, Histologic Subtype, and Natural History** *AMERICAN JOURNAL OF SURGICAL PATHOLOGY*
Hazard, F. K., Longacre, T. A.
2013; 37 (4): 548-553
 - **A Case of Genitourinary Crohn's Disease** *UROLOGY*

- Weinberg, A. E., Hazard, F. K., Hsieh, M. H.
2012; 80 (5): 1132-1134
- **Predictors of acute chemotherapy-associated toxicity in patients with Ewing sarcoma** *PEDIATRIC BLOOD & CANCER*
Sharib, J. M., Cyrus, J., Horvai, A., Hazard, F. K., Neuhaus, J., Matthay, K. K., Goldsby, R., Marina, N., DuBois, S. G.
2012; 59 (4): 611-616
 - **Congenital Pancreatoblastoma: Report of an Atypical Case and Review of the Literature** *JOURNAL OF PEDIATRIC HEMATOLOGY ONCOLOGY*
Chisholm, K. M., Hsu, C. H., Kim, M. J., Rangaswami, A., Hazard, F. K.
2012; 34 (4): 310-315
 - **Gorham's disease: diagnostic utility of an autopsy for a rare bone disease.** *Journal of pediatric health care*
Wells, K., Gray Hazard, F. K.
2011; 25 (6): 391-398
 - **PREDICTORS OF ACUTE CHEMOTHERAPY-ASSOCIATED TOXICITY IN PATIENTS WITH EWING SARCOMA**
Sharib, J., Cyrus, J., Horvai, A., Hazard, F., Matthay, K. K., Goldsby, R., Marina, N., DuBois, S. G.
WILEY PERIODICALS, INC.2011: 781
 - **First Trimester Miscarriage Evaluation** *SEMINARS IN REPRODUCTIVE MEDICINE*
Lathi, R. B., Hazard, F. K., Heerema-McKenney, A., Taylor, J., Chueh, J. T.
2011; 29 (6): 463-469
 - **Tissue microarrays from bone marrow aspirates for high-throughput assessment of immunohistologic markers in pediatric acute leukemia** *PEDIATRIC AND DEVELOPMENTAL PATHOLOGY*
Hazard, F. K., Zhao, S., Schiffman, J. D., Lacayo, N. J., Dahl, G. V., Natkunam, Y.
2008; 11 (4): 283-290