MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

LABORATORIES

2024

Molecular Services

New molecular division director, **Annette S. Kim, M.D., Ph.D.** and her team.

mlabs.umich.edu
800.862.7284

Michigan Medicine Laboratories (MLabs) is a CLIA-certified/CAP accredited laboratory offering state of the art molecular testing services that support diagnosis, prognosis and therapeutic guidance for your patients.

Our highly experienced faculty, ABMGG board-certified geneticist, medical technologist and bioinformaticians are dedicated to delivering the highest quality laboratory results to meet the needs of today's patients in a cost effective and personalized manner.

142k
SQUARE FOOT BRAND NEW STATE OF THE ART FACILITY

50+
YEARS OF EXPERIENCE

30+
MOLECULAR, PEDIATRIC & GENETIC COUNSELORS AND CONSULTANTS

M | DGG

The combined molecular (both oncology and germline) and cytogenetic laboratories of Michigan Medicine Laboratories was rebranded as the Division of Diagnostic Genetics and Genomics (DGG) in 2023 under new division director, Annette S. Kim, M.D., Ph.D., Henry Clay Bryant Professor of Pathology. This rebranding is to celebrate a new stage in the history of genetic and genomic medicine with new state-of-the-art technologies and assays under development.

MOLECULAR ONCOLOGY & GENETICS

CONSULTANTS

Eman Abdulfatah
M.D.

Elizabeth Ames
M.D., Ph.D. Board Certified Geneticist

Bryan Betz
Ph.D.

Scott Bresler
M.D., Ph.D.

Noah Brown
M.D.

May Chan
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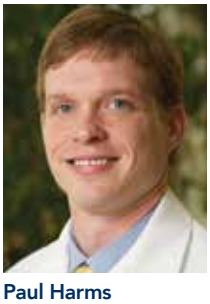
Arul M. Chinnaiyan
M.D., Ph.D.

Kyle Conway
M.D., J.D.

Thomas Giordano
M.D., Ph.D.



Paul Harms
M.D., Ph.D.

Nora Joseph
M.D.

Catherine Keegan
M.D., Ph.D. Board Certified Geneticist

Annette Kim
M.D. Ph.D. Director for Molecular and Genomic Pathology

David Manthei
M.D., Ph.D.

Aiko Otsubo
Ph.D.

Lina Shao
Ph.D. Board Certified Geneticist

Thomas E. Wilson
M.D., Ph.D.

Chan Yang
M.D., Ph.D. Board Certified Geneticist

SERVICES

MOLECULAR ONCOLOGY

Performing over 20,000 assays annually with an average turn-around-time of 5 days, our Molecular Oncology Laboratory specializes in offering cutting-edge molecular tests to aid in cancer diagnosis, selection of therapy, determination of prognosis, and monitoring of residual disease. An expanding menu of tests are offered in disease-specific service lines including a comprehensive array of both single gene assays and next-generation sequencing (NGS) panel.

3%
QNS RATE

68
MOLECULAR ONCOLOGY TESTS

SOLID TUMOR MOLECULAR ONCOLOGY

Both single gene assays and robust next generation sequencing panels to provide excellent sensitivity and broad coverage while also preserving the ability to test small biopsies and challenging specimens with low neoplastic cell content.

HEMATOLYMPHOID MOLECULAR ONCOLOGY

Single gene assays as well as a comprehensive Myeloid NGS Panel to detect clinically-relevant somatic mutations as well as gene fusions/rearrangements that can be cryptic by conventional cytogenetic methods and germline mutations associated with a predisposition to a myeloid neoplasm that might not be otherwise suspected (e.g. DDX41, ANKRD26, GATA2, ETV6, etc.). Myeloid NGS is also validated on a variety of specimen types including formalin-fixed, paraffin-embedded (FFPE) tissue.

MOLECULAR GENETICS

Molecular Genetics Laboratory offers comprehensive clinical testing for germline genetic diseases and is committed to assisting clinicians in identifying genetic aberrations to facilitate clinical diagnosis, management, and genetic counseling. Molecular Genetics Laboratory offers a variety of germline NGS (sequencing and del/dup) tests for single-gene and cancer panels including: Breast and Ovarian, Colorectal, Pancreatic, Endometrial/Uterine, Stomach, and Prostate. In addition, the laboratory offers SNP Chromosomal Microarray; screening and diagnostic testing for cystic fibrosis and spinal muscular atrophy; methylation analysis for Prader-Willi/Angelman syndrome, Beckwith-Wiedemann & Russel-Silver syndrome, and other imprinting disorders; and Fragile X tests.

8
PANELS

80+
GENETIC TESTS

SELECT TEST MENU

Molecular Oncology

MYELOID NEOPLASMS (AML, MDS, MPN)

Myeloid NGS Panel*

NPM1 Mutation (PCR)
FLT3 Mutation (PCR)
CEBPA Mutation (Sanger)
IDH1 and IDH2 Mutation (Sanger)
KIT D816V Mutation (PCR)
KIT Mutation for AML - Exons 8, 17 (Sanger)
PML/RARA t(15;17) Translocation Quantitative (PCR)
JAK2 V617F Mutation (PCR)
JAK2 Exon 12 Mutation (PCR)
CALR Mutation (PCR)
MPL Mutation (PCR)
BCR/ABL1 Analysis, Quantitative (PCR)
BCR/ABL1 Kinase Domain Mutation (Sanger)

BREAST CANCER

HER2 (FISH)
PIK3CA Mutation (NGS)
PD-LI (IHC)

LYMPHOPROLIFERATIVE DISORDERS

B Cell Clonality (PCR) (IGK & IGH Gene Rearrangement)
B Cell Clonality (PCR) (IGK Gene Rearrangement)
B Cell Clonality (PCR) (IGH Gene Rearrangement)
T Cell Clonality (PCR) (TRG & TRB Gene Rearrangement)
T Cell Clonality (PCR) (TRG Gene Rearrangement)
T Cell Clonality (PCR) (TRB Gene Rearrangement)
IGH/BCL2 t(14;18) Translocation (PCR)
IGH/BCL2 t(14;18) Translocation (FISH)
BCL6 (3q27) Rearrangement (FISH)
MYC (8q24) Rearrangement (FISH)
MALT1 (18q21) Rearrangement (FISH)
MYD88 (L265P) Mutation (PCR)
BRAF V600E/V600K Mutations (PCR)

COLORECTAL AND ENDOMETRIAL CANCER

Colorectal Cancer NGS Panel*

MLH1 Promoter Methylation (PCR)
KRAS Mutation (NGS)
NRAS Mutation (NGS)
BRAF V600E/V600K Mutations (PCR)
Microsatellite Instability Analysis (PCR)
UGT1A1 Promoter Genotyping (PCR)
POLE Mutation (Sanger)

GASTROINTESTINAL STROMAL TUMOR

KIT Mutation - Exons 9,11,13,17 (Sanger)
PDGFRA Mutation for GIST (Sanger)

GENITOURINARY TUMOR

FGFR Mutation/Translocation (NGS)
BRAF (7q34) Rearrangement (FISH)
ERG Rearrangement (FISH)
TFE3 (Xp11,2) Rearrangement (FISH) for Renal Cell CA & Other Tumors
TFEB (6p21) Rearrangement (FISH) for Renal Cell Carcinoma
UroVysion™ (FISH) (Bladder Cancer)
TERT Promoter Mutation (PCR)

NEURO-ONCOLOGY

Solid Tumor NGS Panel*

BRAF (7q34) Rearrangement (FISH)
IDH1 and IDH2 Mutations for Glioma (NGS)
1p/19q Deletion (FISH)
BRAF V600E/V600K Mutations (PCR)
MGMT Promoter Methylation (PCR)
TERT Promoter Mutation (PCR)
Neuropathology Methylation Array
Cancer Cytogenomics Array

LUNG CANCER

Lung Cancer NGS Panel*

EGFR Mutation (NGS)
BRAF V600E/V600K Mutations (PCR)
KRAS Mutation (NGS)
ALK Rearrangement for NSCLC (FISH)
ROS1(6q22) Rearrangement (FISH)
RET (10q11) Rearrangement (FISH)
PD-L1 (IHC)
MET Amplification (FISH)

MELANOMA

Melanoma NGS Panel*

BRAF (7q34) Rearrangement (FISH)
BRAF V600E/V600K Mutations (PCR)
KIT Mutation for Melanoma - Exons 11,13,17 (Sanger)
NRAS Mutation (NGS)
Chromosomal (Microarray) for Melanoma
Multiprobe (FISH) for Melanoma
TERT Promoter Mutation (PCR)
Cancer Cytogenomics Array

PROSTATE CANCER

Prostate Cancer Antigen 3 (PCA3)

BONE AND SOFT TISSUE

SYT/SSX Translocation (PCR)
PAX/FOXO1 Translocation (PCR)
EWSR1/WT1 Translocation (PCR)
EWSR1/ATF1 Translocation (PCR)
EWSR1/FLI1 & EWSR1/ERG Translocation (PCR)
EWSR1 (22q12) Rearrangement (FISH)
MDM2 Amplification (FISH)
CIC (19q13) Rearrangement (FISH)
DDIT3 (12q13) Rearrangement (FISH)
PDGFB (22q13) Rearrangement (FISH)
USP6 (17p13) Rearrangement (FISH)

THYROID CANCER

BRAF V600 E/V600K Mutations (PCR)
BRAF (7q34) Rearrangement (FISH)
TERT Promoter Mutation (PCR)

MISCELLANEOUS

Solid Tumor NGS Panel*

Biliary Tract Malignancy (FISH)
Bone Marrow Transplant Engraftment Analysis (PCR)
HER2 (FISH)
UGT1A1 Promoter Genotyping (PCR)
Mesothelioma (FISH)
PD-LI (IHC)

*NGS Panels include: mutations (35 genes), amplification (19 genes) and gene fusion (21 genes)

TEST LISTING CONTINUED ON BACK

SELECT TEST MENU CONTINUED

Genetics (Germline)

AUTISM SPECTRUM DISORDERS/ INTELLECTUAL DISABILITY

Chromosomal Microarray Analysis
Fragile X Syndrome Mutation
Prader-Willi /Angelman Syndrome
CDKL5 Gene Sequencing
GDI1 Gene Sequencing
MBD5 Gene Sequencing
MEF2C Gene Sequencing
NLGN3 Gene Sequencing
NLGN4X Gene Sequencing
SHANK2 Gene Sequencing
SHANK3 Gene Sequencing
SLC9A6 Gene Sequencing
TCF4 Gene Sequencing
UBE3A Gene Sequencing

MECP2 (RETT SYNDROME)

MECP2 Gene Sequencing
MECP2 Deletion/Duplication
MECP2 Targeted Sequencing Familial

PTEN HARMARTOMA TUMOR SYNDROME

PTEN Gene Sequencing
PTEN Deletion/Duplication
PTEN Targeted Sequencing Familial

BREAST AND OVARIAN CANCER

BRCA1 and BRCA2 Gene Sequencing
BRCA1 and BRCA2 Targeted Sequencing, Familial
BRCA1 and BRCA2 Deletion/Duplication
BRCA Ashkenazi Jewish Founder Mutations
BRCA Mutation Panel
Hereditary Breast and Ovarian Cancer (HBOC) Comprehensive Germline NGS Panel
Hereditary Breast and Ovarian Cancer (HBOC) High-Moderate Risk Germline NGS Panel
PTEN Gene Sequencing
PTEN Deletion/Duplication
TP53 Gene Sequencing
TP53 Deletion/Duplication

COLORECTAL CANCER

Colorectal Cancer Germline NGS Panel
MSH2 Gene Sequencing
MLH1 Promoter Methylation (PCR)

CYSTIC FIBROSIS

Cystic Fibrosis Carrier Screening
Cystic Fibrosis Full Gene Sequencing
Cystic Fibrosis Deletion/Duplication
Cystic Fibrosis Diagnostic Mutation Detection
Cystic Fibrosis Targeted Sequencing Familial

HEARING LOSS

GJB2 (Connexin 26) Mutation Analysis
GJB2 (Connexin 26) Targeted Sequencing Familial
GJB6 (Connexin 30) Deletion Analysis
WFS1 (Wolfram Syndrome) Gene Sequencing

NOONAN SYNDROME

PTPN11 Gene Sequencing
KRAS Gene Sequencing
RAF1 Gene Sequencing
SOS1 Gene Sequencing

FRAGILE X SYNDROME

Fragile X Syndrome Mutation Detection

LI-FRAUMENI SYNDROME

TP53 Gene Sequencing
TP53 Deletion/Duplication

NEUROFIBROMATOSIS

NF1 Gene Sequencing

SPINAL MUSCULAR ATROPHY

SNM1 and SNM2 Deletion/Duplication

MISCELLANEOUS

Apolipoprotein E Genotyping
Factor V Leiden Mutation
Hereditary Hemochromatosis Mutation
Prothrombin 20210 Mutation

CANCER GERMLINE NGS PANELS

Colorectal Cancer Germline NGS Panel
19 Genes: MLH1, MSH2, MSH6, MUTYH, PMS2, EPCAM, APC, TP53, PTEN, STK11, SMAD4, BMPR1A, CDH1, CHEK2, GREM1, POLD1, POLE, ATM, AXIN2

Endometrial/Uterine Cancer Germline NGS Panel
13 Genes: BRCA1, BRAC2, CHEK2, EPCAM, MLH1, MSH2, MSH6, MUTYH, PMS2, PTEN, TP53, STK11, POLD1

Hereditary Breast and Ovarian Cancer Comprehensive Germline NGS Panel
21 Genes: ATM, BARD1, BRAC1, BRAC2, BRIP1, CDH1, STK11, CHEK2, EPCAM, MLH1, MSH2, MSH6, NBN, PALB2, PMS2, PTEN, RAD51C, RAD51D, TP53, FANCC, XRCC2

Hereditary Breast and Ovarian Cancer High-Moderate Risk Germline NGS Panel
9 Genes: ATM, BRAC1, BRAC2, BRIP1, CDH1, CHEK2, PALB2, PTEN, TP53

Pancreatic Cancer Germline NGS Panel
18 Genes: APC, ATM, BRCA1, BRCA2, CDKN2A, EPCAM, MLH1, MSH2, MSH6, PALB2, PMS2, STK11, TP53, CDK4, BMPR1A, SMAD4, VHL, XRCC2

Prostate Cancer Germline NGS Panel
6 Genes: BRCA1, BRCA2, CHEK2, HOXB13, NBN, TP53

Stomach Cancer Germline NGS Panel
11 Genes: MLH1, MSH2, MSH6, EPCAM, PMS2, APC, TP53, STK11, CDH1, BMPR1A, SMAD4