University of Iowa Carver College of Medicine
University of Iowa Health Care

Molecular Otolaryngology & Renal Research Laboratories
For test inquiries please call: 319-335-6623 • For billing inquiries call: 319-335-6653
Fax: 319-353-5869 or 319-335-9890
Email: morl@uiowa.edu • https://morl.lab.uiowa.edu
CLIA: 16D0966193

MORL - Kidney Testing Requisition Form

Effective as of 1/1/2023

REFERRING LABORATORY USE ONLY: *please complete below section*

Requisition Date: Completed by: Accn#:

FOR MORL USE ONLY:
MORL Case #:

Collection: Blood Date:_____ #Tubes:_____ Serum Date: _____ #Tubes: _____ Plasma Date: _____ #Tubes: _____

Part A) Patient Information or ID Sticker *(Required)*

Name: _____
Last First

DOB: _____ /_____ /_____
month day year

Sex: ☐Male ☐Female

MRN:_____

Part A$_1$) Patient Demographic Information *(Required)*

Ethnicity: ☐ Hispanic ☐ Not Hispanic

Race: ☐ Caucasian ☐ Black or African American
☐ Asian ☐ American Indian/Alaska Native
☐ Native Hawaiian or Other Pacific Islander
☐ More Than One Race _____

Part B) Reporting Information *(Required)*

Health Care Provider:

E-mail Address:

Institution:

Street Address:

City: State: Zip:

Phone: ( ) FAX: ( )

Part C) Payment Information (*Required*)

Institutional billing or payment by Visa or MasterCard is accepted.

*****The MORL will NOT submit to insurance.**

Billing Contact:

Institution:

Street Address:

City: State: Zip:

Phone: ( ) FAX: ( )

If you or your patient would like to pay by credit card please contact Jori Hendon at 319-335-6653

Part D) Pertinent Clinical Information (*Required*) – Complete the section below

Diagnosis: ☐ aHUS: Trigger? ☐ **No** ☐ **Yes** *(if **yes**, describe trigger, eg. BMT, pregnancy, pneumococcal)*:_____
☐ DDD ☐ C3GN ☐ PIGN ☐ TTP ☐ STEC-HUS ☐ Other (complete): _____

Family history of renal disease? ☐ **No** ☐ **Yes** *(if **yes**, please provide details in comment & attach a pedigree if available)*

Disease History **Date of onset of symptoms:** _____

C3 Level: _____ nl range: _____ Date: _____
C4 Level: _____ nl range: _____ Date: _____
Renal biopsy: ☐ **Yes** ☐ **No** Date: _____
Hematuria: ☐ **Yes** ☐ **No**
Diarrhea: ☐ **Yes** ☐ **No**
Schistocytes: ☐ **Yes** ☐ **No**

Current Lab Values

	Value	Normal Range	Test Date
Hg/Hct:			
Haptoglobin:			
Platelets:			
sCr/BUN:			
LDH:			
uProt/uCr:			
Urine Blood:			
C3 Level:			
C4 Level:			
ADAMTS13:			

Specimen Information:

Was specimen drawn pre or post:	**Procedure date:**	**Pre-Procedure**	**Post-Procedure**	**N/A**
Eculizumab:		☐	☐	☐
PLEX (*affects serologies):		☐	☐	☐
Renal Tx:		☐	☐	☐
BMT(*affects genetics):		☐	☐	☐
Liver Tx:		☐	☐	☐

Comments:

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Patient Name: _____ **DOB:** _____ **MRN:**_____

Please see page 3 for sample handling requirements - No Weekend Deliveries

Functional Testing Panels Requested

☐ **C3 Glomerulopathy Complement Panel (C3G-CP)**
(serologies for complement-mediated renal diseases)
(CH50, APFA, C3b Deposition Assay, Fluid Phase Activity (IFE), FHAA, FBAA, Nephritic Factors (C3Nef (C3CSA), C5Nef (C3CSAP) C4Nef), C3, C3c, C4, FD, FB, Ba, Bb, C5, Properdin, Soluble C5b-9, FI and FH levels)
- 2 mL frozen serum
- 2 mL frozen EDTA plasma

☐ **aHUS (complement-mediated TMA) Panel (aHUS-FP)**
(CH50, APFA, C3b Deposition Assay, FHAA, FBAA, Fluid Phase Activity (IFE), C3, C3c, C4, FD, FB, Ba, Bb, C5, Properdin, Soluble C5b-9, FI and FH levels)
- 2 mL frozen serum
- 2 mL frozen EDTA plasma

☐ **Autoantibody Panel**
(FHAA, FBAA, Fluid Phase Activity (IFE), Nephritic Factors (C3Nef (C3CSA), C5Nef (C3CSAP), C4Nef)
- 2 mL frozen serum

☐ **Complement Biomarker Panel (CBP)**
(C3, C3c, C4, FD, FB, Ba, Bb, C5, Properdin levels, Soluble C5b-9, FH and FI levels)
- 2 mL frozen serum
- 2 mL frozen EDTA plasma

☐ **Complement Pathway Activity Panel (CPAP)**
(CH50, APFA, C3b Deposition Assay)
- 2 mL frozen serum

Genetic Testing Requested

☐ **Genetic Renal Panel** (DNA test for TTP, aHUS, HUS, DDD, C3G and other complement diseases)
(CFH, CFI, MCP, CFB, CFHR5, C3, THBD, ADAMTS13, PLG, DGKE, G6PD, MMACHC, WT1 and MLPA*)*
- 8-10 cc EDTA whole blood (room temp or refrigerated)
OR
- 10 µg DNA, minimum concentration 50 ng/µl

☐ **MLPA Testing ONLY** (screening for copy number variations in the *CFH-CFHR5* genomic region)
- 8-10 cc EDTA whole blood (room temp or refrigerated)
OR
- 10 µg DNA, minimum concentration 50 ng/µl

☐ **Familial Testing** (site specific analysis to screen for variants previously identified in a family member)

Familial Testing Details:

Gene/s: _____

MORL ID# or Variant/s: _____

Relationship to previously tested person: _____

If you are interested in ordering Custom Testing please contact Amy Weaver at 319-335-6623 or amy-weaver@uiowa.edu

a La Carte Testing Requested

Autoantibody Tests – 2 mL Frozen Serum

☐ **FH autoantibody (FHAA)** ☐ **FB autoantibody (FBAA)**
☐ **Fluid Phase Activity (IFE)** ☐ **C3Nef (C3CSA)**
☐ **C5Nef (C3CSAP)** ☐ **C4Nef**

Biomarker Tests – 1 mL Frozen EDTA Plasma

☐ **C3 Level** *(1 mL frozen serum)* ☐ **C3c Level**
☐ **C4 Level** *(1 mL frozen serum)* ☐ **FD Level**
☐ **FB Level** ☐ **BA Level** ☐ **Bb Level**
☐ **Properdin Level** ☐ **C5 Level** ☐ **Soluble C5b-9**
☐ **FI Level** ☐ **FH Level**

Complement Pathway Function Tests – 1 mL Frozen Serum

☐ **CH50** ☐ **C3b Deposition Assay**
☐ **APFA (Alternative Pathway Functional Assay)**

ADAMTS-13 Tests – 1 mL Frozen Citrate Plasma

☐ **ADAMTS-13 Activity**
☐ **ADAMTS-13 Activity with reflex to Inhibitor** (when activity <25%)

Important Information for ALL Requests

All serum and plasma samples MUST be processed and frozen down to -80° C immediately after collection (please see instructions on page 3). Sample type must be clearly labeled (either serum or plasma) and shipped out overnight on at least 5 lb dry ice (Monday – Thursday).
If samples arrive thawed they will be REJECTED.
No Weekend Deliveries

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Ship to:
Dr. Richard Smith
Molecular Otolaryngology & Renal Research Laboratories
The University of Iowa
285 Newton Rd., 5270 CBRB
Iowa City, IA 52242-1078

Monday — Friday ONLY – No Weekend Deliveries

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Molecular Otolaryngology & Renal Research Laboratories Sample Requirements

*Questions? Contact Amy Weaver at 319-335-6623 or **amy-weaver@uiowa.edu***

Genetic Renal Panel/MLPA/DNA Testing Sample Requirements:

- 8-10 cc. EDTA whole blood (minimum amount of 3-4 cc. is accepted for children under age 4)
- **OR** 10 µg DNA, minimum concentration 50ng/µl (A260/A280 1.8-2) resuspended in 0.1mM EDTA (10mM Tris HCl, 0.1mM EDTA, pH 8, Teknova Cat# T0220)
  Note: MORL is not responsible for broken tubes.
- ***Please note: blood samples drawn from a bone marrow transplant patient will result in genetic results for the donor rather than the patient.**
- Overnight delivery, Room temperature or refrigerated **(DO NOT FREEZE WHOLE BLOOD)**
- Samples are accepted Monday-Friday.
- Samples may be refrigerated if delivery is delayed (stability – 1 week)

Serum (FB & FH autoantibody, C3b Deposition, APFA, CH50, Fluid Phase Activity (IFE), C3Nef (C3CSA), C5Nef (C3CSAP), C4Nef, C3 and C4 Levels) Collection Protocol (minimum volume 2ml) *PLEX treatments will affect serum tests, please wait ~14 days after PLEX to draw samples:

1. Follow standard phlebotomy techniques to collect at least **6 cc** of whole blood drawn in a **red-top** vacutainer tube.
   Note: Serum separators with "clot activators" should not be used for the serum samples.
2. Allow the blood in the **red-top** tube to clot at room temperature for 30 minutes.
3. Centrifuge the clotted blood at room temperature (1000 x g for 10 minutes).
4. **Label "Serum" or "Red-top"** on clean screw top-tube (s).
5. Pipette **cell-free supernatant** (at least 2 mL) to each labeled tube (s).
6. **Place the tube immediately at -80°C (or on dry ice). Sample must remain deep frozen.**
   Note: Do not transfer cells with serum. If necessary centrifuge a second time.

Plasma (Soluble C5b-9, C3c, Ba, Bb, Properdin, C5, FD, FB, FH, FI levels) Collection Protocol (minimum volume: 2ml)
***PLEX treatments will affect plasma tests, please wait ~14 days after PLEX to draw samples:**

1. Follow standard phlebotomy techniques to collect at least **6 cc** of whole blood drawn in a **lavender-top** (EDTA) vacutainer tube.
2. Centrifuge at room temperature immediate after blood draw (1000 x g for 10 minutes).
3. **Label "Plasma" or "Lavender-top"** on clean screw top-tube(s).
4. Pipette **cell-free supernatant** (at least 2 mL) to each labeled tube (s).
5. **Place the tube immediately at -80°C (or on dry ice). Sample must remain deep frozen.**
   Note: Do not transfer cells with plasma. If necessary centrifuge a second time.

Plasma (ADAMTS-13 Activity/Inhibitor) Collection Protocol (minimum volume: 0.5ml):

1. **Follow standard phlebotomy procedure to collect blood in buffered sodium citrate (light blue-top, 3.2%) plastic tubes (available in 4.5 mL, 2.7 mL or 1.8 mL full draw tubes).**
2. **After collection, invert the tube gently 5 to 6 times.**
3. **Label "Citrate Plasma" or "Blue-top" on clean cryovial screw-top tubes.**
4. **Store the blue-top tube upright at room temperature until centrifugation. Samples should be centrifuged between 15 to 60 minutes after blood collection for best results.**
5. **Re-mix the blood sample immediately prior to centrifugation by gently inverting the tube 5 to 6 times.**
6. **Centrifuge blood sample at room temperature in a horizontal rotor (swinging bucket rotor) for 15-20 minutes at 1500 to 1800 x g with the *brake off*.**
7. Following centrifugation, transfer the top two-thirds of the plasma layer into a new plastic tube.
8. Re-centrifuge the collected plasma at 1500 to 1800 x g with the *brake off* for an additional 15-20 minutes to remove any red cells or platelets.
9. Transfer the top two-thirds of the plasma into the previously labeled cryovials, taking care not to disturb any cells at the bottom of the tube.
10. **Place the tube immediately at -80°C (or on dry ice). Sample must remain deep frozen.**

    Note: if the sample arrives at room temperature a new sample will be required.

Serum & Plasma Shipping Requirements:

- **Serum and plasma must be frozen and shipped OVERNIGHT with a minimum of 3 kg (or 6 lbs) of dry ice.**
- **Cryovials should be put in zip lock bags and completely covered in dry ice to keep the sample frozen until it arrives in the lab.**
- **Delivery: Monday-Friday. NO WEEKEND DELIVERIES**
- **Thawed OR unlabeled samples will be REJECTED for testing.**

Ship all samples to:

Dr. Richard Smith
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The University of Iowa
285 Newton Rd., 5270 CBRB
Iowa City, IA 52242-1078
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Complement Panel tests offered by the MORL:	Test Code:
C3 Glomerulopathy Complement Panel (serologies for DDD, C3GN), Serum and Plasma - CH50, APFA, C3b Deposition Assay, Fluid Phase Activity Assay (IFE), FHAA, FBAA, Nephritic Factors (C3Nef (C3CSA), C5Nef (C3CSAP), C4Nef), C3, C3c, C4, FD, FB, Bb, Ba, C5, Properdin, Soluble C5b-9 (sC5b-9), FI and FH levels	C3G-CP
aHUS (complement-mediated TMA) Panel (serologies for TTP, aHUS, HUS), Serum and Plasma - CH50, APFA, C3b Deposition Assay, FHAA, FBAA, Fluid Phase Activity Assay (IFE), C3, C3c C4, FD, FB, Ba, Bb, C5, Properdin, Soluble C5b-9 (sC5b-9), FI and FH levels	aHUS-FP
Autoantibody Panel, Serum - Fluid Phase Activity Assay (IFE), FHAA, FBAA, Nephritic Factors (C3Nef (C3CSA), C5Nef (C3CSA)P, C4Nef)	AAP
Complement Biomarker Panel, Serum and Plasma - C3, C3c, C4, FB, Ba, Bb, C5, FD, Properdin levels, Soluble C5b-9 (sC5b-9), FI and FH levels	CBP
Complement Pathway Activity Panel, Serum - CH50, APFA, C3b Deposition Assay	CPAP

Autoantibodies to Complement Components	Test Code:
Fluid Phase Activity Assay, Serum (IFE)	07FPA
FH Autoantibody, Serum (ELISA)	07FHAA
FB autoantibody, Serum (ELISA)	07FBAA
C3Nef (C3CSA), Serum (Hemolytic)	06C3NEF
C5Nef (C3CSAP), Serum (Hemolytic)	06C5NEF
C4Nef, Serum (Hemolytic)	06C4NEF

Functional Assays of Complement Activity - Pathways	Test Code:
CH50, Serum (Liposome-based method)	07CH50
Alternative Pathway Functional Assay (APFA), Serum (ELISA)	06APFA
C3b Deposition Assay (Hemolytic)	01C3BDA

Complement Protein Biomarkers (including split products)	Test Code:
C3 Level, Serum (Turbidimetry)	07C3L
C3c Level, Plasma (ELISA)	06C3CL
C4 Level, Serum (Turbidimetry)	07C4L
FD Level, Plasma (ELISA)	01FDL
FB Level, Plasma (ELISA)	07FBL
Ba Level, Plasma (ELISA)	06BAL
Bb Level, Plasma (ELISA)	06BBL
C5 Level, Plasma (ELISA)	06C5L
Properdin Level, Plasma ELISA)	06PL
Soluble C5b-9, Plasma (ELISA)	06SMAC
FI Level, Plasma (ELISA)	07FIL
FH Level, Plasma (ELISA)	06FHL

ADAMTS-13	Test Code:
ADAMTS-13 Activity (a la carte only), Citrate Plasma (FRET)	01ATS13
ADAMTS-13 Activity with reflex to Inhibitor Assay (if activity is <25%), Citrate Plasma (FRET)	01ATS13RFX

Genetic Tests Offered by the MORL:	Test Code:
Genetic Renal Panel: NGS + MLPA (CNVs) for Complement-Mediated Kidney Disease	GRP08
MLPA (CFH-CFHR5): Multiplex Ligation Dependent Probe Amplification	MLPA02

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ALL requested information must be provided or testing will not be performed

We request extensive patient demographic and clinical information. This information is required as it is very valuable in the interpretation of your patient's results.

Patient information:	• Patient date of birth and gender • Patient ethnicity and race • Patient's clinical information and family history of kidney disease
Specimen information:	• Patient identifiers (**full name, date of birth, sex and medical record number**) • Date of collection • **Sample type – frozen samples must be CLEARLY LABELED as either serum or plasma and type (i.e. EDTA or Citrate)** • Ordering physician
Billing information:	• We are not able to bill insurance, Medicare or patient directly. • Institutional billing accepted. Visa and Mastercard accepted. • Personal checks NOT accepted • Please include contact information including phone and fax number for billing questions.
Reporting Information:	Because of confidentiality issues, reports will only be released to the individual indicated on the page 1 of the testing requisition form.
Research Participation:	If your patient's genetic and functional testing results are inconclusive, they may qualify for research studies on complement-mediated renal diseases that are ongoing at the MORL. If you would like your patient to be considered for this opportunity, please contact Amy Weaver at **amy-weaver@uiowa.edu**.

IMPORTANT INFORMATION FOR PHYSICIAN OR GENETIC COUNSELOR:

DNA tests may detect an abnormality. Detection methods are greater than 99% accurate. Many of these tests are relatively new. The analysis and interpretation represents our best knowledge and understanding of the genetics of these diseases.

There is a small possibility that a test may not work properly or an error may occur. You may be asked for an additional sample if it is felt that confirmatory testing is needed.

An error in diagnosis may occur if incorrect information is provided with the sample.

Kidney diseases are complex disorders and penetrance of a phenotype (the degree of kidney disease, for example) may be variable. Research to determine whether a genotype-phenotype correlation exists is ongoing.

Because of the complexity of DNA testing, results should be discussed with a genetic counselor or physician.

Note: Kidney diseases are very complex disorders. This complexity means that variants in many different genes can lead to kidney disease. It is possible that no variants will be detected in the variant screens (the genes) you have requested.

DISCLAIMER:
This request to order molecular diagnostic tests from the MORL certifies to the MORL that the ordering physician has obtained informed consent from the patient as required by applicable state or federal laws for each test ordered, that the ordering physician has authorization from the patient permitting the MORL to report results for each test ordered to the ordering physician, and that the ordering physician assumes responsibility for providing the patient with all associated guidance and counseling regarding the test results.