Molecular Test for *APOL1* Genotyping

The UNC Hospitals Molecular Genetics Laboratory offers molecular testing by TaqMan genotyping to detect the *APOL1* G1 and G2 alleles associated with increased risk of kidney disease.

Biology of the Disease:

The *APOL1* gene encodes apolipoprotein L-I (apoL-I), a serum apolipoprotein bound to high-density lipoprotein (HDL) particles that acts as the trypanosome lytic factor in normal human serum. Two specific *APOL1* African population variants are associated with resistance to *Trypanosoma brucei rhodesiense* infection: *APOL1* alleles G1 (rs73885319, rs60910145) and G2 (rs71785313). These alleles are associated with increased susceptibility to kidney disease when two biallelic risk alleles are present (G1/G1, G1/G2 or G2/G2). An estimated 13% of African Americans (> 5 million) have 2 risk alleles and are at increased risk of kidney disease. In addition, transplanted kidneys from high-risk *APOL1* donors have reduced allograft survival.

Clinical Indications for Testing:
Testing may be indicated in individuals of African descent with a personal or family history of kidney disease or at increased risk of kidney disease due to underlying conditions (e.g. hypertension, lupus, HIV-infection). In addition, testing may be useful in kidney transplant donors in order to assess risk of graft failure.

Laboratory testing for *APOL1*: The preferred sample is ACD or EDTA anticoagulated blood (pale yellow top or lavender top, 1- 3ml) which may be refrigerated up to 48 hours prior to testing.

Molecular testing for the *APOL1* G1 (NM_001136540.2:c1024A>G, p.Ser342Gly; rs73885319; NM_001136540.2:c1152T>G, p.lle384Met; rs60910145) and G2 (NM_001136540.2:c.1164_1169del, p. Asn388_Tyr389del; rs71785313) risk variants is performed by TaqMan genotyping. Genomic DNA is extracted from a peripheral blood sample, and *APOL1* G1 and G2 regions are PCR amplified and detected by TaqMan allelic discrimination assays. The reference range for this test is *APOL1* G0/G0 (normal genotype).

References:

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3. Freedman BI, Pastan SO, Israni AK, et al. APOL1 Genotype and Kidney Transplantation Outcomes From Deceased African American Donors. Transplantation. 2016;100(1):194-202.
4. Mena-Gutierrez AM, Reeves-Daniel AM, Jay CL, Freedman BI: Practical considerations for APOL1 genotyping in the living kidney donor evaluation. Transplantation 104: 27–32, 2020. PMID:31449181

5. Doshi MD, Ortigosa-Goggins M, Garg AX, Li L, Poggio ED, Winkler CA, Kopp JB: APOL1 genotype and renal function of Black living donors. J Am Soc Nephrol 29: 1309–1316, 2018. PMID:29339549

Questions?

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