



Laboratory Service Manual

Lab Dept: **Anatomic Pathology**

Test Name: **ANOPHTHALMIA, MICROPHTHALMIA (SOX2)
KNOWN MUTATION**

General Information

Lab Order Codes: SOXK (Blood or Buccal Swab)

Synonyms: Developmental Eye Disorders Gene Testing

CPT Codes: 83891 x2 – Isolation or extraction of highly purified nucleic acid
83894 x4 – Separation by gel electrophoresis
83892 x1 – Molecular diagnostics; enzymatic digestion
83898 x2 – Amplification of nucleic acid
83904 x2 – Mutation identification by sequencing, single segment

Test Includes: Testing of a relative for a specific known mutation (carrier testing) where testing was previously done by GeneDx. Using genomic DNA, the exon or exons of interest are screened by bi-directional sequence analysis and/or by non-sequence methods such as heteroduplex analysis or restriction enzyme digestion. The previously tested proband DNA serves as a positive control.

Logistics



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Test Indications:

Several developmental eye disorders have a known genetic basis including microphthalmia and anophthalmia. Anophthalmia is the complete absence of the globe, or bulb, of the eye and hence the most structural eye malformation. A milder form is microphthalmia, where total axial length of the eye globe is the least two standard deviations below the mean for age. Simple microphthalmia refers to a structurally normal eye with short total axial length. In each of these conditions, the eyelids, conjunctiva and lacrimal apparatus are normal. In complex microphthalmia, additional abnormalities are present and may include anterior segment dysgenesis, cataract, persistent hyperplastic primary vitreous, chorioretinal coloboma and/or retinal dysplasia. In addition, anophthalmia and microphthalmia may be seen in association with various genetic syndromes or chromosome abnormalities. Mutations in the SOX2 and SIX6 genes leading to haploinsufficiency may be associated with hearing loss, developmental delay, esophageal atresia, genitourinary abnormalities, myopathy, and spastic diplegia. Hemizygoty for SIX6 has been seen in some cases of bilateral anophthalmia due to interstitial chromosome deletions. Homozygoty for PAX6 mutation has also been associated with anophthalmia.

Carrier testing reasons for referral:

1. Testing parents of a child with a specific dominant mutation, in order to determine if the mutation in the child is new or inherited.
2. Carrier testing in parents of a child with apparently homozygous recessive mutations, to rule out the possibility that the child has one mutated allele and one allele that is deleted or refractory to amplification.
3. Carrier testing in the parents of a child with recessive mutations, to confirm that all four parental alleles can be detected prior to prenatal diagnosis.
4. Pre-symptomatic testing in siblings of the index case.
5. Carrier testing in the extended family.

Lab Testing Sections: Anatomic Pathology - Sendouts

Referred to: GeneDx, Inc. (GDX#: 901, Specify gene/mutation)

Phone Numbers:

Minneapolis: 612-813-6280

Saint Paul: 651-220-6550

Test Availability: Daily, 24 hours (Preferred draws are Sunday - Thursday as specimens can only be received at the reference lab Monday - Friday. Specimens collected Friday or Saturday will be held for shipment on Monday.)

Turnaround Time: 2 - 4 weeks



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Special Instructions: A GeneDx signed [consent form](#) and [request form](#) must be sent with any patient or specimen to the laboratory.

SOX2 can be tested using cells obtained by swabbing the buccal mucosa (inside of cheek). Buccal swab collection kits are available from GeneDx (ph. 301-519-2100). Buccal Kit info link: http://www.genedx.com/buccal_swab_kits.php

Specimen

Specimen Type: Whole blood

Buccal cell swab (preferred specimen)

Container: Blood: Lavender top (EDTA) tube

Buccal Smear: Cytobrush Plus Cell Collector® kit

Draw Volume: 1 - 5 mL blood

2 swabs from the Cytobrush Plus Cell Collector® kit

Processed Volume: Same as Draw Volume

Collection: Routine venipuncture for blood specimens, invert gently to mix

Buccal swab kit for buccal swabs:

Buccal Cell Collection procedure:

1. Remove a swab from the Buccal swab kit touching only the “stick” end.
2. **Do Not** rinse mouth before starting. Have the individual open his/her mouth. Twirl the swab on the inner cheek for 30 seconds. **Do Not** scrape so hard that the cheek bleeds.
3. Place the swab end in the labeled tube. Cut the “stick” with scissors at the level of the top of the tube. Replace cap and close completely.
4. Repeat the process with another swab on the opposite cheek.
5. Send the kit to the lab for processing and mailing.



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Special Processing: Lab Staff: Send whole blood in original collection container labeled with patient name, date of birth and medical record number, including signed consent form and requisition, with a cool pack, via overnight or second-day courier so that the sample will arrive at GeneDx, Inc. on a weekday (Monday through Friday). Samples drawn on Friday or Saturday should be held at refrigerated temperatures for shipment on Sunday. **Do not** freeze. **Note:** Specimens may be stored at refrigerated temperatures for up to 3 days prior to shipping.

Mail the Cytobrush Plus Cell Collector® kit, including signed consent form and requisition, by regular mail to GeneDx in the included envelope.

Patient Preparation: For buccal cell collection, **Do Not** have the patient rinse his/her mouth.

Sample Rejection: Unrefrigerated specimens older than 48 hours, clotted or hemolyzed for blood, frozen specimens, mislabeled or unlabeled specimens

Interpretive

Reference Range: Interpretive report

Critical Values: N/A

Limitations: N/A

Methodology: Bi-directional sequence analysis or other methods as required

References: [GeneDx, Inc.](#) February 2008
(301) 519-2010 Fax (301) 519-2892