

Using Genetic Testing to Diagnose Chronic Granulomatous Disease (CGD)

Indications:

- Recurrent, severe bacterial or fungal infections, usually with catalase-positive organisms
- Chronic inflammatory granulomas, frequently manifesting as infectious dermatitis or severe abscesses in the skin and organs
- Male-limited family history of severe bacterial or fungal infections and chronic granulomas, or a family history of *CYBB*-related X-CGD

Benefits:

- Early diagnosis of CGD can allow timely initiation of treatment, improving prognosis by preventing life-threatening infections.¹
- Identifying a mutation in *CYBB* can distinguish X-linked CGD from autosomal recessive forms of the disease, with important implications for timely diagnosis and treatment of affected descendants.

Background:

- CGD occurs with an estimated incidence of between 1 in 200,000 and 1 in 250,000 births,² and is characterized by potentially life-threatening bacterial and fungal infections and chronic inflammatory granulomas.^{3,4}
- CGD has been linked to loss-of-function mutations in at least six different genes, with X-linked loss-of-function mutations in *CYBB* accounting for 70-75% of all cases. All other causes of CGD are inherited in an autosomal recessive pattern.
- Standard biochemical diagnostic tests do not always reliably predict the inheritance pattern of CGD-related mutations, since skewing of X-inactivation toward the X chromosome carrying the normal *CYBB* copy may obscure the effects of heterozygous mutations in *CYBB*. In addition, a significant percentage of mutations arise *de novo*.³
- Treatment options for CGD include prophylactic antibiotics and interferon- γ therapy.² Although considered risky, stem-cell transplantation offers the prospect of a cure, and has been used successfully in a number of cases.⁵

References: 1. Dinauer MC et al (2000) Hematology (Am Soc Hematol Educ Program) :303-318. 2. Klebanoff SJ (1999) Proc Assoc Am Physicians 111:383-389. 3. Roos D et al (1996) Blood 87:1663-1681. 4. Segal BH et al (2000) Medicine (Baltimore) 79:170-200. 5. Seger RA et al (2002) Blood 100:4344-4350.

Ordering Information: please see other side

Ordering Information for Chronic Granulomatous Disease (CGD) Testing

Indications for Testing

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Ordering Information

Gene	CPT Codes	Test Code
<i>CYBB</i>	83891(1) 83892(1) 83898(13) 83904(26) 83909(26) 83912(1)	100801

Family Testing (single amplicon)

<i>CYBB</i>	83891(1) 83892(1) 83898(1) 83904(2) 83909(2) 83912(1)	100801
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Test Methodology

- Amplification by polymerase chain reaction (PCR); sequencing of entire *CYBB* protein-coding region

Sample Requirements

- For blood samples:
 - 2 mL whole blood in EDTA tube (lavender top)
 - Samples can be stored briefly at 4°C, but should be shipped on day of collection.
- For buccal swab samples:
 - Please contact client services at 1-866-647-0735 for instructions.
- All sample types should be shipped overnight at room temperature.
- To request a sample shipping kit, please call 1-866-647-0735.

Turn-around Times

Turn-around times typically range from 7 to 21 days of receipt of sample and all required forms, but may vary depending on test volume and test-specific technical difficulties. Current TATs are posted on our website. Please schedule patient follow-up appointments for discussion of test results conservatively at 6 weeks.

For more information, please contact Correlagen Diagnostics, Inc., at 1-866-647-0735 or visit us on the web at www.correlagen.com.