

## 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.<sup>1</sup>
- 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,<sup>2</sup> and is characterized by potentially life-threatening bacterial and fungal infections and chronic inflammatory granulomas.<sup>3,4</sup>
- 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*.<sup>3</sup>
- Treatment options for CGD include prophylactic antibiotics and interferon- $\gamma$  therapy.<sup>2</sup> Although considered risky, stem-cell transplantation offers the prospect of a cure, and has been used successfully in a number of cases.<sup>5</sup>

**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	Test Code
<i>CYBB</i>	100801

### Family Testing (single amplicon)

Family Testing is available. Please contact Client Services at 1-866-647-0735 for requirements.

### Test Methodology

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

NOTE: Specimens must be accompanied by a completed consent form. In the case of family tests (ie, known mutations), a copy of the result of the first patient tested in the family (the index case) must be submitted unless that test was performed at Correlagen. Other family members are subsequently tested for the specific mutation found in the first patient tested.

**For test information, sample requirements, or to request a sample shipping kit, please contact Client Services at 1-866-647-0735 or visit us on the web at [www.correlagen.com](http://www.correlagen.com).**