



# TECHNICAL NOTICE

## SOUTH BEND MEDICAL FOUNDATION

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### Celiac-Associated HLA-DQ Typing by PCR

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**Effective Date:** May 1, 2011

**Performing Department:** Molecular Pathology

**Clinical Significance:** Celiac disease (CD; gluten-sensitive enteropathy; celiac sprue) results from an immune-mediated inflammatory process following ingestion of wheat, rye or barley proteins that occurs in genetically susceptible individuals. This results in damage to the small intestinal mucosa and malabsorption of nutrients. CD may present at almost any age, and typically causes abdominal discomfort, diarrhea, and steatorrhea. Other associated problems may include short stature, infertility, recurrent aphthous stomatitis or dermatitis herpetiformis. Occult cases in adulthood may present with fatigue and iron deficiency. However, some patients may be entirely asymptomatic. CD tends to occur in families, and an individual is at higher risk for CD if there are family member(s) who have known CD. Approximately 95% of patients with CD have the HLA-DQ2 hetero-dimer encoded by the DQA1\*05 and DQB1\*02 alleles, while 5% have the HLA-DQ8 hetero-dimer encoded by the DQA1\*03 and DQB1\*0302. Although more than 97% of individuals with CD in the United States have DQ2 and/or DQ8 HLA markers, the presence of either hetero-dimer is not diagnostic for CD since 25 to 40% of US general population has either DQ2 or DQ8. A definitive diagnosis of CD may require a small bowel biopsy which will show characteristic villous atrophy and other supporting histologic features. With the high cost and invasiveness of endoscopy, serologic and genetic tests may be used to identify individuals with a high probability of having CD who may then be considered for additional testing.

**Method:** An extracted DNA sample from patient whole blood is amplified by polymerase chain reaction (PCR) using selected Human Leukocyte Antigen (HLA)-specific primers. LABType® SSO Typing system uses sequence-specific oligonucleotide probes (SSO) bound to fluorescently coded microspheres to identify HLA alleles encoded by the sample DNA using a flow analyzer. The assignment of the HLA-DQA1 and HLA-DQB1 typing is based on the reaction pattern compared to patterns associated with published HLA gene sequences.

**Use:** 1. Assist in the diagnosis of CD by identifying genetic susceptibility to CD in symptomatic individuals. 2. Test may be useful for genetic counseling when a CD patient is identified in a family.

**Reference Range:** DQ genotype: DQ2-; DQ8-

HLA Celiac permissive genes were NOT DETECTED in the patient sample. The presence of Celiac disease is UNLIKELY.

The strongest genetic association of Celiac disease (CD) is with DQ loci in the human lymphocyte antigen (HLA) complex on chromosome 6p21.3. More than 90% of CD patients carry HLA-DQ2 and another 5% share DQ8. Only rare patients carry neither of the HLA susceptible molecules; therefore, an individual negative for the alleles coding the DQ2 and DQ8 dimers is unlikely to have CD.

Although negative for DQ2 and DQ8 essentially rules out the presence of CD, a positive result for DQ2 and/or DQ8 is not diagnostic since 25% to 40% of general population in the US are positive for DQ2 or DQ8. In high-risk individuals, positive DQ2 and/or DQ8 results suggest an increased relative risk of developing CD and periodic serologic screening is recommended.

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Robert J. Tomec, M.D. • *Medical Director*

**Specimen Requirements and Collection:**

**Perferred Volume:** one 5-ml whole blood

**Minimum Volume:** 1 mL of whole blood

**Anticoagulants:** EDTA (lavender), K<sub>2</sub>EDTA (pink) or ACD (yellow)

**Storage/ Transport Temperature:** ambient or refrigerated

**Causes for Rejection:** frozen samples, whole blood collected in heparinized tubes.

**Stability:** Ambient: 3 days; refrigerated: 1 week

**Testing Schedule:** Testing on Monday, results by Friday

**Order:** Celiac- Associated HLA-DQ Typing, by PCR

Test #: 36320 .... CPT: 83891, 83896 x20, 83900, 83901, 83912

For additional information contact Deborah H. Sun, Ph.D. ([dsun@sbfm.org](mailto:dsun@sbfm.org)) or Sally Cornwall, Manager of Flow Cytometry/ Molecular Pathology ([scornwall@sbfm.org](mailto:scornwall@sbfm.org)) or South Bend Medical Foundation, (574) 234-4176 or (800) 544-0925.

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