

Human Leukocyte Antigen B27 (HLA-B*27) Regulating the Immune Response

Human leukocyte antigens (HLA) are a group of highly polymorphic cell surface proteins that are involved in the regulation of the immune response. The presence of HLA-B*27 on human leukocytes (white blood cells) is associated with the prevalence of many inflammatory disorders. HLA-B*27 is associated with many disorders, including ankylosing spondylitis, reactive arthritis (Reiter's syndrome), and acute anterior uveitis.^{1,2}

The HLA-B*27 test provides useful information that may support a diagnosis of certain autoimmune disorders. In the presence of a correlative patient history, including symptoms such as chronic pain, inflammation in the spine, neck, eyes, chest and/or joints, and/or degenerative changes to bones, a positive HLA-B*27 test may support or confirm the diagnosis of conditions such as ankylosing spondylitis, Reiter's syndrome, or sacroiliitis. Modern DNA-based testing for HLA alleles has identified many HLA-B*27 alleles.^{3,4,11} These various HLA-B*27 alleles may or may not correlate with disease states, depending on the geographic, racial, or ethnic background of the individual. For example, HLA-B*27:04 in Asian populations correlates with spondyloarthropathies, but also in the Asian population, HLA-B*27:06 does not have a strong association with spondyloarthropathies.² The HLA-B*27:09 allele also appears not to be associated with ankylosing spondylitis.^{2,5} LabCorp's molecular B27 test differentiates the non-disease-associated-B*27:06 and B*27:09 from other HLA-B27 alleles.

Spondyloarthropathies

Spondyloarthropathic conditions tend to have many overlapping features including (but not limited to): lower back pain due to sacroiliitis,⁶ an asymmetric, peripheral, inflammatory large-joint arthritis,⁶ calcification and inflammation of the tendinous insertions into bones,⁶ uveitis,² and inflammatory bowel diseases.¹⁰ Additional common conditions often considered for HLA-B*27 testing are discussed below.

Ankylosing Spondylitis (AS) — a chronic, progressive inflammatory rheumatic disease involving pain, inflammation, and a gradual stiffening of the spine, neck, and chest.^{6,7} AS is a common disorder, although the severity ranges from asymptomatic to eventual crippling and loss of spinal mobility. Ocular involvement can include conjunctivitis or acute anterior uveitis.⁶ The HLA-B*27 association is one of the strongest in AS and is present in about 90% of AS patients.⁶⁻⁹

Reactive Arthritis (Reiter's Syndrome) — an episodic and relapsing disease characterized by a classic triad, including urethritis, conjunctivitis, and arthritis. This disorder generally occurs between the ages of 15 and 40 and is relatively absent in children.⁶

Psoriatic Arthritis — a form of arthritis occurring in the small joints of the hands that may cause skin and nail lesions, depending on the severity.⁶

Acute Anterior Uveitis (AAU) — a common and recurrent inflammatory condition affecting the front portion of the uvea. Symptoms include eye redness, photophobia, pain, and possible vision reduction. HLA-B*27-associated AAU may be more severe and persistent than idiopathic anterior uveitis.⁶

Inflammatory Bowel Diseases — a group of syndromes typified by recurring bloody diarrhea and abdominal cramps and possible nondestructive arthritis (large joint effusions).⁶

Undifferentiated Spondyloarthropathy — an indistinguishable spondyloarthropathy with manifestations of acute or chronic anterior uveitis, vitritis, retinal vasculitis, and exudative retinal detachment.⁶

Although these conditions are HLA-B*27-associated and the allele's presence is extremely helpful in the diagnosis and therapeutic regime, its absence does not exclude them.⁶ HLA-B*27 disease associations and approximate positive percentages are shown in the table below.

HLA-B*27 Disease Association

Disease	% HLA-B*27 Positive
Ankylosing spondylitis	88%–96% ^{8,9}
Acute anterior uveitis	40%–70% ^{6,9}
Reactive arthritis (Reiter's syndrome)	40%–80% ¹⁰
Aortic regurgitation (with cardiac conduction abnormality)	67%–88% ^{7,9}
Inflammatory bowel disease (with sacroiliitis)	33%–75% ⁹
Psoriatic arthritis (with sacroiliitis)	40%–50% ^{7,9}
Undifferentiated spondyloarthropathies	70% ⁷

Considerable evidence supports a direct role for HLA-B*27 in genetic susceptibility to ankylosing spondylitis (AS) and related spondyloarthropathies (SpA).¹ There is a higher prevalence of this antigen in those affected by spondyloarthropathic conditions, and testing can aid in a differential diagnosis or in establishing the diagnosis of an associated systemic condition.⁶ Testing for these genetic polymorphisms is important, as it may help identify patients who may require more aggressive therapy or control measures and prevent more severe consequences.⁶ The HLA-B*27 polymorphisms map to the major histocompatibility complex on chromosome 6.^{1,3,6}

Relevant Assays*

Test Name	Test Number
HLA-B27 Disease Association	006924

*For the most current information regarding test options, including specimen requirements and CPT codes, please consult the online Test Menu at www.LabCorp.com.

References

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Additional Relevant Studies

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