

# Ankylosing Spondylitis (HLA-B27) Genotyping

## TO CONFIRM ANKYLOSING SPONDYLITIS OR RELATED CONDITIONS IN SYMPTOMATIC PATIENTS

### Disease Overview

- The human leukocyte antigens (HLA) play a central role in the ability of the immune system to recognize self from non-self.
- There is a strong association between the HLA-B27 allele and ankylosing spondylitis (AS).
- AS is a debilitating, chronic, inflammatory condition characterized by lower back pain and stiffness, as well as arthritis in the spine, knees, hips, and shoulders. Other symptoms include fever, fatigue, loss of appetite, weight loss, and anemia.
- AS can result in inflammation and tissue damage in other organs, including the eyes, lungs, heart, and kidneys.
- Confirmation of diagnosis requires characteristic X-ray findings: blurring of bony margins of joints (in early stages), bilateral sacroiliac involvement, patchy sclerosis with superficial bony erosions, eventual squaring of vertebral bodies, and bamboo spine with complete ankylosis.
- Diagnosis of AS is strongly suggested by typical symptoms, a positive family history, and presence of the HLA-B27 antigen.
- The HLA-B27 allele is also associated with Reiter syndrome, anterior uveitis, psoriatic arthritis, and inflammatory bowel disease.

### Epidemiology

- The prevalence of AS in the United States is one in 775.
- Ninety percent of AS patients and 7 percent of the general population are HLA-B27 positive.

### Genetics

- Autosomal dominant with reduced penetrance.
- Males are affected two to three times more often than females.
- HLA-B27 positive individuals who have relatives with AS have a 12 percent risk for developing AS; this is six times greater than for those whose relatives do not have AS, suggesting additional genetic factors may play a role in disease development.

### Indications for Ordering

Patients symptomatic for AS or related autoimmune disorders

### Contraindications for Ordering

- Prenatal testing
- Carrier testing

### Interpretation

- One copy of the HLA-B27 antigen has been shown to be associated with AS and related disorders.
- If the HLA-B27 antigen is not identified, this does not rule out AS, as 10 percent of affected patients are not HLA-B27 positive.

### Methodology

- Polymerase chain reaction (PCR) followed by melting curve analysis.
- Analytic sensitivity and specificity are 99 percent.
- Clinical sensitivity is 90 percent.
- Clinical specificity for unaffected individuals without a family history is less than 1 percent.

### Limitations

- HLA types, other than HLA-B27, will not be detected.
- Rare diagnostic errors can occur due to probe-site mutations.

### References

1. Tiemann C, et al. Rapid DNA typing of HLA-B27 allele by real-time PCR using LightCycler technology. *Clin Lab* 2001;47:131-4.
2. Kilpatrick DC. HLA B27 determination by polymerase chain reaction. *Dis Markers* 1996;12:247-51.
3. Lucotte G, et al. DNA typing of HLA-B27 by polymerase chain reaction. *Mol Cell Probe* 1997;11:313-5.
4. Olerup O. HLA-B27 typing by group-specific PCR amplification. *Tissue Antigens* 1994;43:253-6.

## Test Information

### 0050392 HLA-B27 by PCR & Fluorescence Monitoring

For specific collection, transport, and testing information, refer to the ARUP Web site at [www.aruplab.com](http://www.aruplab.com).

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at [www.arupconsult.com](http://www.arupconsult.com).