



The total solution in autoimmunity.™

## Autoimmune Hearing Loss

ImmcoStripe™ Hsp-70 assay enables detection of 68kD (Hsp-70) antibodies associated with autoimmune hearing loss.

Sensorineural hearing loss (SNHL) is a debilitating condition that affects approximately 15,000 individuals per year, with ~4000 cases reported annually in the United States. SNHL may be caused by a variety of factors. Only 10-15% of cases are linked to a specific cause and the majority of cases elude definitive diagnosis.

Cases with no defined cause are referred to as idiopathic SNHL. Suggested causes of idiopathic SNHL include viral infections, vascular compromise, and intracochlear membrane breaks as well as autoimmunity. Autoimmune hearing loss is a subset of SNHL in which there is a sudden onset, rapidly progressing or fluctuating hearing loss that can be unilateral and often progresses to become bilateral.

Autoimmunity is one of the few causes of hearing loss in which prompt detection of autoantibodies and early intervention may prevent progression of the hearing loss. There are number of disorders associated with hearing loss with symptoms similar to autoimmune hearing loss. This makes the diagnosis of autoimmune hearing loss difficult based on clinical presentation alone. Autoimmune hearing loss may occur as the primary or only manifestation of disease it may be associated with other systemic autoimmune disorders such as rheumatoid arthritis, systemic lupus erythematosus, Granulomatosis with polyangiitis and others.

Autoantibodies have been identified in patients with idiopathic hearing loss include:

- Anti-68kD (Hsp-70) Antibody
- Anti-phospholipid Antibody
- Anti-P0 Antibody
- Anti-Nuclear Antibody (ANA)

### 68 kD (Hsp-70) Antibody Incidence in SNHL

Study Group	Sensitivity	Specificity
Moscicki et al 1994	58%	96%
Hirose et al 1999	42%	91%
Munari et al 2003	84%	93%
Park et al 2006	76%	91%
Bonaguri et al 2007	60%	92%

### Anti-68 kD (Hsp-70) Antibody

Harris and Sharp in 1990 demonstrated by blot that approximately 58% serum samples of patients with sudden SNHL recognized a 68 kD protein in bovine inner ear extract. This 68 kD protein was later identified as Hsp-70. Since then, Hsp-70 antibodies have been recognized as markers supporting diagnosis of autoimmune hearing loss. As levels of anti-Hsp-70 antibody fluctuate with disease activity, the test may also be useful to follow patient response to treatment. Immco Diagnostics, in collaboration with the University of California, San Diego, has standardized this assay to aid in diagnosis of autoimmune hearing loss (**Patent No. US005422282**).

**ImmcoStripe™ Hsp-70** has proven to be valuable laboratory tool for the detection Hsp-70 antibodies associated with autoimmune hearing loss. A recent study reevaluated the accuracy of Hsp-70 IgG as a serology marker for diagnosis of SNHL with strict clinical diagnostic criteria and in comparison with healthy controls (Bonguri et al 2007). The results showed that 52% of disease patients with SHNL have antibodies to Hsp-70 compared to 4% of controls. Immco's assay is superior to other immunoassays for detecting anti-68 kD (Hsp-70) antibodies (Tebo 2007).

## What the experts have to say about anti-68kD (hsp-70) antibodies

**Hirose 1999:** "In patients with a positive blot, a trial of corticosteroid therapy can be given with good conviction because the test is quite specific." *Laryngoscope*. 1999.

**Park et al 2006:** "...serum hsp70 levels might have a clinical role for predicting prognosis of hearing loss in patients with SNHL." *Laryngoscope*. 116:121-125; 2006.

**Tebo et al 2007:** "...anti-hsp70 IgG assay could be of use to detect patients with idiopathic SNHL who may benefit from steroid treatment." – *Clin Chim Acta*. 381:140-44; 2007.

**Bonaguri et al 2007:** "anti-hsp70...is still the only diagnostic marker that identifies an autoimmune origin of hearing loss." *Autoimmunity*. 40:73-78; 2007.

**Prof. Nicola Quaranta:** "...correlation between presence of anti-hsp and hearing recovery are novel and interesting findings." *ENT News* 2008.

## Sample Submission

Specimen collection kits are available free of charge. Please call 1.800.537.8378 or e-mail [info@immco.com](mailto:info@immco.com) for supplies.

Use appropriate tube(s) as follows:

**Serology**.....Orange or clear tube

Specimen can be shipped by courier services, U.S. Postal service and overnight carriers free of charge. Results are reported within two business days of the receipt of the specimen via mail, fax and through Immco online, a HIPAA-compliant web tool at [www.immco.com](http://www.immco.com).

## Why Choose Immco Diagnostics?

- Over 40 years of experience in the field of Autoimmunity with Board Certified pathologists and immunologists
- More than 200 published articles on autoimmune disease diagnostics
- Patented and proprietary technologies
- Lab report within 48 hours of sample receipt via fax, mail or Immco Online, a HIPAA-compliant web tool
- Consultations and second opinions

## Immco Tests

### Code Description

001	ANA titer and pattern on HEp-2 & mouse kidney
003	ANCA Anti-neutrophil cytoplasmic antibody titer
008	Phospholipid antibody; IgG, IgA & IgM
011	Rheumatoid Factor (RF); IgG, IgA & IgM
014	Circulating Immune Complex (CIC)
015	Collagen Type II antibody
340	68kD (Hsp-70) antibodies
350	P0 antibodies
370	SNHL Profile I includes 001, 003, 008, 011, 014, 015, 340, 350
375	SNHL Profile II includes 340, 350

## Selected References

Anonymous (2004). Health information on sudden deafness. National Institutes on Deafness and Other Communication Disorders. <http://www.nidcd.nih.gov/health/hearing/sudden.asp>

Bonaguri C Orsoni JG et al. Anti-68 kDa antibodies in autoimmune sensorineural hearing loss. *Autoimmunity* 2007;40:73-78.

Gross M, Eliashar R, et al. Prevalence and clinical significance of anticardiolipin, anti-beta2-glycoprotein-1, and anti-heat shock protein-70 autoantibodies in sudden sensorineural hearing loss. *Audiol Neurootol*. 2008;13:231-8.

Harris JP, Sharp PA. Inner ear autoantibodies in patients with rapidly progressing sensorineural hearing loss. *Laryngoscope* 1990;100:516-24.

Hirose K, Wener MH, Duckert LG. Utility of laboratory testing in autoimmune inner ear disease. *Laryngoscope* 1999;109:1749-54.

McCabe BF. Autoimmune sensorineural hearing loss. *Ann Otol Rhinol Laryngol* 1979;88:585-9.

Moscicki RA, San Martin JE, et al. Serum antibody to inner ear proteins in patients with progressive hearing loss. Correlation with disease activity and response to corticosteroid treatment. *JAMA*. 1994;272:611-6.

Munari L, Charchat S, et al. An ELISA serum assay for autoantibodies to HSP70 in immune-mediated hearing loss. *J Immunol Methods*. 2003;283:155-61.

Park SN, Yeo SW, Park KH. Serum heat shock protein 70 and its clinical characteristics in patients with sudden sensorineural hearing loss. *Laryngoscope* 2006;116:121-25.

Quaranta N. Sudden sensorineural hearing loss: insights into pathogenesis and treatment. *ENT News* 2008.

Tebo AE, Jaskowski TD et al. Comparison of immune assays for the detection of anti-HSP 70 antibodies in patients with idiopathic sensorineural hearing loss. *Clinica Chimica Acta* 2007;381:140-44.

For details about our products and services, please contact [techsupport@immco.com](mailto:techsupport@immco.com).



The total solution in autoimmunity.™

### United States

Immco Diagnostics, Inc.  
640 Ellicott Street  
Buffalo, NY 14203

+1.716.691.0091  
800.537.8378  
+1.716.691.0466 Fax  
[info@immco.com](mailto:info@immco.com)  
[www.immco.com](http://www.immco.com)