



## MYELIN BASIC PROTEIN (MBP)

### FUNCTION:

Myelin is the protective sheath surrounding nerves. Myelin basic protein (MBP) is believed to be important in the process of myelination, the building of myelin sheaths. Thus, MBP is often a target in the demyelination process in various neuroimmune disorders.

### ANTIBODIES APPEAR:

Multiple sclerosis<sup>2,5</sup>  
 Autism<sup>1</sup>  
 PANDAS / ANDAS / OCD<sup>6</sup>  
 Lupus  
 Toxin exposure

### KNOWN CROSS-REACTIONS:

*Chlamydia pneumoniae*<sup>5</sup>, Herpes - 6<sup>5</sup>,  
 Streptococcal protein<sup>5,6</sup>

### CLINICAL SIGNIFICANCE:

MBP antibodies are detected in various neuroimmune disorders including multiple sclerosis. Consequently, antibodies to MBP are accepted markers of inflammation in various neuroimmune disorders. In possible cases of multiple sclerosis the measurement of antibodies against MBP may predict early conversion to clinically definite multiple sclerosis; in a study by Berger et al patients who were seropositive for both antibodies, anti-MBP and anti-myelin oligodendrocyte glycoprotein, had clinically definite multiple sclerosis within a mean of 7.5 months.<sup>2</sup> To increase the sensitivity and specificity of MS diagnosis, a combination of antibodies, lymphocyte activation or cytokine production assessments along with an MRI, should be utilized.<sup>2,5</sup> Autism Spectrum Disorder (ASD) presents with multiple biomolecular manifestations including neurological dysfunction. Compared to control subjects, ASD patients possess significantly higher levels of anti-brain antibodies, such as MBP, serotonin receptor, and brain endothelial cells or blood-brain barrier.<sup>1</sup> Due to cross-reactivity to Streptococcal protein, MBP antibody is also found in PANDAS (pediatric autoimmune neuropsychiatric disorder associated with group A streptococcal infection), its adult version ANDAS and Obsessive Compulsive Disorder (OCD).<sup>6</sup> Indeed, the similarities of peptide sequences between Streptococcal proteins and MBP result in cross-reactivity. This autoimmune response triggers inflammation via myelin basic protein-specific T-cells, thus compromising the blood-brain barrier.<sup>3,5</sup> A point of interest is that the administration of myelin basic protein artificially increases blood-brain barrier permeability and is under research as a possible treatment for rabies virus, which enters the brain to replicate itself.<sup>4</sup>

### References:

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2. Berger T et al. Antimyelin antibodies as a predictor of clinically definite Multiple Sclerosis after a first demyelinating event. *N Engl J Med*, 2003; 349(2):139-145.
3. Gorgan JL et al. Cross-reactivity of myelin basic protein-specific T cells with multiple microbial peptides: experimental autoimmune encephalomyelitis induction in TCR transgenic mice. *J Immunol*, 1999; 163:3764-3770.
4. Roy A and Hooper DC. Lethal silver-haired bat rabies virus infection can be prevented by opening the blood-brain barrier. *J Virol*, 2007; 81(15):7993-7998.
5. Vojdani A et al. Antibodies to myelin basic protein, myelin oligodendrocytes peptides, -B-crystallin, lymphocyte activation and cytokine production in patients with multiple sclerosis. *J Internal Med*, 2003; 254:363-374.
6. Vojdani A. Obsessive compulsive disorder and differentiation between non-autoimmune OCD and the autoimmune version of the disease called PANDAS. *Latitudes*, 6(2):1-6.