Babesia microti Antigens

Babesia spp. are protozoan parasites of the phylum Apicomplexa, which infect and replicate within erythrocytes, and are the causative agent of babesiosis, a worldwide emerging zoonotic disease. Symptoms associated with babesiosis can range from mild to moderate flu-like symptoms as well as rash, fever, arthralgia and myalgia, although asymptomatic infections are also known. Up to 10% of patients, especially those with a compromised immune system, may suffer from more severe symptoms like jaundice, diffuse ecchymosis, hemoglobinuria, and organ failure (Yabsley and Shock 2013; Vannier *et al.* 2015).

Babesia microti and *B. divergens* are considered the predominant causative agents of babesiosis in North America and Europe, respectively. Like the Lyme disease causing *Borrelia burgdorferi sensu lato* bacteria, *Babesia* parasites are primarily transmitted by ticks of genus *Ixodes* and co-infections can occur (Swanson *et al.* 2006; Vannier *et al.* 2015). In endemic areas of the United States, approximately 20% of these ticks are infected with *B. microti* (Yabsley and Shock 2013; Vannier *et al.* 2015). In addition, infection can occur by blood transfusions, and babesiosis is considered the most common blood-transfusion associated disease. Yabsley and Shock (2013) reported that up to 4.3% of all blood donors from in these endemic areas are serologically positive for *B. microti* (Yabsley and Shock, 2013).

Scientific studies identified a relatively high number of ticks from Southern Germany and Switzerland infected with *B. microti,* indicating that it is likely to have a wider worldwide prevalence (Foppa *et al.* 2002; Eshoo *et al.* 2014). This is supported by the identification of humans in Switzerland and Belgium who were serologically positive for *B. microti*, and a confirmed autochthonous infection in Germany (Foppa *et al.* 2002; Hildebrandt *et al.* 2007; Lempereur *et al.* 2015). Further, *B. microti* has been reported to be the predominant species causing babesiosis in the People's Republic of China (Zhou *et al.* 2014).

Ordering Information			
44100	*Babesia microti* IRA		0.1 mg
44101			1.0 mg
44200	*Babesia microti* p32		0.1 mg
44201			1.0 mg
44000	*Babesia microti* p41	NEW!	0.1 mg
44001			1.0 mg

Screening studies identified *B. microti* antigens useful for immunological assays. These include a 32-kDa secretory protein, *Babesia microti* p32 (Ooka *et al.* 2012), a cytoplasmic interspersed repeat antigen, *Babesia microti* IRA, that comprises three distinct blocks of repetitive amino acids (Cao *et al.* 2013), and *Babesia microti* p41, which was found to be expressed in all of the developmental stages of *B. microti* merozoites (Masatani *et al.* 2013).

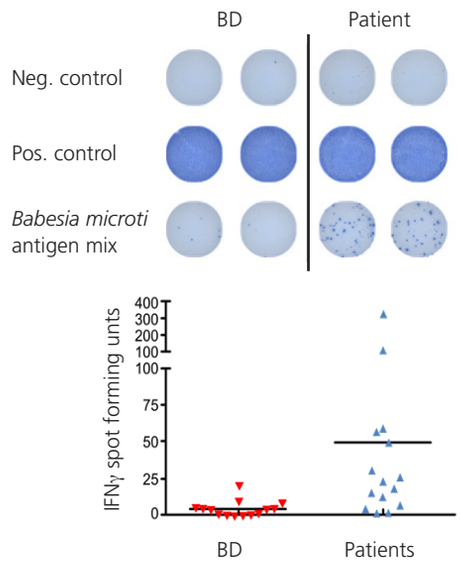

Figure: ELISPOT analysis of T-cells isolated from healthy blood donors (BD) and patients with a suspected Babesia microti infection using a mix of Babesia microti antigens. The top panel shows a representive experimental setup. The lower panel summarizes the number of IFNγ spot forming units determined with this assay.

Babesia microti IRA, p32 and p41 are produced in the baculovirus/insect cell expression system.

References:
Cao *et al.* (2013) Exp Parasitol. 133:346-352
Eshoo *et al.* (2014) Vector Borne Zoonotic Dis. 14:584-591
Foppa *et al.* (2002) Emerg Infect Dis. 8:722-726
Hildebrandt *et al.* (2007) Eur J Clin Microbiol Infect Dis. 26:595-601
Lempereur *et al.* (2015) Clin Microbiol Infect. 21:96.e1-7
Masatani *et al.* (2013) J Vet Med Sci. 75: 967–970
Ooka *et al.* (2012) J Parasitol. 98:1045-1048
Swanson *et al.* (2006) Clin Microbiol Rev. 19:708-727
Vannier *et al.* (2015) Infect Dis Clin North Am. 29:357-370
Yabsley and Shock (2013) Int J Parasitol Parasites Wildl. 2:18-31
Zhou *et al.* (2014) Parasit Vectors. 7:509

In some countries the use of certain antigens in diagnostic tests may be protected by patents. DIARECT is not responsible for the determination of these issues and suggests clarification prior to use.

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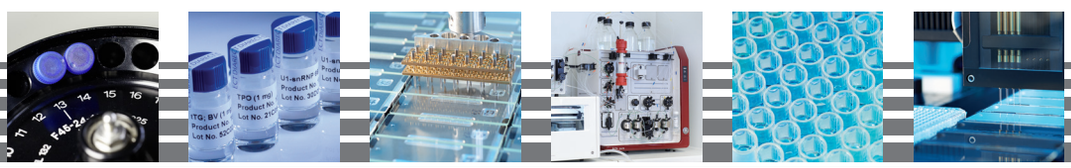

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