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## Molecular and serological evidences of *Midichloria mitochondrii* transmission to vertebrate hosts during the tick bite.

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### Abstract

The tick *Ixodes ricinus* is vector of many pathogens important for human and animal health (Parola and Raoult, 2001; Socolovschi, 2009). *Midichloria mitochondrii* (order Rickettsiales; family Midichloriaceae) is an endosymbiont present in the salivary glands of 100% of *Ixodes ricinus* females. Two lines of evidence suggest a transmission of *M. mitochondrii* in mammals during the tick bite: 1) detection of circulating DNA in blood samples of different animal species; 2) seropositivity toward a *M. mitochondrii* protein (FliD) in humans and dogs exposed to tick bite (Mariconti 2012; Bazzocchi 2013). Here we present serological and molecular results demonstrating the circulation of *M. mitochondrii* also in *Capreolus capreolus* (the host of choice for adult and nymph stages of *I. ricinus*), confirming that this host is a good subject to study the spread of tick-borne pathogens.

Based on these results, FliD protein and other *M. mitochondrii* markers could thus be extremely useful to determine the risk of infection by *I. ricinus* pathogens in given areas, and for investigating the epidemiological association of a variety of pathological alterations with this tick.

Here we show results of the screening of 218 human sera (50 from non endemic areas used as negative controls and 168 from subjects exposed to tick bite) collected in different areas of Germany. Results showed that 48 out of 168 sera were positive to *M. mitochondrii*.

These results have posed the basis for the development of a serological test for investigating the exposure of humans and animals to this tick species.

### References

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