# *IN VITRO* CULTIVATION OF TICK CELLS: A PRACTICAL SYSTEM FOR ISOLATION AND PROPAGATION OF PATHOGENS

**Lygia Maria Friche Passos[1,2*]; E. Zweygarth[1]**

[1]Institute for Comparative Tropical Medicine and Parasitology, Ludwig-Maximilians-Universität München, Leopoldstr. 5, D-80802 Munich, Germany
[2]Departamento de Medicina Veterinaria Preventiva, INCT-Pecuária, Escola de Veterinária-Universidade Federal de Minas Gerais, Belo Horizonte, Brazil [*]lygiapassos@yahoo.com

*In vitro* culture systems of tick cells play an important role in research into vector-borne pathogens, and their advantages are many-fold. More than 50 continuous tick cell lines have been successfully established from several ixodid and argasid tick species and most of them are now available for isolation of pathogens derived from infected humans or animals. The expansion of infected tick cell cultures provides antigenic material which can be produced in reasonably large quantities without the use of *in vivo* species-specific systems. In this paper, taking as examples obligate intracellular bacterial pathogens (e.g. *Anaplasma marginale*, *A. phagocytophilum* and *Ehrlichia* spp.), we describe culture initiation and maintenance, as well as the production of semi-purified live pathogen preparations. Several geographically distinct isolates of *A. marginale* of differing pathogenicity, and more than 40 isolates of *A. phagocytophilum*, derived from cattle, dogs, horses and roe deer have been established and propagated in an *Ixodes scapularis* (IDE8) cell line. In addition, a new ehrlichial agent originally isolated from the haemolymph of Brazilian *Rhipicephalus* (*Boophilus*) *microplus* ticks into IDE8 cells, has been propagated also in canine DH82 cells and bovine aorta cells. Re-infection of IDE8 cells with organisms grown in DH82 cells was achieved. Molecular and phylogenetic analyses of four genes indicated that this tick-derived microorganism is a new species, named *Ehrlichia mineirensis* (UFMG-EV). Our results strengthen the potential of this approach for establishment of *in vitro* propagation systems for tick-borne microorganisms. Thus, this system represents a new tool suitable for the isolation of pathogens and their subsequent propagation, which in turn allows the production of antigenic material for diagnostic tests, antibody and vaccine production, and also for studies on host-vector-pathogen relationships. Last but not least, such systems will contribute to the reduction in usage of animals for experimental research.

Key words: Tick cells, *in vitro* culture, *Anaplasma* spp, *Ehrlichia* spp.

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