

New Tick Defensin Isoform and Antimicrobial Gene Expression in Response to *Rickettsia montanensis* Challenge

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Recent studies aimed at elucidating the rickettsia-tick interaction have discovered that the spotted fever group rickettsia *Rickettsia montanensis*, a relative of *R. rickettsii*, the etiologic agent of Rocky Mountain spotted fever, induces differential gene expression patterns in the ovaries of the hard tick *Dermacentor variabilis*. Here we describe a new defensin isoform, defensin-2, and the expression patterns of genes for three antimicrobials, defensin-1 (*vsnA1*), defensin-2, and lysozyme, in the midguts and fat bodies of *D. variabilis* ticks that were challenged with *R. montanensis*. Bioinformatic and phylogenetic analyses of the primary structure of defensin-2 support its role as an antimicrobial. The tissue distributions of the three antimicrobials, especially the two *D. variabilis* defensin isoforms, are markedly different, illustrating the immunocompetence of the many tissues that *R. montanensis* presumably invades once acquired by the tick. Antimicrobial gene expression patterns in *R. montanensis*-challenged ticks suggest that antimicrobial genes play a role during the acquisition-invasion stages in the tick.