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Cloning and sequencing of the gene encoding the outer surface protein A (OspA) of a European *Borrelia burgdorferi* isolate

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The gene encoding the outer surface protein A (1) of the pathogenic *Borrelia burgdorferi* strain ZS7 (isolated from a female tick of the Freiburg area;2) was obtained by sreening a pUEX expression library using the OspA specific monoclonal antibody LA-2 (3). We present here the nucleotide sequence of a DNA clone, 942 bp long, that contains an open reading frame coding for a protein of 273 amino-acids. The putative ATG initiation site at 121 is preceded by a strong Shine-Dalgarno sequence (nt 107-117). In comparism with the reported restriction map for the OspA gene no differences were observed (4).

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ccaaacttaattgaagttattatcattttatttttttttcaattttctatttgttatttgt    60
taatcttataatataattatacttgtattaagttatattaatataaaaggagaatatatt    120
atgaaaaaatatttattgggaataggtctaatattagccttaatagcatgtaagcaaaat    180
 M  K  K  Y  L  L  G  I  G  L  I  L  A  L  I  A  C  K  Q  N
gttagcagccttgacgagaaaaacagcgtttcagtagatttgcctggtgaaatgaacgtt    240
 V  S  S  L  D  E  K  N  S  V  S  V  D  L  P  G  E  M  N  V
cttgtaagcaaagaaaaaaacaaagacggcaagtacgatctaattgcaacagtagacaag    300
 L  V  S  K  E  K  N  K  D  G  K  Y  D  L  I  A  T  V  D  K
cttgagcttaaaggaacttctgataaaaacaatggatctggagtacttgaaggcgtaaaa    360
 L  E  L  K  G  T  S  D  K  N  N  G  S  G  V  L  E  G  V  K
gctgacaaaagtaaagtaaaattaacaatttctgacgatctaggtcaaaccacacttgaa    420
 A  D  K  S  K  V  K  L  T  I  S  D  D  L  G  Q  T  T  L  E
gttttcaaagaagatggcaaaacactagtatcaaaaaaagtaacttccaaagacaagtca    480
 V  F  K  E  D  G  K  T  L  V  S  K  K  V  T  S  K  D  K  S
tcaacagaagaaaaattcaatgaaaaaggtgaagtatctgaaaaaataataacaagagca    540
 S  T  E  E  K  F  N  E  K  G  E  V  S  E  K  I  I  T  R  A
gacggaaccagacttgaatacacagaaattaaaagcgatggatctggaaaagctaaagag    600
 D  G  T  R  L  E  Y  T  E  I  K  S  D  G  S  G  K  A  K  E
gttttaaaaagctatgttcttgaaggaactttaactgctgaaaaaacaacattggtggtt    660
 V  L  K  S  Y  V  L  E  G  T  L  T  A  E  K  T  T  L  V  V
aaagaaggaactgttactttaagcaaaaatatttcaaaatctggggaagtttcagttgaa    720
 K  E  G  T  V  T  L  S  K  N  I  S  K  S  G  E  V  S  V  E
cttaatgacactgacagtagtgctgctactaaaaaaactgcagcttggaattcaggcact    780
 L  N  D  T  D  S  S  A  A  T  K  K  T  A  A  W  N  S  G  T
tcaactttaacaattactgtaaacagtaaaaaaactaaagaccttgtgtttacaaaagaa    840
 S  T  L  T  I  T  V  N  S  K  K  T  K  D  L  V  F  T  K  E
aacacaattacagtacaacaatacgactcaaatggcaccaaattagaggggtcagcagtt    900
 N  T  I  T  V  Q  Q  Y  D  S  N  G  T  K  L  E  G  S  A  V
gaaattacaaaacttgatgaaattaaaaacgctttaaaataa                      942
 E  I  T  K  L  D  E  I  K  N  A  L  K  *
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