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Hooper

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(54) **PUUMALA VIRUS FULL-LENGTH M SEGMENT-BASED DNA VACCINES**

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(58) **Field of Classification Search** None
See application file for complete search history.

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(57) **ABSTRACT**

The invention contemplates a new synthetic, codon-optimized Puumala virus (PUUV) full-length M gene open reading frame (ORF) that encodes a unique consensus amino acid sequence. The PUUV ORF was cloned into a plasmid to form the first stable PUUV full-length M gene that elicits neutralizing antibodies. The gene can be engineered into a molecular vaccine system, and is useful to protect mammals against infection with Puumala virus.