

Table S1. The PCR primers used in this study. The nucleotides introduced to create restriction enzyme sites are underlined. The sequences encoding the AH1 antigen are bolded.

Primer names	Primer sequences (5'-3')	Products (bp)	Descriptions
LLOup(F)	CGGGGT <u>ACCGG</u> GAGACTTACGCGATATTTTGAAAAAAGG	522	Used for amplifying the upstream and downstream fragments of LLO to construct the LADS-E7 vaccine
LLOup(R)	GCCGCCGGAGCCGCCTTCGATTGGATTATCTACTTTATTACTATATTCGGA		
LLOdn(F)	TCTCAGAAACCATAATTGTAAAAGTAATAAAAAATTAAGAATAAAACCGCTTAA	525	
LLOdn(R)	GGTT <u>CTGCAG</u> AAATCTTTTGCTTCGCAGGAATCTGG		
E7(F)	GGCGGCTCCGGCGGCCATGGAGATACACCTACATTGCATGATATATG	321	Used for amplifying the E7gene to construct the LADS-E7 vaccine
E7(R)	TTACTTTTACAATTATGGTTTCTGAGAACAGATGGGGCA		
LLOup(F)	GGGGT <u>ACCGG</u> GAGACTTACGCGATATTTTGAAAAAAGGC	548	Used for amplifying the upstream and downstream fragments of LLO with AH1 to construct the LADS-AH1 vaccine
LLOup(R)	AAATTGGTGGTAAACATAACTAGGGG AGCCGCCGGAGCCGCCTTCGATTGGATTATCTACTTTATTACTATATTTTCGGATAAAAGCG		
LLOdn(F)	TCCCCTAGTTATGTTTACCACCAATTTT AATTGTAAAAGTAATAAAAAATTAAGAATAAAACCGCTTAACACAC	540	
LLOdn(R)	AAA <u>ACTGCAG</u> AAATCTTTTGCTTCGCAGGAATCTGG		