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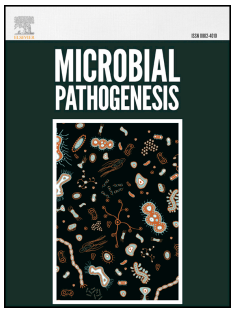

Construction and evaluation of the immune protection of a recombinant divalent protein composed of the MrpA from MR/P fimbriae and flagellin of *Proteus mirabilis* strain against urinary tract infection

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Construction and evaluation of the immune protection of a recombinant divalent protein composed of the MrpA from MR/P fimbriae and flagellin of *Proteus mirabilis* strain against urinary tract infection

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ABSTRACT

Urinary tract infections (UTI) caused by *Proteus mirabilis* are prevalent among the catheterized patients. There is no effective vaccine to reduce the frequency of UTIs caused by *P. mirabilis*. In the present study, the immune responses and effectiveness of different combinations of MrpA and flagellin (FliC) of *P. mirabilis* were assessed intranasally in the mice model. The addition of FliC as adjuvant to MrpA in fusion form significantly raised the mucosal IgA and cellular (IFN-γ and IL-17) responses and maintained the serum IgG responses for 180 days after the first vaccination. Furthermore, MrpA in fusion form with FliC significantly increased the systemic, mucosal and IFN-γ responses of the FliC alone. In a bladder challenge assay with *P. mirabilis*, the fusion MrpA.FliC and the mixture of MrpA and FliC significantly decreased the colony count of the bacteria in the bladder and kidneys of mice in comparison to the control mice. It suggests a complex of the systemic, mucosal and cellular responses are needed for protection of the bladder and kidneys against *P. mirabilis* UTI. In our knowledge, the adjuvant property of the recombinant *P. mirabilis* flagellin was evaluated for the first time in a vaccine combination administered by an intranasal route. Our results suggest the recombinant flagellin of *P. mirabilis* could be used as an intranasal adjuvant in combination with other potential antigens against UTIs.