Evaluation of immunotherapeutic efficacy of Vaccae vaccine and identification of differentially expressed genes in BALB/c mice infected with *Mycobacterium tuberculosis*

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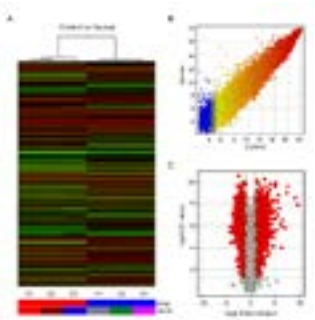
Background: Tuberculosis (TB) is the leading cause from a single infectious agent and one of the top 10 causes of death. *Mycobacterium vaccae* vaccine is the first preventive TB vaccine in phase III trials besides BCG. However, the differentially expressed (DE) genes of host infected with *M. tuberculosis* before and after *M. vaccae* vaccine treatment is still poorly understood.

Methods: In the present study, the immunotherapeutic efficacy of *M. vaccae* vaccine were assessed in BALB/c mice by weight measurement, colony formation units counting, organ coefficient evaluation, and histopathology. The total RNA was extracted from isolated peripheral blood mononuclear cells from BALB/c mice, and the DE genes were identified by microarray, and GO analysis and pathway analysis were performed.

Results: *M. vaccae* vaccine had a significant immunotherapeutic effect in mouse model, and 2,326 upregulated and 2,221 downregulated genes were identified to be DE genes in *M. vaccae* group compared with control group. Additionally, a total of 123 signaling pathways with significant differences were identified, and our speculation suggested that the upregulated and downregulated pathways most related to *M. vaccae* might be MyD88-dependent TLR signaling pathway and PI3K-Akt signaling pathway.

Conclusion: Immunotherapeutic effect of *M. vaccae* might be enhanced via upregulating MyD88-dependent TLR signaling pathway and downregulating PI3K-Akt signaling pathway, which improved our understanding of the mechanism of *M. vaccae* vaccine immunotherapy.



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Biography

Wenping Gong has his expertise in evaluation and passion in developing the novel tuberculosis (TB) vaccine. His research focuses on the screening of specific epitopes and the construction of novel epitope vaccines. He has participated in many international academic conferences and delivered speeches. So far, he has published ten SCI papers in international academic journals. His work shed light on the prevention and treatment of the spread of TB, and opened new ideas for the development of new TB vaccines.

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