8. Summary

Boosting the efficacy of Bacillus Calmette–Guérin (BCG) for protection against *Mycobacterium tuberculosis*

TB disease has created an alarming signal after being ranked as the most deadly disease in the world. The cumbersome therapy, generation of drug resistance and BCG failure in the TB endemic area indicates the necessity to develop new vaccines. The use of peptide-based vaccine has provided a benefit over whole cell-based vaccination. Keeping this in mind, we generated a multi T cell epitope-based DNA vaccine and checked its potency to boost the efficacy of BCG. In the present study, the C6 DNA vaccine bolstered the efficacy of BCG against *Mtb*. The BCG+C6 vaccination generated antigen specific T cells in the animals as evident by the T cell proliferation. Further, BCG+C6 administration augmented the generation of memory T cells better than BCG alone. The generated immune response was Th1 type as there was increase in IFN-γ and TNF-α secretion in culture supernatants. Moreover, we observed reduced IL-10 secretion with BCG+C6. Furthermore, boosting BCG vaccine with C6 enhanced the activation of DCs and macrophages. The BCG+C6 vaccination improved the protection efficacy of BCG as the *Mtb* burden in lungs and spleen were significantly reduced. In future, priming with BCG and boosting its efficacy with C6 can be an important vaccine candidate to control TB.