

Comparison of Several Maturation Inducing Factors in Dendritic Cell Differentiation

Saeid Abediankenari^{1*}, Yousef Yousefzadeh¹, Hossein Azadeh¹, Mohammad Vahedi¹

¹Department of Microbiology and Immunology, Mazandaran University of Medical Sciences, Sari, Iran

ABSTRACT

Background: Dendritic cells (DCs) are professional antigen presenting cells that have an important role in the initiation of immune response. The use of maturation factors in dendritic cell differentiation provides a promising approach in immunotherapy. **Objective:** In this study, we compared tumor necrosis factor- α , polyribocytidylic acid, lipopolysaccharide and CpG oligonucleotides in inducing dendritic cell maturation. **Methods:** We generated immature dendritic cells with GM-CSF in combination with IL-4 from peripheral blood mononuclear adherent cells and used tumor necrosis factor- α , polyribocytidylic acid, lipopolysaccharide and CpG for the induction of dendritic cell maturation. CD83 maturation marker on the dendritic cells was analyzed by flowcytometry after 7 days. In addition, mixed leukocyte reaction between dendritic cells and T cells was performed by MTT proliferation assay. **Results:** Flow cytometry results demonstrated a comparable high level of CD83 expression on the mature dendritic cells generated by TNF- α , CpG, Poly I:C, and LPS treatment of the immature dendritic cells. However, a significantly poorer proliferation of lymphocytes cocultured with the Poly I:C-treated DCs was observed compared to the CpG-treated DCs in mixed leukocyte reaction ($p=0.026$). Conversely, a significantly stronger proliferation of lymphocytes was observed when cocultured with TNF- α -treated DCs compared to the LPS-treated DCs ($p=0.025$). **Conclusion:** Our results indicated that all of studied maturation inducing factors can be used in DC maturation but TNF- α and CpG were the preferred in vitro maturation factors. It is concluded that maturation of dendritic cells by CpG motif and TNF- α can be used to regulate immune responses.

Keywords: CpG, Dendritic Cells, LPS, TNF- α

*Corresponding author: Dr. Saeid Abediankenari, Department of Microbiology and Immunology, Mazandaran University of Medical Sciences, Sari, Iran, Tel: (+) 98 912 1985667, e-mail: abedianks@razi.tums.ac.ir