

## The *Cronobacter sakazakii* ESP2949-1 phage induces dendritic cell maturation via activation of nuclear factor- $\kappa$ B and IL-12p40 in murine bone marrow

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Bacteriophages can be operated as highly immunogenic antigens, which could interact with dendritic cells as antigen presenting cells. The bacteriophage ESP2949-1 is a lytic phage of *Cronobacter sakazakii* which has been isolated from sewage samples. Unlike other phages that were researched as therapeutic agents for many diseases, the ESP2949-1 phage has never been clearly examined for therapeutic purpose. To evaluate its therapeutic effect, the production of the proinflammatory cytokines TNF- $\alpha$ , IL-6, IL-1 $\alpha$ , and IL-1 $\beta$ , the expression of the dendritic cell maturation markers CD86 and CD40, and the underlying of NF- $\kappa$ B signaling pathways in murine bone marrow-derived dendritic cells (BM-DCs) in response to ESP2949-1 phage infection were studied. The bacteriophage ESP2949-1 affected the expression of the cell surface molecules and proinflammatory cytokines that are related with the DC maturation processes. Treatment with ESP2949-1 phage also induced the NF- $\kappa$ B-IL12p40 signaling pathways. Our chromatin immunoprecipitation assay (ChIP) showed that p65 could bind the IL12-p40 promoter via translocation to the nucleus which indicates the activation of NF- $\kappa$ B signaling. Furthermore, the ESP2949-1 phage induced the promoter activity of IL-12p40. Our ChIP assay also revealed that p65 was enriched at the IL12-p40 promoter as a direct target of chromatin. The present study demonstrates that the ESP2949-1 phage potently induces DC maturation via immune-enhancement processes.

### Biography

Hyo-Ihl Chang has completed his PhD in 1987 from North Carolina State University. He has been Professor of College of Life Sciences and Biotechnology, Korea University since 1988. He was a dean of College of Life Sciences and Biotechnology, Korea University. He has published more than 80 papers in reputed journals. Now he is a President of the Korean Society for Microbiology and Biotechnology.

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