

## Novel Method for Rapidly Generating Mature Dendritic Cells from Peripheral Blood Monocytes and Myeloid Precursors

Dendritic cells (DC) play a critical role in the generation of adaptive immune responses. Dendritic cells excel at presenting antigen to naive T lymphocytes. Large numbers of highly active DC are necessary for prevention and/or treatment of cancer and infectious diseases. Current processes for generating mature DC from peripheral blood mononuclear cells (PBMC) involve incubating PBMC with GM-CSF plus IL-4 for one week followed by monocyte-conditioned medium for two to seven days. These processes are inefficient, expensive and do not uniformly generate DC with full functional activity.

FDA inventors discovered a use of CpG oligodeoxynucleotides (ODN) to generate mature dendritic cells (DC). The CpG ODNs have synergistic uses with cytokines, chemokines, or other factors to induce the maturation of monocytes to dendritic cells. The current invention is based on the observation that bacterial DNA and synthetic ODNs containing unmethylated "CpG motifs" promote the maturation of murine antigen presenting cells (APC) *in vitro*.

### Potential Commercial Applications

- Novel method to generate DC by adding "D" ODN to normal human PBMC

### Competitive Advantages

- DC generated in 24 hours compared to current method that requires more than 2 weeks
- Novel method is cheaper and more efficient than current method

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### Publications:

- Klinman et al., CpG oligodeoxynucleotides induce human monocytes to mature into functional dendritic cells, *European Journal of Immunology*, 2002, Vol.32(9), p.2617-2622. PMID: [12207346](#)
- Ishii, K. J., et al. Genomic DNA released by dying cells induces the maturation of APCs. *J Immunol*. 2001 Sep 1;167(5):2602-7. PMID: [11509601](#)

### Intellectual Property:

- United States Patent [No. 7,354,909](#) issued 04.08.2008
- United States Patent [No. 7,959,934](#) issued 06.14.2011
- Related International Filings, PCT Application [No. PCT/US02/25732](#)

**Product Area:** DC antigenic immune response, dendritic cell generation

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