

## Immunostimulatory Oligodeoxynucleotides

This invention comprises oligodeoxynucleotides (ODNs) having at least 10 nucleotides with an unmethylated central CpG motif that are immunostimulatory in humans. The inventors have shown that the several ODNs (having different CpG motifs and backbones) induce immune responses from human non-B and B cells. The motif that stimulates non-B cells induces production and release of multiple T cell cytokines and chemokines; specifically, the Th1 cytokine IFN-gamma, which facilitates the development of a cytotoxic T cell response.

In contrast, the motif that stimulates B cells induces production and release of various cytokines, including IL-6 which supports a Th2 antibody response. The inventors have *in vitro* and *ex vivo* data showing the ODNs of this invention can be used to precisely regulate the type and magnitude of the immune response in human cells

### Potential Commercial Applications

- Cancer therapeutic
- Anti-infective agent and in combination with antisense therapy
- Treating autoimmune disorders

### Competitive Advantages

- Two distinct hexameric motifs that are active on human cells
- Stimulation of B and non-B cells

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**Publications:** Klinman DM, Klaschik S, Tomaru K, Shirota H, Tross D, Ikeuchi H. Immunostimulatory CpG oligonucleotides: Effect on gene expression and utility as vaccine adjuvants. *Vaccine*. 2010;28(8):1919-1923. PMID: [20188247](https://pubmed.ncbi.nlm.nih.gov/20188247/)

### Intellectual Property:

United States Patent [No. 7,960,356](#) issued 06.14.2011  
United States Patent [No. 6,977,245](#) issued 12.20.2005  
United States Patent [No. 8,030,285](#) issued 10.04.2011  
United States Patent [No. 8,389,495](#) issued 03.05.2013  
United States Patent [No. 8,227,446](#) issued 07.24.2012  
United States Patent [No. 8,741,869](#) issued 03.06.2014  
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**Product Area:** Cancer therapeutic, vaccine adjuvant, autoimmune therapeutic, antisense therapy

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