**Catalog nr**
HC4041 (lot number and expiry date are indicated on the label)

**Description**
ODN 2395 is a prototype of the class of CpG-C oligodeoxynucleotides (ODN) and is particularly effective at activating B- and NK cells and inducing IFN-alpha production in vitro of human peripheral blood mononuclear cells (PBMC).

The vertebrate immune system has evolved innate immune defense pattern recognition receptors (PRRs) that detect unmethylated cytosine-phosphate-guanine (CpG) motifs within bacterial DNA. Cellular activation by CpG motifs occurs via the Toll signal pathway. The Toll-like receptor-9 (TLR9, CD289) appears to be a major component of the CpG-DNA receptor, acting by direct binding to CpG-DNA, which triggers the induction of cell signaling pathways including the mitogen activated protein kinase (MAPKs) and NFκB, leading to stimulation of various cells of the immune system. The human TLR9 is expressed in B cells and plasmacytoid dendritic cells (PDC). Mice also express TLR9 in the myeloid compartment. Optimal sequences for activating TLR9 vary among species. Synthetic ODN contain CpG-DNA motifs mimicking the immunostimulatory effects of bacterial DNA and can, therefore, be used as immunoprotective agents, vaccine adjuvants and anti-allergic agents. CpG ODN also affects immune tolerance and autoimmunity. Different classes of CpG ODN are characterized each with distinct effects on the immune response: CpG-A ('D'-type), CpG-B ('K'-type), and CpG-C.

CpG-C ODN combines the immune effects of CpG-A and -B ODN since they induce strong B-cell activation comparable to CpG-B together with IFN-alpha secretion as CpG-A ODN. Furthermore NK cells isolated from peripheral blood and cultured with CpG-C ODN, in the presence of either IL-12 or IL-8, express higher levels of CD69 as compared to those stimulated with ether CpG-A or CpG-B ODN. Moreover, NK cells cultured with CpG-C ODN displayed higher cytolytic activity against tumor cell lines. In contrast to CpG-A, CpG-C ODN has a complete phosphorothioate (PS) backbone without poly-G motifs, but contains like CpG-A palindromic sequences combined with stimulatory CpG motifs. In vivo studies demonstrate that CpG-C are very potent Th1 adjuvants. Since CpG-C ODN combine the immune effects of both CpG-A and CpG-B, CpG-C might have broader immune therapeutic effects in different tumor types and infectious diseases in which a combination of A- and B-class ODN would be desirable. The prototype sequence of a CpG-C is the 22-mer ODN 2395 that is able to modulate the immune response in both human and mice. It has the following sequence: 5’-tcgc-tgctttcgccgcgcgc-3’. Regular letters represent PS linkage and bold letters represent CpG dinucleotides.

**Formulation**
Approximately 200 nmol lyophilized, purified 22-mer CpG ODN. The exact amount is indicated on the label. Endotoxin levels are undetectable. Reconstitute the vial by injection of distilled or deionized water, volume depending on the concentration to be used.

**Application**
CpG-C DNA can be used in biological assays in vitro to activate cells. Furthermore, CpG-C DNA can be used as an immune modulating agent.

**Use**
For in vitro stimulation, 0.05 to 3 µM can be used. It is recommended that users test the reagent and determine their own optimal concentrations.

**Storage and stability**
Lyophilized product should be stored at 4°C. Store stock solution in aliquots at ~20°C. Repeated freeze and thaw cycles will cause loss of activity. Under recommended storage conditions, product is stable for one year.

**Precautions**
For research use only. Not for use in or on humans or animals or for diagnostics. It is the responsibility of the user to comply with all local/state and Federal rules in the use of this product. Hycult Biotech is not responsible for any patent infringements that might result with the use of or derivation of this product.

**References**
3. Jurk, M et al; C-class CpG ODN: sequence requirements and characterization of immunostimulatory activities on mRNA level. Immunobiology 2004, 209: 141
OLIGODEOXYNUCLEOTIDES
HUMAN AND MOUSE CpG-C DNA
Prototype ODN 2395

Also available
HC4034  Non-CpG DNA; 200 nmol
HC4037  Human and mouse CpG-A oligodeoxynucleotides, prototype ODN 2216; 200 nmol
HC4038  Rabbit CpG oligodeoxynucleotides, prototype ODN 2007; 200 nmol
HC4039  Human and mouse CpG-B oligodeoxynucleotides, prototype ODN 2006; 200 nmol
HC4040  Rat CpG-B oligodeoxynucleotides; 200 nmol
HC4042  Non-CpG DNA (rabbit), prototype ODN 2041; 200 nmol
HM2087  Monoclonal antibody against human TLR9 (CD289), clone 5G5