CNE-CPO Vaccine Adjuvant

Cationic **N**ano **E**mulsion Vaccine Adjuvant

Product information

CNE-CPO vaccine adjuvant is a squalene oil-in-water emulsion containing cationic components.

CNE-CPO is available in two quantities. #CNE1000 1mL; #CNE5000 5mL.

Storage and stability

Shipping and storage: **CNE-CPO** is shipped at RT and stored at +4°C. **CNE-CPO** is stable for 1 year. DO NOT FREEZE.

Description

CNE-CPO is an oil-in-water Cationic Nano Emulsion made of squalene droplets and cationic polymers in a continuous aqueous phase. It is biodegradable, which is an important advantage over alternative oils that have been used in emulsion adjuvants, like Freund's adjuvant that contains mineral oil (paraffin oil) and has long term persistence in the organism. CNE induces local stimulation and recruitment of DCs and granulocytes, differentiation of monocytes into DCs and increased uptake of antigen by DCs. The emulsion acts more specifically on macrophages present at the site of injection. A local increase of chemokines released also influences the recruitment of immune cells from the blood to the site of vaccination, creating an amplification loop. This formulation enhances differentiation of monocytes towards a mature phenotype, thereby promoting migration of antigen-loaded cells to the draining lymph node. Compared to aluminum salts, a stronger immune response is elicited (e.g higher antibody "humoral response, Th2" and T-cell response "cellular response Th1") with a mixed and more balanced Th1/Th2 cell phenotype.

The cationic components that compose this nano-emulsion make it a genetic adjuvant that allows the association with plasmid DNA to form an efficient nanoparticle delivery system (NPD). NPD are **non-viral gene delivery systems**, self-assembled from cationic entities and negatively charged immunogen that function as **vaccine carrier**.

CNE-CPO adjuvant is compatible with most immunization procedures: such as intramuscular, intraepidermal, intravenous, intraperitoneal or subcutaneous.

- **Plasmid DNA**

Cationic formulation-mediated antigen-coding plasmid DNA has been shown to greatly improve humoral and cell-mediated immunity. One of the possibilities is that these DNA vaccines could facilitate uptake of the plasmid by antigen-presenting cells (APC) and induce cytotoxic T lymphocyte response. Moreover, once entrapped into nanoparticles, DNA is protected from nucleases and depending on their size, some NPD may break down locally to release their vaccine content slowly; the accessibility of genetic material is thus prolonged.

Results

Results presented below demonstrate the effect of CNE adjuvant on immune system response:

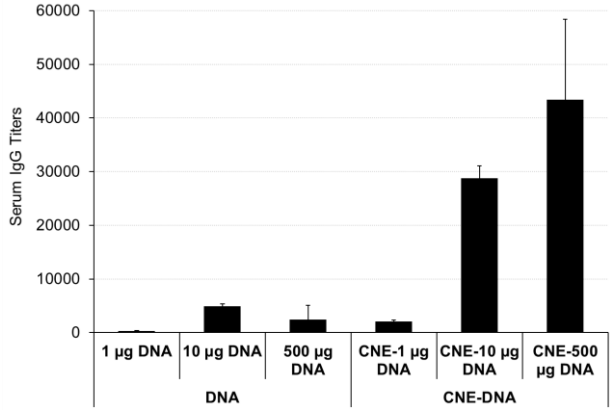

Figure 1. Comparison of immune response in mice and rabbits injected with naked- or CNE-DNA at either 1, 10 or 500 µg. Sera were analyzed by ELISA. Adapted from G. Ott *et al. J. Control. Release*, 2002; 79(1-3), 1-5.

Method/protocol

Recommendations before starting:

The inoculum should be free of extraneous microbial contamination; use plasmid DNA as pure as possible. Adapt volumes according to the table 1 below.

1. Allow CNE adjuvant and immunogen solutions to reach room temperature before beginning.
2. Shake gently the CNE vial before opening.
3. Dilute immunogen/DNA/RNA in saline buffer or phosphate buffer for a final concentration of 10-100 µg/100 µL.

It is mandatory to not use buffer containing serum.

4. Mix CNE adjuvant with an equal volume of immunogen/DNA/RNA solution for a 1:1 ratio.
5. Pipette up and down several times to ensure correct mixing.
6. Incubate at room temperature for 20-30 min.
7. Inject into the animal according to the table below.

NOTE: do not store the complexes: discard solution after use. Prepare fresh LPD before each immunization

Volume (mL) for injection depends on the site of injection and the animal model. Typical routes of administration include intramuscular (IM), subcutaneous (SC), intradermal (ID) or intraperitoneal (IP).

Species	I.M.	S.C.	I.D.	I.P
Mice, hamsters	0.05-0.1	0.1-0.2	0.025	0.5
Guinea pigs, rats	0.1-0.2	0.2-0.4	0.025	1.0
Rabbits	0.25	0.25	0.025	10
Pigs	0.25-0.5	0.5	0.5	50

Table 1: Recommended volumes (mL) for injection of immunogen/ adjuvant mixtures per site of injection for different animal species (Adapted from Leenars MPPA, Hendriksen CFM et al., 1999).

References and background reading

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Purchaser Notification

Limited License

The purchase of the CNE-CPO Vaccine Adjuvant grants the purchaser a non-transferable, non-exclusive license to use the included components. This reagent is intended for in-house research only by the buyer. Such use is limited to the transfection of nucleic acids as described in the product manual. In addition, research only use means that this formulation is excluded, without limitation, from resale, repackaging, or use for the making or selling of any commercial product or service without the written approval of OZ Biosciences.
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Product Use Limitations

The CNE-CPO Vaccine Adjuvant is developed, designed, intended, and sold for research use only. It is not to be used for human diagnostic or included/used in any drug intended for human use. All care and attention should be exercised in the use of the component by following proper research laboratory practices.

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