Vaccine Adjuvants

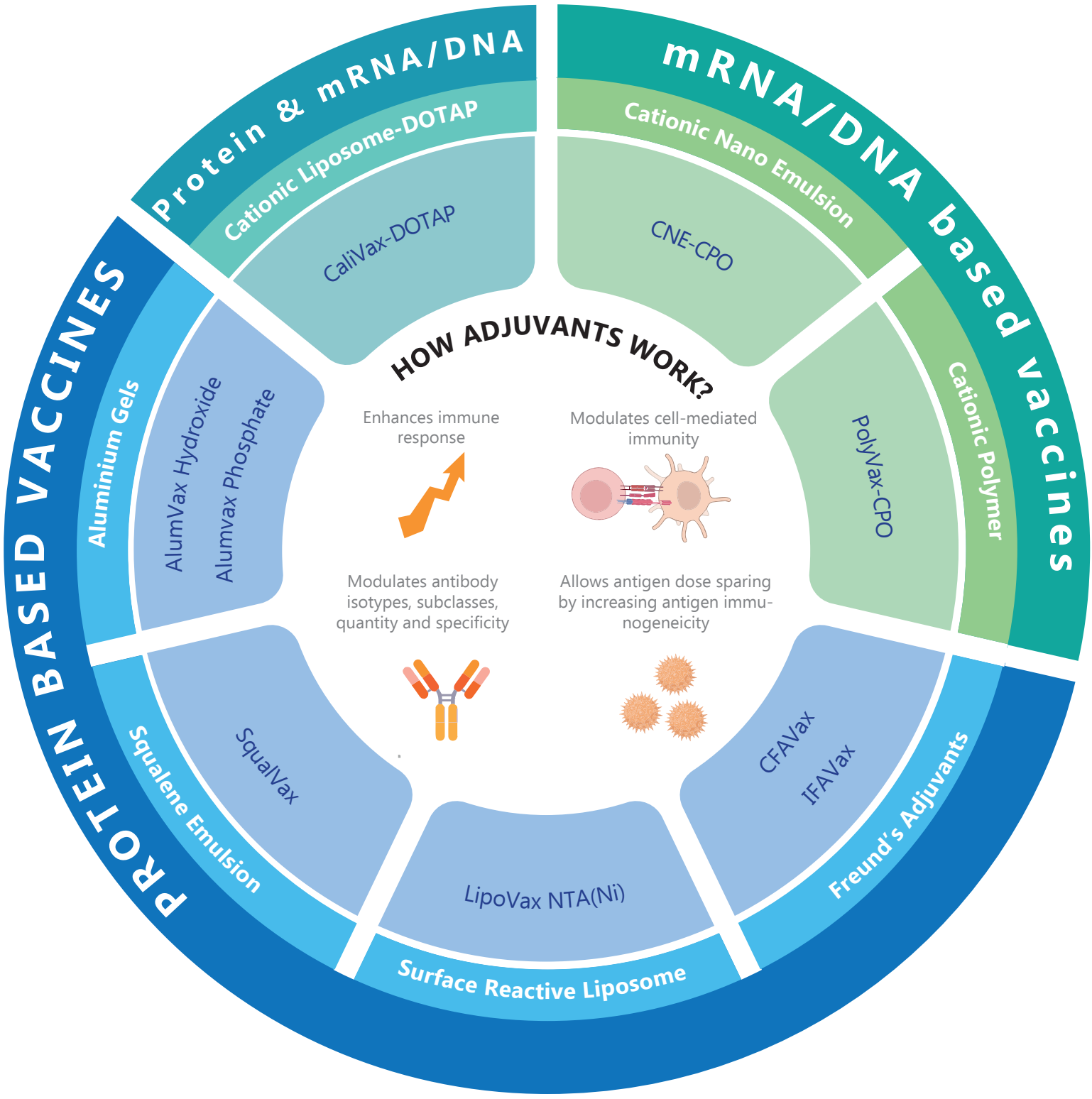
RESEARCH GRADE ADJUVANTS FOR PROTEIN BASED VACCINES AND mRNA/DNA VACCINES

afaq ISO 9001 Qualité
AFNOR CERTIFICATION

OZ BIOSCIENCES

VACCINE ADJUVANTS

FOR VACCINATION RESEARCH



PROTEIN BASED VACCINES

Aluminium Gels

AlumVax Hydroxide

AlumVax Hydroxide is a wet gel (colloidal) of aluminum hydroxide 2%, provided as a ready-to-use suspension.

- **Crystalline** aluminum oxyhydroxide that is **positively charged** at physiological pH (pI=11), suitable for adsorption of **negatively** charged proteins (such as albumin).

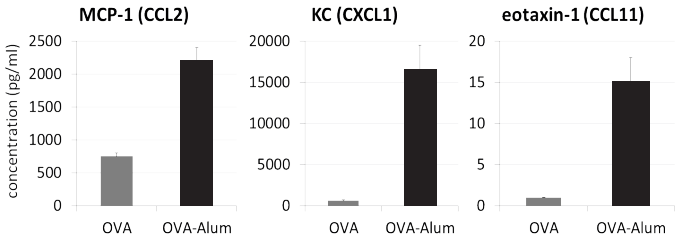


Figure 1. Response of innate immune system cells to injection of Ag +/- Alum Adjuvant.

Alumvax Phosphate

AlumVax Phosphate: is wet gel (colloidal) of aluminum phosphate 2%, provided as a ready-to-use suspension.

- **Amorphous** aluminum hydroxyphosphate which is **negatively charged** at physiological pH (pI=5–7), suitable for adsorption of **positively** charged or neutral proteins.

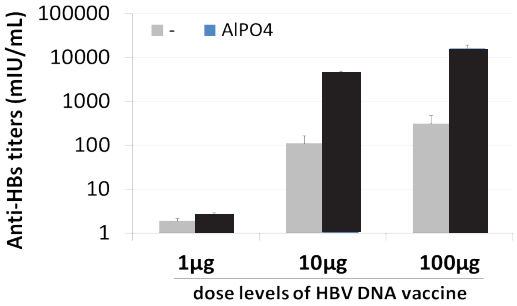


Figure 2. Adjuvant effect of AlPO4 for HBV DNA

- **Stimulates Th2 response** through the release of Th2-associated cytokines (IL4, IL-5, IL-13…) and Th2-associated antibodies (IgG1 & IgE).
- **Increases Ag-specific CD4+ T Cell proliferation** and promotes NALP3 inflammasome activation and caspase 1-mediated release of IL-1 and IL-18.

Recommanded for
Stimulation of Th2 response, Antibodyproduction

PROTEIN BASED VACCINES

Squalene Emulsion

SqualVax

SqualVax is an **oil-in-water emulsion** made of squalene droplets in a continuous aqueous phase similar to MF59®.

- Fully **biodegradable.**
- Induces local stimulation and recruitment of DCs and granulocytes, differentiation of monocytes into DCs and increased uptake of antigen by DCs.
- Acts more specifically on macrophages present at the site of injection.
- Enhances differentiation of monocytes towards a mature phenotype, thereby promoting migration of antigen-loaded cells to the draining lymph node.

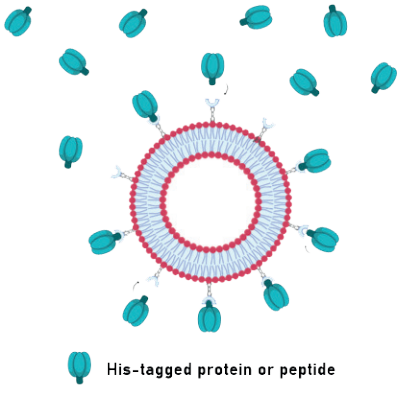
Recommanded for
Stimulation of Th2 response preferentially with a balanced Th1/Th2 cell phenotype

Surface Reactive Liposome

LipoVax NTA(Ni)

LipoVax NTA(Ni) is a **Ni2+-based liposome adjuvant** that can anchor diverse **histidine-tagged proteins** or peptides to an antigen-presenting carrier to trigger immune response (immunization, vaccination, antibody generation).

- Contains phospholipid, cholesterol and nickel-chelating lipid (60:39:1), showing high affinity to bond with electron-rich ligand such as histidine.
- Compatible with most immunization procedures: such as intramuscular, intraepidermal, intravenous, intraperitoneal or subcutaneous



Recommanded for
Vaccine carrier

PROTEIN BASED VACCINES

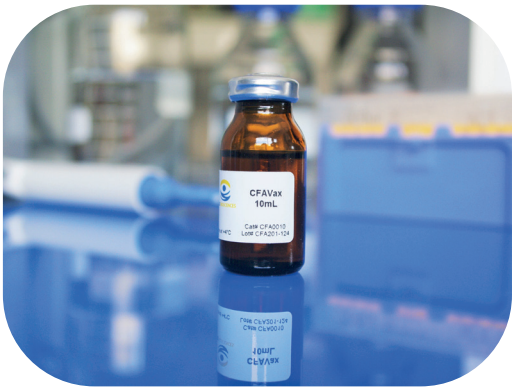
Freund's Adjuvants

- Freund's adjuvants carry molecular patterns specific to bacteria, sometimes called PAMP (Pathogen Associated Molecular Patterns), and are able to activate non-specific defense mechanisms.

CFAVax

CFAVax (Complete Freund's Adjuvant) is a water-in-oil emulsion containing 1 mg per mL heat-killed **Mycobacterium tuberculosis.**

- Induces **Th1 response**



Recommanded for
Stimulation of Th1 response, initial immunization, antibody production

IFAVax

IFAVax (Incomplete Freund's Adjuvant) is a water-in-oil emulsion **without** addition of heat-killed mycobacteria (Mycobacterum butyricum).

- Primes **Th2 response**

Recommanded for
Stimulation of Th2 response, subsequent immunization, antibody production

Cationic Liposome-DOTAP

CaliVax-DOTAP

CaLiVax-DOTAP is a **cationic lipid-based composition for liposome-mediated mRNA, DNA or protein vaccines**.

- Average size of 100 nm
- DOTAP cationic lipid composing this genetic adjuvant allows the formation of complexes with mRNA, plasmid DNA or antigen protein to form an **efficient lipoplexes-based nanoparticle delivery system (LPD)**.
- Compatible with most immunization procedures such as intramuscular, intraepidermal, intravenous, intraperitoneal or subcutaneous.

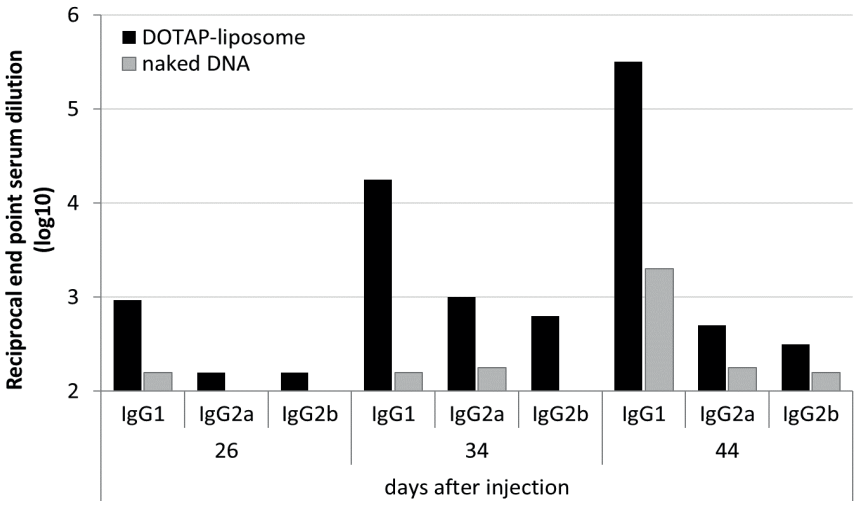


Figure 4. Comparison of immune response in mice injected with naked or DOTAP-liposome entrapped DNA. Sera were tested at the indicated days post intramuscular injection and analyzed by ELISA.

Recommanded for
Vaccine carrier

mRNA,DNA BASED VACCINES

Cationic Nano Emulsion

CNE-CPO

CNE-CPO is an **oil-in-water Cationic Nano Emulsion made of squalene droplets and cationic polymers** in a continuous aqueous phase.

- **Biodegradable**.
- Induces local stimulation and recruitment of DCs and granulocytes, differentiation of monocytes into DCs and increased uptake of antigen by DCs.
- Acts more specifically on macrophages present at the site of injection.
- Enhances differentiation of monocytes towards a mature phenotype, thereby promoting migration of antigen-loaded cells to the draining lymph node.
- Compatible with most immunization procedures: such as intramuscular, intraepidermal, intravenous, intraperitoneal or subcutaneous.
- Stronger immune response elicited compared to aluminium salts with a mixed and more balanced Th1/Th2 cell phenotype

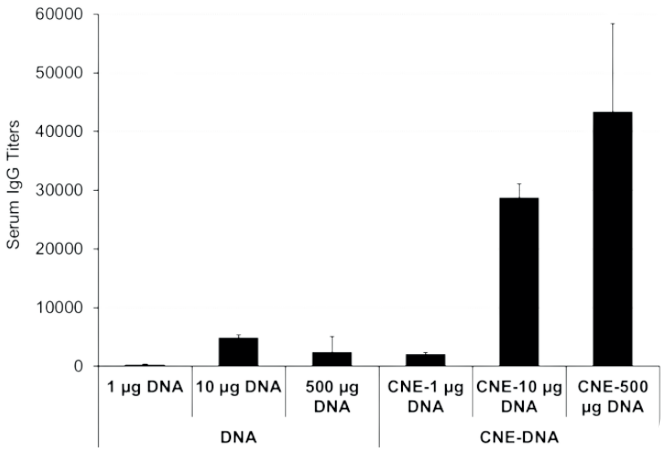


Figure 5. Comparison of immune response in mice and rabbits injected with naked- or CNE-DNA at either 1, 10 or 500 µg. Cationic formulation-mediated antigen-coding plasmid DNA has been shown to greatly improve humoral and cell-mediated immunity.

Recommanded for
Vaccine carrier, boost immunization

Cationic Polymer

PolyVax-CPO

PolyVax-CPO (Cationic Polymer-based) is a **cationic polymer genetic adjuvant** that associates with **mRNA & plasmid DNA** to form an efficient **polymer-based nanoparticle delivery system** (NPD).

- Compatible with most immunization procedures: such as intramuscular, intraepidermal, intravenous, intraperitoneal or subcutaneous.

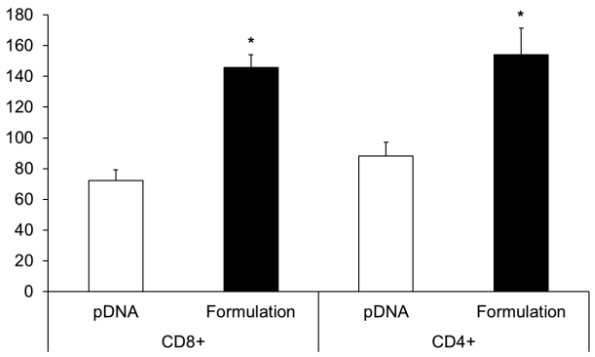


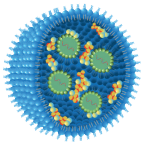
Figure 6. Humoral immune response after IM injection (10 µg pDNA per injection) with and without the formulation

Recommanded for
Vaccine carrier, boost immunization

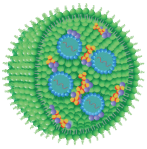
ADDITIONAL PRODUCTS

LIPID NANOPARTICLE (LNP)

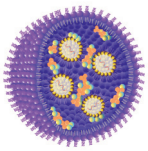
Ready-to-use NanOZ-LNP/mRNA products



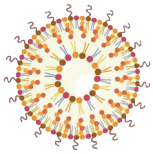
- NanOZ LNP-mRNA(GFP)



- NanOZ LNP-mRNA(Luc)



- NanOZ LNP-mRNA(OVA)



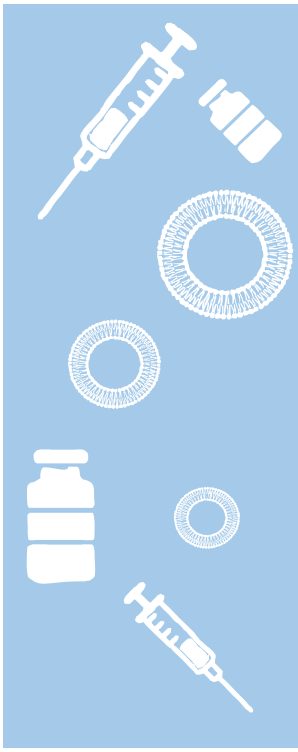
- NanOZ empty-LNP

Custom service

» OZ Biosciences has developed a **Microfluidics Platform** for the reproducible development of **safe & potent drug delivery vehicles** for pharmaceutical applications.

» We can support **every stage** of your mRNA-LNP production, **from mRNA synthesis to LNP formulation development, manufacturing and fill & finish.**

» For any of **RNA, DNA or APIs encapsulation,** you can provide us with your molecule of interest and we will formulate it into LNPs.



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The art of delivery systems

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