in vivo nucleic acid delivery reagent

in vivo-jetPEI®

Polyplus transfection® THE DELIVERY EXPERTS

Different quality grade reagents to fit your needs from R&D to the Clinic

- Successful *in vivo* delivery of any nucleic acid
- Multiple modes of administration to target different organs
- No detectable inflammatory response triggered
- Used for therapeutics and clinical trials worldwide

Summary

in vivo-jetPEI®, a cationic polymer-based reagent, is a very powerful non-viral vector to safely and easily deliver nucleic acids *in vivo*, through different routes of administrations. It offers high performance in terms of efficiency, reproducibility and robustness. Nowadays, *in vivo*-jetPEI® is widely used for nucleic acid delivery in animals, and was selected as the delivery vector of choice in several drug development programs. It is now used worldwide for a growing number of therapies based on nucleic acid delivery.

Polyplus-transfection® offers different quality grades *in vivo*-jetPEI® reagents to fit your needs from R&D to clinical applications.

Successful *in vivo* delivery of DNA, siRNA, miRNA, oligonucleotides and mRNA

in vivo-jetPEI® is the reagent of choice to deliver any type of nucleic acid to mediate gene expression or gene silencing in various tissues. The success of this delivery system relies on its ability to efficiently deliver the appropriate nucleic acid into the target tissue or cells with low toxicity and limited immune response.

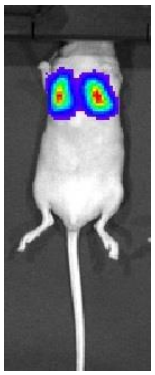

Fig. 1: Protein expression following plasmid DNA systemic delivery using *in vivo*-jetPEI®. Bioluminescent imaging of luciferase expression in living Nude mouse using IVIS 100 camera (Caliper-PerkinElmer) 24 h after gene delivery. pCMVLuc (50 µg) was complexed with *in vivo*-jetPEI® in 400 µl of 5% glucose solution and injected into the tail vein.

Multiple modes of administration to target different organs

The stability of *in vivo*-jetPEI®/nucleic acid complexes allows the use of numerous routes of administration including systemic or local injection.

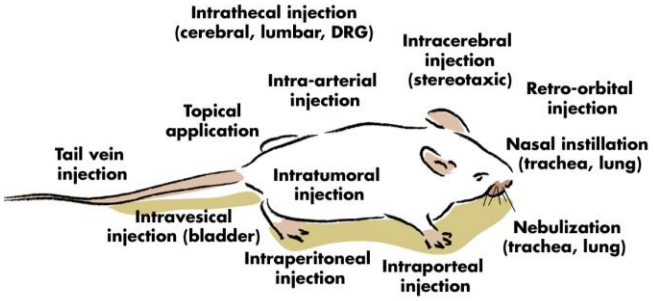

Fig. 2: Examples of delivery routes using *in vivo*-jetPEI® in mouse.

The route of administration largely determines the targeted organ. For example upon intravenous injection, *in vivo*-jetPEI®-mediated DNA delivery leads to gene expression mainly in the lung but also in the liver, pancreas, spleen, kidney, heart, bladder and artery.

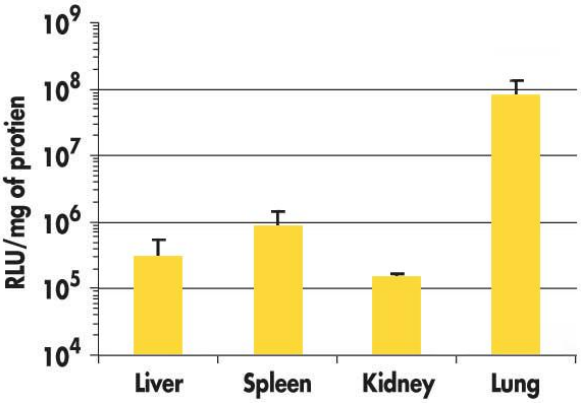

Fig. 3: Organs targeted following systemic nucleic acid delivery using *in vivo*-jetPEI® in mice. pCMVLuc (50 µg) was complexed with *in vivo*-jetPEI® in 400 µl of 5% glucose solution and injected into the tail vein. 24 h after gene delivery, organs were extracted and luciferase level in each organ was analyzed using a luciferase assay and expressed relative to the amount of total proteins.

Suitable for any animal model and in Human

in vivo-jetPEI® is ideal for nucleic acid delivery in mice. However, the protocol is so easy and versatile that it has been adapted to many other species including rodents, non-rodents, marine organisms, non-human primates. In addition, this reagent was selected for several drug development programs in Human.

in vivo nucleic acid delivery reagent

in vivo-jetPEI®

No detectable inflammatory response triggered

Following *in vivo*-jetPEI® -mediated systemic delivery of nucleic acid, there is no induction of major pro-inflammatory cytokines and no increase in sera levels of hepatic enzymes (Bonnet et al. (2008), Pharm Res, 25:2972). Hence, *in vivo*-jetPEI® offers a reliable and safe alternative to viral vectors that can elicit an immune response.

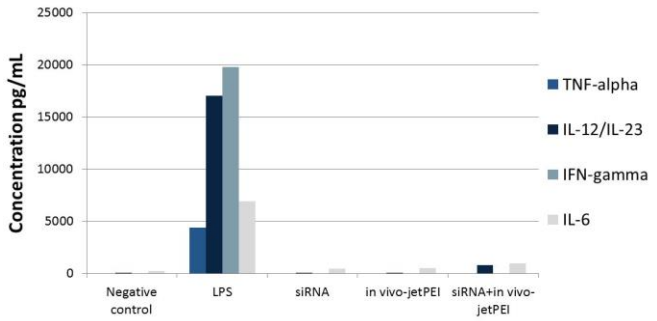

Fig. 4: No pro-inflammatory cytokine induced following intravenous delivery of nucleic acid/ *in vivo*-jetPEI® complexes. A siRNA (40 ug) was delivered with or without *in vivo*-jetPEI®. The level of TNF-α, IL12/IL23, IFNγ and IL6 was measured 1h, 6h, 12h and 6 h after delivery, respectively. The negative control is glucose only, the positive control is an IP injection of *E. coli* LPS (50 µg).

Nucleic acid/ *in vivo*-jetPEI® complexes stable over time

Complexes formed between nucleic acids and *in vivo*-jetPEI® do not form aggregates over time and thus are stable for at least 24 h at RT, 37 °C and up to 1 month at 4°C.

With stable complexes, the nucleic acid is protected for longer, thereby allowing the preparation of complexes in advance or the use of osmotic pump infusion systems.

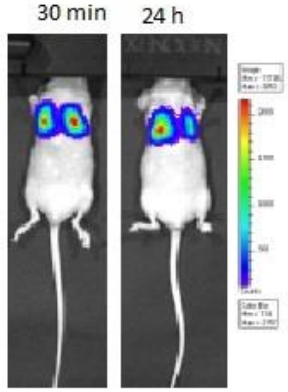

Fig. 5: nucleic acid/*in vivo*-jetPEI® complexes are stable over time. pCMVLuc (40 µg) was complexed with *in vivo*-jetPEI®. Complexes incubated for 30 min or 24 h at 4 °C were intravenously injected. Bioluminescent imaging of the animals was performed using IVIS100 bioimaging system (Caliper-PerkinElmer) 24 h after injection.

Used for therapeutics and clinical trials worldwide

in vivo-jetPEI® has been selected as a delivery vector for several drug development programs due to its safety and delivery efficiency. To fulfill all the quality requirements associated to the use of our reagent in Human, Polyplus-transfection® supplies preclinical grade reagents, as well as cGMP grade *in vivo*-jetPEI® that are currently used in several ongoing preclinical studies and phase I and II clinical trials.

	Research grade	Preclinical grade	Clinical grade
Manufacturing			
Fully synthetic molecule	√	√	√
In compliance with GMP guidelines			√
Quality Controls			
Potency	√	√	√
Identity	√	√	√
Safety		√	√
Purity			√

Table 1: Comparison between different quality grades *in vivo*-jetPEI® reagents.

Ordering information

Product	Cat N°	Reagent	Glucose solution
in vivo-jetPEI®	201-10G	0.1 ml	10 ml
	201-50G	0.5 ml	2 x 10 ml

0.1 ml of *in vivo*-jetPEI® is sufficient to perform up to 20 intravenous injections in mouse (40 µg of DNA per injection).

Bulk quantities available upon request.
Preclinical and clinical grade reagents available upon request.

For additional information, please contact our technical support at www.polyplus-transfection.com.

Polyplus-transfection SA
BIOPARC, 850 Boulevard S. Brant
67400 Illkirch, France
Phone: + 33 (0)3 90 40 61 80
Fax: + 33 (0)3 90 40 61 81