# CombiMag Results

Magnetofection™ is a novel, simple and highly efficient method to transfect cells in culture and in vivo. It exploits magnetic force exerted upon gene vectors associated with magnetic particles to drive the vectors towards, possibly even into, the target cells. In this manner, the complete applied vector dose gets concentrated on the cells within a few minutes so that 100% of the cells get in contact with a significant vector dose.

This has several important consequences:

1. Greatly improved transfection rates in terms of percentage of cells transfected compared to standard transfections.
2. Up to several thousand folds increased levels of transgene expression compared to standard transfections.
3. High transfection rates and transgene expression levels are achievable with extremely low vector doses, which allow saving expensive transfection reagents.
4. Extremely short process time in comparison to standard procedures. A few minutes of incubation of cells with gene vectors are sufficient to generate high transfection efficiency.

OZ Biosciences offers three types of ready-to-use reagents: **PolyMag** designed for all nucleic acids, **SilenceMag** specific to siRNA delivery and **CombiMag**. **CombiMag** is a nanoparticles formulation designed to be combined with any commercially available transfection reagent (such as cationic polymers and cationic lipids) or with viruses. **CombiMag** has been used successfully with all type of nucleic acids associated to a transfection reagent and with adenovirus and retrovirus.

## Nucleic Acid Types and Viruses

| Nucleic Acid or Virus Type | PolyMag | SilenceMag | CombiMag |
|---|---|---|---|
| **DNA (plasmid)** | √ | NA | √ |
| **Oligonucleotides** | √ | ND | √ |
| **mRNA** | √ | ND | √ |
| **siRNA** | √ | √ | √ |
| **dsRNA** | ND | √ | √ |
| **shRNA** | ND | √ | √ |
| **Adenovirus** | NA | NA | √ |
| **Retrovirus** | NA | NA | √ |

## Cell Types

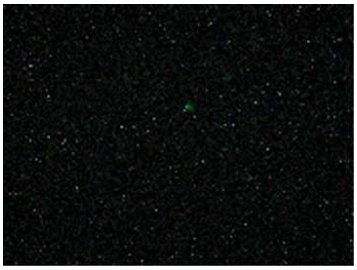
**CombiMag** is generally applicable on numerous cell types. This technology has been tested successfully on a variety of immortalized cell lines as well as primary cells.

## Transfection of Primary Cells

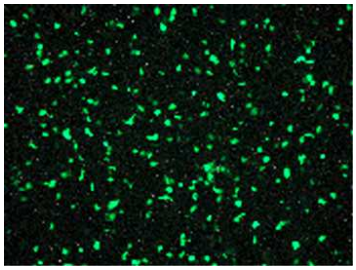
**Primary Human Keratinocytes**
Transfected with a commercial reagent F +/- **CombiMag**
*Reporter Gene: GFP*

We are grateful to the laboratories of Dr. C. Plank (Technical University, Munich) for kindly providing these data.

**Standard Transfection**



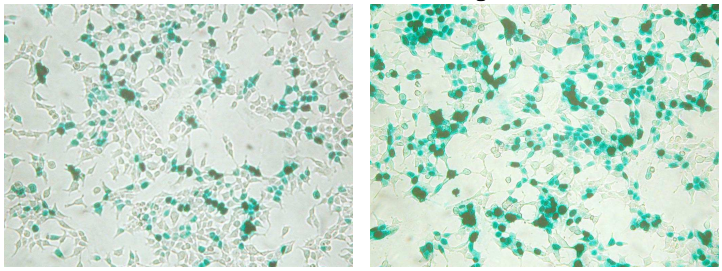
**Magnetofection™**



**Primary Chondrocytes / Pig**
Transfected with a commercial reagent F +/- **CombiMag**
*Reporter Gene: -galactosidase*

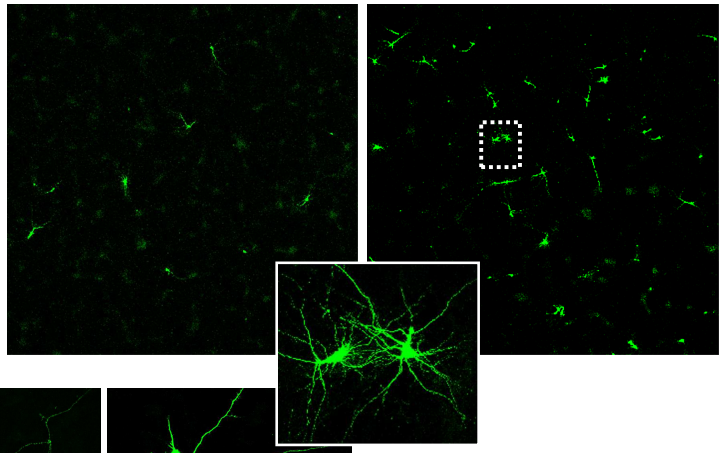
We are grateful to the laboratories of Dr. C. Plank (Technical University, Munich) for kindly providing these data.

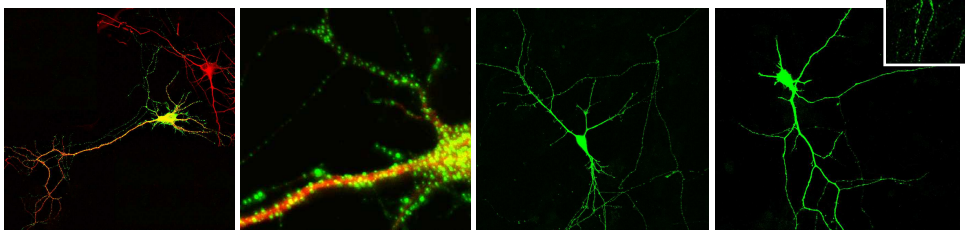
**Standard Transfection** **Magnetofection™**



**Primary Rat Hippocampal Neurons**
Transfected 14 d.i.v., with a commercial transfection reagent L +/- **CombiMag**
*Reporter Gene: GFP*
*Culture dish: 35 mm*
*DNA: 1 g / well*

We are thankful to Dr. Igor Medina (INSERM U29, Marseille) for kindly providing these data.

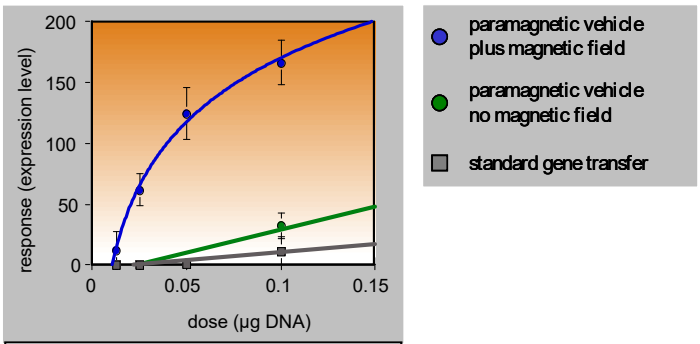




*"CombiMag give us reliable and improved transfection efficiency up to 300% enhancement"*
*Dr. I. Medina*

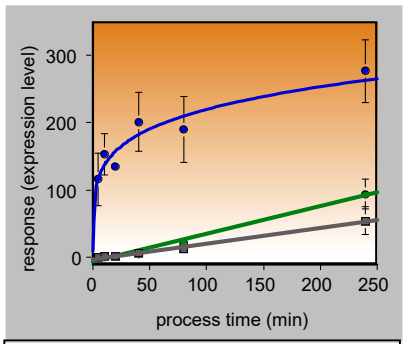
## Nucleic Acid Dose Response and Transfection Kinetics

**Save Materials**




**DNA dose response profile.**
NIH-3T3 cells were transfected with a commercial transfection reagent L +/- **CombiMag** with and without the magnetic field for 15 min. Luciferase expression was assayed after 24 hours.

**Save Times**

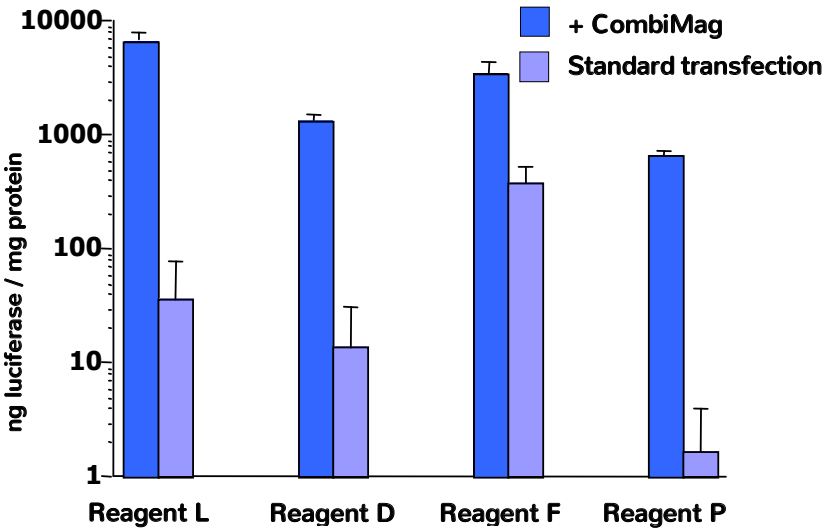



**Transfection kinetics** NIH-3T3 cells were incubated with a commercial transfection reagent G ± **CombiMag** with and without positioning on the magnetic plate for the indicated time spans. Luciferase expression was assayed after 24 hours.

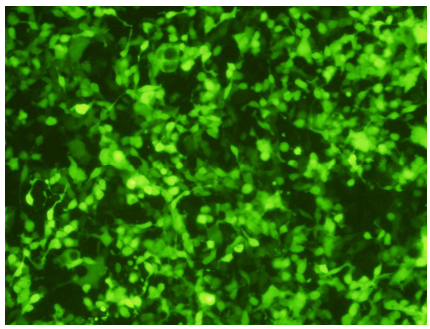
## Effect of CombiMag on various commercial transfection reagents

**Primary Rabbit Articular Chondrocytes** transfected with various commercial transfection reagent +/- **CombiMag**
*Reporter Gene: Luciferase*
*Culture dish: 96-well plate.*

We are grateful to Dr. U. Schillinger (Munich) for kindly providing these data.

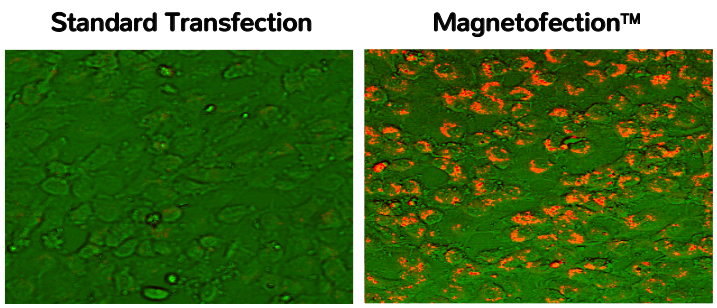



**HT1080 (Human Fibrosarcoma)** transfected with a commercial transfection reagent L +/- **CombiMag**
*Reporter Gene: GFP*



## Delivery of Oligonucleotides

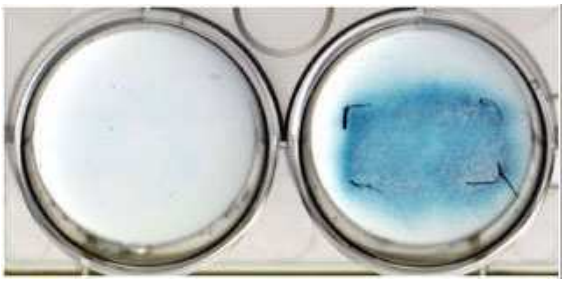
**HUVEC-C (Primary) / Human**
Transfected with a commercial reagent E +/- **CombiMag**
Fluorescent Oligonucleotides
*Culture dish: 24-well plate*
*ODN: 200 ng / well*
We are grateful to Dr. F. Kroetz (Ludwig-Maximilians University, Munich) for kindly providing these data.



## Infection of non permissive cells with CombiMag plus Adenovirus

**NIH 3T3 cells** (lacking CAR) were infected with a recombinant adenovirus (coding for LacZ) +/- **CombiMag** in the presence (right) and in the absence (left) of permanent magnets positioned under the culture plates. Similar results were obtained with K562 cells and human peripheral blood lymphocytes.

We are grateful to the laboratories of Dr. C. Plank and Dr. M. Anton (Technical University, Munich) for kindly providing these data.



## Enhancement of Infectivity with CombiMag

**NIH 3T3 cells** were infected with a low titer preparation of MuLV (Murine Leukemia Virus) +/- **CombiMag** in the presence and in the absence of magnetic field. **Conditions**:

1- Standard Transduction
2- + Polybrene
3- + Polybrene + CombiMag (no magnetic field)
4- + CombiMag (no magnetic field)
5- + Polybrene + CombiMag + magnetic field
6- + CombiMag + magnetic field

We are grateful to Dr. A. Kruger (Institute of Experimental Oncology, Munich) for kindly sharing these data.