



# **MATra**

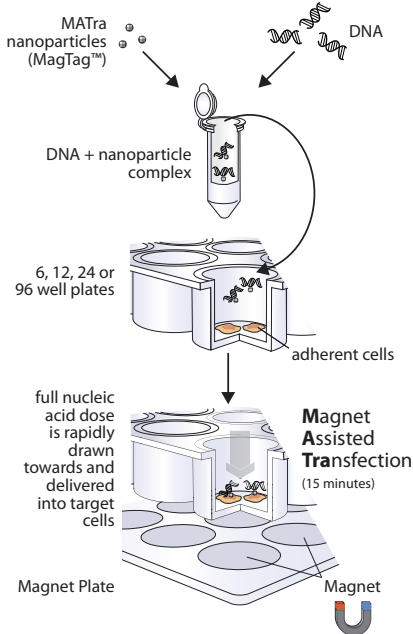
Magnet Assisted Transfection

**IBA's best newcomer product of the year 2004 in Germany...  
...now on its way to global success**

- Tested to work for almost 100 different cell lines!
- Small investment for a great improvement in transfection efficiency!

# Magnet Assisted Transfection (MATra) TAGnology

## MATra principle



Magnet Assisted Transfection (MATra) is a new, easy-to-handle, very fast and highly efficient technology to transfect cells in culture. All types of nucleic acids from plasmid DNA or siRNA to oligonucleotides can be used with the MATra approach. Data from a variety of species using cell lines or primary tissue culture have accumulated including human, monkey, mouse, rat, xenopus, pig, cat or fish. Using this new technique, nucleic acids are in a first step associated with specific magnetic nanoparticles (MagTag™). Exploiting magnetic force the full nucleic acid dose is then drawn towards and delivered into the target cells leading to efficient transfection without disturbing the membrane architecture, without causing chromosomal damage or leaving a hole in the cell membrane like other transfection technologies. Two approaches are possible: for a standard Magnet Assisted Transfection “MATra-A Reagent” is used; for more critical cells it is also possible to combine the MATra technology with lipofection (“Magnet Assisted Lipofection”). For this purpose, we are offering “MA Lipofection Enhancer” and the new high-efficiency lipofection reagent “IBAflect”.

Both techniques can be used with adherent cells as well as with suspension cells. However, for suspension cells, cells have to be localized at the bottom of the wells of cell culture plates to take advantage of the magnetic field in an optimal way. For this purpose cells can be immobilized temporarily (using MATra-S Immobilizer) or modified culture vessels can be used. MATra can also be adapted to high-throughput transfection assays using robotic stations and adapted protocols.

### Easy protocol (example with MATra-A)

1. Dilute nucleic acid in medium
2. Add magnetic nanoparticle (MATra-A)
3. Incubate 20 – 30 minutes
4. Add medium to adherent cells (2 – 4 x 10<sup>5</sup> cells)
5. Place culture plate on magnet plate
6. Add nucleic acid/nanoparticle solution
7. Incubate 15 minutes
8. Remove magnet plate

### Type of nucleic acid/virus suitable for MATra

- Plasmid DNA
  - Antisense oligonucleotides
  - siRNA
- MA Lipofection Enhancer only:
- Adenovirus
  - Retrovirus

## Advantages compared to standard transfections

- Easy protocol
- Up to several thousand fold increased levels of transgene expression after short-term incubation with the transfection reagent
- Functional with serum and serum-free
- Successfully used on many cell lines (see page 5)
- No need for expensive instruments (like electroporator or particle gun)
- Highly cost-effective

## Methods and Reagents

Standard cells		Critical cells	
Adherent	Suspension	Adherent	Suspension
	Use MATra-S Immobilizer to make the cells adherent		Use MATra-S Immobilizer to make the cells adherent
Use MATra-A Reagent to transfect adherent cells efficiently*		Enhance your lipofection with MA Lipofection Enhancer combined with IBAfect**	
<b>Magnet Assisted Transfection</b>		<b>Magnet Assisted Lipofection</b>	

We recommend using both procedures in parallel (Magnet Assisted Transfection and MA Lipofection) to determine the optimal method for your particular cells of interest.

\* The loading of MATra-A reagent with DNA has to be performed under serum-free conditions while the DNA loaded MATra-A Reagent can be applied to the cells in the presence of serum.

\*\* Or any commercially available transfection reagent based on polycations or lipids

# The Reagents

## MATra-A Reagent

...contains magnetic nanoparticles which can be loaded with the nucleic acid of interest. Exploiting magnetic force the full nucleic acid dose is then rapidly drawn towards and delivered into the target cells leading to efficient transfection. MATra-A can be used for adherent cells; for suspension cells see MATra-S Immobilizer.

## MA Lipofection Enhancer

Transfection with common lipidic or polycationic reagents can be enhanced by magnetic assistance ("MA Lipofection"). In this case, the nucleic acid to be transfected has to be combined with MA Lipofection Enhancer in the presence of a common transfection reagent. The formulation of MA Lipofection Enhancer, which also contains magnetic nanoparticles, has been optimized for use with IBA's new lipofection reagent IBAfect (see below). The MA Lipofection Enhancer can be used for adherent cells; for suspension cells see MATra-S Immobilizer.

## MATra-S Immobilizer

Suspension cells have to be made adherent first by incubating them with the magnetic reagent MATra-S Immobilizer. Then MATra-A Reagent (or MA Lipofection Enhancer with IBAfect) loaded with the nucleic acid can be applied and MATra (or MA Lipofection) can be performed.

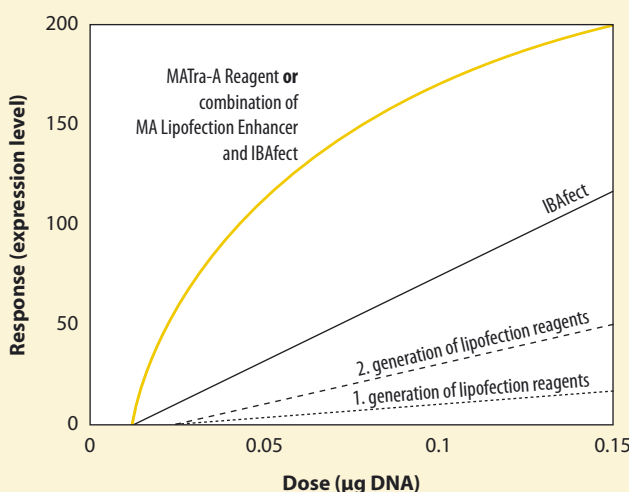
## IBAfect

IBAfect is a pentacationic transfection reagent based on DNA/RNA/lipid-complex technology. The specifically designed molecular structure of the cationic lipid ensures easy entry of DNA/RNA into cells by condensing DNA/RNA to compact structures (DNA/RNA/lipid-complex) efficiently entering the cell by endocytosis. The DNA/RNA/lipid-complexes act like "proton sponges" which causes lysis of the endosome. Nucleic acids are released simultaneously from the complex by "**Progressive Proton-assisted Lipid Layer Disintegration**" (P.P.L.L.D.).

IBAfect is provided as a ready-to-use solution. It shows no serum inhibition, which makes it a reagent of choice for transfecting sensitive cell lines. IBAfect is recommended to be combined with IBA's MA Lipofection Enhancer (see above).

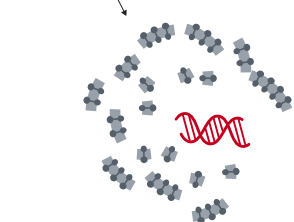
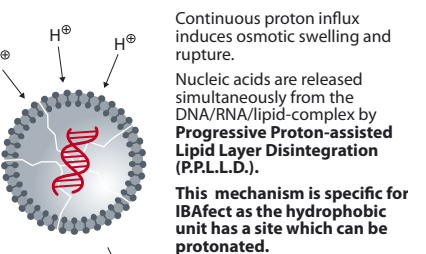
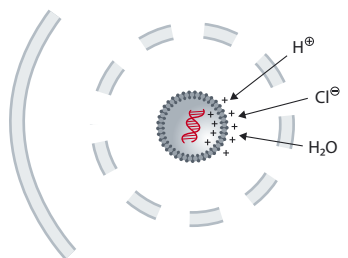
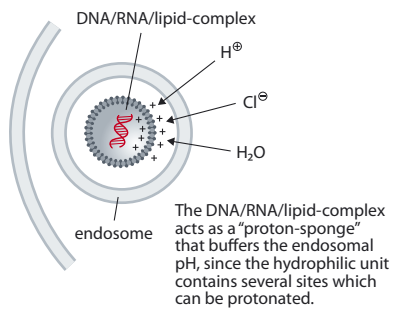
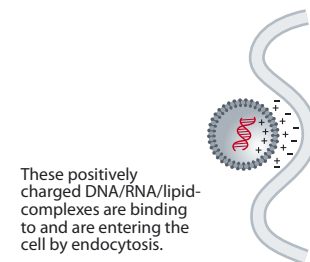
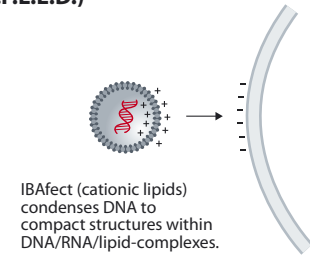
**We recommend trying MATra-A and the MA Lipofection Enhancer (with IBAfect) in parallel to find the optimal solution for your cells of interest!**

## Low vector doses



Magnet Assisted Transfection and lipofection in comparison. Luciferase expression was assayed after 24 hours.

## IBAfect principle: Progressive Proton-assisted Lipid Layer Disintegration (P.P.L.L.D.)



# Examples and Applications

## Mouse fibrosarcoma cells transfected with GFP plasmid



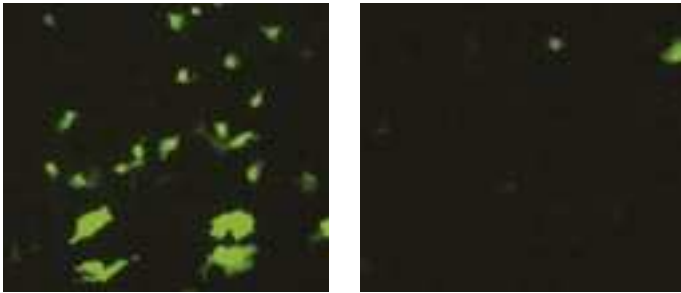
Phase contrast      GFP fluorescence      Overlay

Magnet Assisted Transfection (MATra) of L929 fibrosarcoma cells.  $1 \times 10^5$  L929 cells were seeded on poly-L-lysine coated glass coverslips and allowed to grow for 24 h. Subsequently, the cells were transfected with 1  $\mu$ g of an expression vector coding for green fluorescent protein (GFP) as described in the standard protocol for MATra. 48 h after transfection, the cells were fixed with 4% (w/v) paraformaldehyde and expression of GFP was visualized by confocal laser scanning microscopy.

**Transfection efficiency was 60–80% (see overlay).**

(Data kindly provided by Dr. Lutz Thon and Dr. Dieter Adam, Institut für Immunologie, Universitätsklinikum Schleswig-Holstein Campus Kiel, Kiel, Germany)

## Human hepatocellular carcinoma cells transfected with GFP plasmid



MATra-A      Competitive lipofection reagent

Magnet Assisted Transfection of hepatocellular carcinoma cells (Hep G2) was compared to lipofection. Transfections with pCG-IRES-GFP (own construct) were carried out in 96 well plates according to standard protocols without medium change. Cells were fixed with 2% PFA 24 hours post transfection for fluorescence microscopy. Confluency ~80–90%.

**MATra shows much higher transfection efficiency than competitive lipofection reagent.**

(Data kindly provided by Michael Schindler, University Ulm, Microbiology and Virology, Ulm, Germany)

## Neurons transfected with eGFP plasmid



Primary hippocampal neurons (E14) were grown on 15 mm glass coverslips on a 12 well at density of 150.000/cm<sup>2</sup>. The neurons were transfected 4 d.i.v. with pSyn-eGFP using 25  $\mu$ l MATra complex per well (prepared by adding a MATra-A Reagent-DNA complex mixture (2.8  $\mu$ g cDNA; 2.8  $\mu$ l beads) into 175  $\mu$ l neuronal medium without serum). The cells were fixed 6 d.i.v. with 4% PFA and imaged.

**“With MATra we can transfect and modulate the expression levels of exogenous proteins in highly sensitive primary neurons without any toxicity. Once optimized,**

**double and even triple transfections with different DNA ratios are easily achieved”** said Dr. Mika Ruonala, ENI, Göttingen.

(Data kindly provided by Dr. Mika Ruonala, European Neuroscience Institute, Göttingen, Germany; mika.ruonala@medizin.uni-goettingen.de)

## Transient transfection of stable carcinoma cells with GFP plasmid

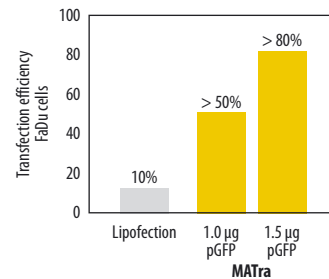
GFP expression in FaDu head and neck cancer cells after transient transfection with pGFP plasmid DNA. FaDu cells ( $5 \times 10^5$  cells per cavity of a 6 well plate) were transfected with 1.0  $\mu$ g (B) or 1.5  $\mu$ g (C) pGFP expression plasmid using MATra-A (1  $\mu$ l/1  $\mu$ g DNA). Control: 1.0  $\mu$ g empty vector, transfected under same conditions (A). GFP fluorescence was detected by flow cytometry after 48 hours.

FaDu cells are typically transfected with standard lipofection reagents with an efficiency of about 10% (1  $\mu$ g GFP in  $5 \times 10^5$  cells in 6 wells).

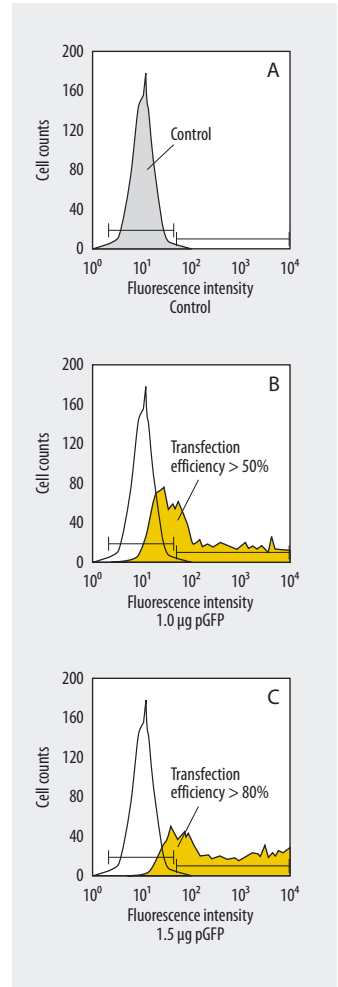
With MATra expression of GFP was detected in 52.7% (1.0  $\mu$ g) and 82.55% (1.5  $\mu$ g) of the cells.

**“With MATra we have been able to increase the transfection efficiency to rates as high as 80% at 48 h following treatment”** stated Olivier Gires from the LMU Munich. **“All cell lines tested showed an increased transfection rate with MATra-A in comparison to lipofection or electroporation protocols.”**

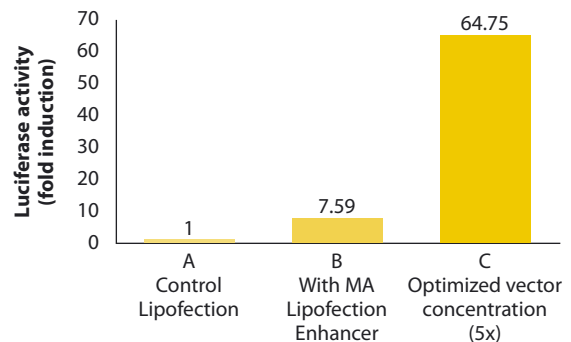
(Data kindly provided by Rauch, Schaffrik, Ahlemann and Gires, LMU Munich and GSF, Munich, Germany)



**With MATra transfection efficiency has been increased 8x compared to lipofection.**



## Magnet Assisted Lipofection of fish bone-derived V5a13 cells



Luciferase activity	Conditions
A 1	3 $\mu$ l of Lipofection Reagent “F6”/500 ng GAL-LUC and 50 ng CMV-GAL
B 7.59	like A, plus 1 $\mu$ l of MA Lipofection Enhancer
C 64.75	like B, but 2500 ng GAL-LUC and 250 ng CMV-GAL

The fish bone-derived V5a13 cells were cultured in D-MEM supplemented with 10% FBS. Magnet Assisted Lipofection was performed in cultures at 60–80% confluence grown in 12 well plates and in absence of FBS. CMV-GAL and a GAL-LUC constructions were co-transfected using MA Lipofection Enhancer combined with Lipofection reagent “F6”. (Alternatively, IBA’s lipofection reagent IBAfect can be used!)

**Especially for cells difficult to transfect, it is important to titrate the optimal DNA concentration to obtain highest transfection efficiencies. In V5a13 fish bone-derived cells, multiplying DNA quantity by 5 resulted in about 8.5-fold increase in transfection efficiency.**

(Data kindly provided by Vincent Laizé, Universidade do Algarve, Faro, Portugal)

## Mammalian cells that have been efficiently transfected using MATra

To acquire these data either MATra-A Reagent has been used, or a combination of MA Lipofection Enhancer with IBAfect\*.

Works for the 5 most popular cell lines!

Adherent cells					
Cell line	Cell type	Organism	MATra-A	MA Lipofection Enhancer with IBAfect*	IBAfect
HEK 293	kidney	human	+	+	+
HeLa	cervix carcinoma	human	+	+	+
CHO	ovarian	hamster	+	+	+
BHK	kidney	hamster	n.d.	+	+
NIH 3T3	fibroblasts	mouse	+	+	+

16HB140	airway epithelium	human	+	n.d.	n.d.
EJ28	bladder cancer	human	+	n.d.	n.d.
HBL-100	breast	human	n.d.	+	+
MCF7	breast adenocarcinoma	human	+	+	+
HCT 116	colon adenocarcinoma	human	n.d.	+	+
SW480	colon adenocarcinoma	human	n.d.	+	+
LoVo	colon adenocarcinoma	human	n.d.	+	+
HCT15	colon adenocarcinoma	human	n.d.	+	+
A431	epidermoid carcinoma	human	n.d.	+	+
HT-1080	fibrosarcoma	human	+	n.d.	n.d.
Hep G2	hepatocellular carcinoma	human	n.d.	+	+
HaCat	keratinocytes	human	n.d.	+	+
293 T	kidney	human	+	+	+
293 T-17	kidney	human	n.d.	+	+
SK-MES-1	lung carcinoma	human	+	n.d.	n.d.
MeWo	melanoma	human	n.d.	+	+
SK-MEL-28	melanoma	human	n.d.	+	+
SHSY-5Y	neuroblastoma	human	n.d.	+	+
A549	Non-small cell lung carcinoma	human	n.d.	+	+
SaOS-2	osteo sarcoma	human	n.d.	+	+
BTK-143	osteo sarcoma	human	n.d.	+	+
181RDB	pancreatic	human	n.d.	+	+
PC-3	prostate carcinoma	human	n.d.	+	+
HSG	salivary gland, submandibular.	human	n.d.	+	+
NCI H-82	small cell lung cancer	human	+	n.d.	n.d.
ECV-304	urinary bladder carcinoma	human	n.d.	+	+

CT-26	colon carcinoma	mouse	+	n.d.	n.d.
F9	embryonal carcinoma	mouse	+	n.d.	n.d.
L929	fibroblast, connective tissue	mouse	+	n.d.	n.d.
MEF	fibroblast	mouse	+	n.d.	n.d.
HT-22	hippocampal neuroblast	mouse	n.d.	+	+
mIC-(d2)	intestine	mouse	n.d.	+	+
B16F10	melanoma	mouse	+	n.d.	n.d.
B16F10.9	melanoma	mouse	+	n.d.	n.d.
NS20Y	neuroblastoma	mouse	n.d.	+	+
SM 10	trophoblast	mouse	n.d.	+	+

PC12	adrenal pheochromocytoma	rat	+	n.d.	n.d.
C6	glioma	rat	n.d.	+	+
H4IIE	hepatoma	rat	n.d.	+	+
L6	skeletal muscle cell	rat	+	n.d.	n.d.

COS-7	kidney	monkey	+	+	+
CV-1	kidney	monkey	n.d.	+	+
COS-1	kidney	monkey	n.d.	+	+
Vero 76	kidney	monkey	n.d.	+	+

Adherent cells					
Cell line	Cell type	Organism	MATra-A	MA Lipofection Enhancer with IBAfect*	IBAfect
PT-11	kidney	bovine	n.d.	+	+
MDCK	kidney	canine	+	n.d.	n.d.
CRFK	kidney	cat	n.d.	+	+
AM-C65C8	kidney	pig	n.d.	+	+
VSa13	bone (chondrocyte-like)	fish	+	n.d.	n.d.
-	fibroblasts	xenopus	+	n.d.	n.d.
EMC	mesothelial cells (epicard)		n.d.	+	+

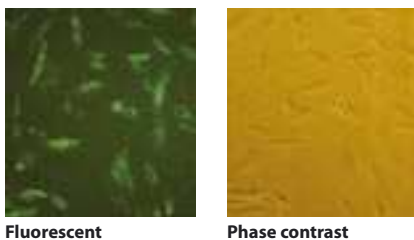
Suspension cells					
Cell line	Cell type	Organism	MATra-A	Enhancer	IBAfect
THP-1	acute myeloid leukemia	human	n.d.	+	+
Jurkat	acute T-cell lymphoma	human	n.d.	+	+
K562	chronic myeloid lymphoma	human	and MATra-S +	n.d.	n.d.
U937	histiocytic lymphoma	human	and MATra-S +	n.d.	n.d.
P815	mastocytoma	mouse	n.d.	+	+

Primary cells					
	Cell type	Organism	MATra-A	Enhancer	IBAfect
	aortic endothelial cells	human	+		n.d.
	dendritic cells	human	and MATra-S	n.d.	n.d.
	epithelial (HUVEC)	human	+	n.d.	n.d.
	fibroblasts	human	n.d.	+	+
	fibroblasts, diploid	human	n.d.	+	+
	gastric gland	human	+	n.d.	n.d.
	glioma	human	+	n.d.	n.d.
	keratinocytes	human	n.d.	+	+
	LNcaP	human	n.d.	+	+
	mammal epithelium	human	n.d.	+	+
	nasal airway epithelium	human	+	n.d.	n.d.
	pancreatic tumor	human	+	n.d.	n.d.
	peripheral blood lymphocytes	human	n.d.	+	+
	stroma cells (endometrium)	human	+	n.d.	n.d.
	T-cells	human	+	n.d.	n.d.
	trophoblastic cells	human	n.d.	+	+
	fibroblasts (MEF)	mouse	n.d.	+	+
	hippocampal neurons	mouse	+	n.d.	n.d.
	neurons	mouse	+	n.d.	n.d.
	peripheral blood lymphocytes	mouse	n.d.	+	+
	T-cells	mouse	+	n.d.	n.d.
	hepatocytes	rat	n.d.	+	+
	neurons (E18.5)	rat	+	n.d.	n.d.
	aortic endothelial cells	bovine	+	n.d.	n.d.
	carotid artery smooth muscle	bovine	+	n.d.	n.d.
	chromaffine cells	bovine	n.d.	+	+
	lens	bovine	+	n.d.	n.d.
	airway epithelium	pig	n.d.	+	+
	chondrocytes	pig	+	n.d.	n.d.
	fibrochondrocytes	pig	+	n.d.	n.d.
	pSM, smooth muscle	pig	n.d.	+	+

\*in some examples given in this table a lipofection reagent other than IBAfect has been used. n.d. = not determined

**For cells that are not on this list we offer specials to evaluate MATra. Get in touch with us!**

### Human endometrial stromal cells transfected with siRNA

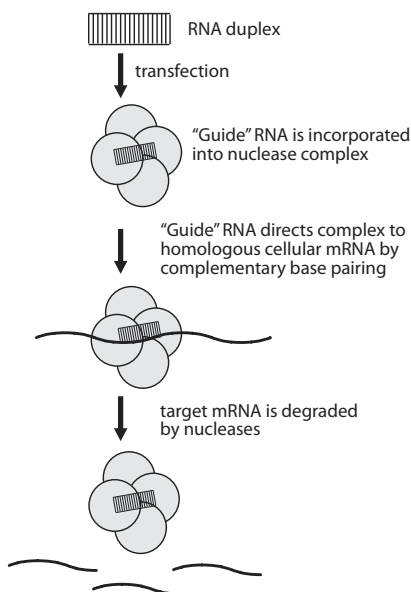


Primary cultures of human endometrial stromal cells were plated in a 96 well plate at a density of 13,000 cells/well. Twenty-four hours later medium was changed. Fluorescein-siRNA was diluted in OptiMEM® 1 Reduced Serum Medium (GIBCO) to 0.9 µg/108 µl. MATra-A reagent (0.45 µl) was added to obtain a ratio of 2:1 (siRNA:MATra-A). After 20 minutes incubation at room temperature, 15 µl of the mixture (corresponding to 125 ng siRNA) were added per well. The culture plate was placed on a 96 Magnet Plate for 15 minutes at 37°C. Cells were incubated for 20 hours at 37°C, medium was changed before microphotographs were taken.

**Virtually all cells had taken up the fluorescent siRNA.**

(Data kindly provided by Dr. Birgit Gellersen, Endokrinologikum Hamburg, Hamburg, Germany)

### siRNA for Gene Silencing Studies



**Attractive pricing! See also [www.rna-tools.com](http://www.rna-tools.com).**

## siRNA for Interference Studies

Small inhibitory RNA oligonucleotides (siRNAs) allow transient gene expression inhibition of genes *in vitro* and *in vivo*.

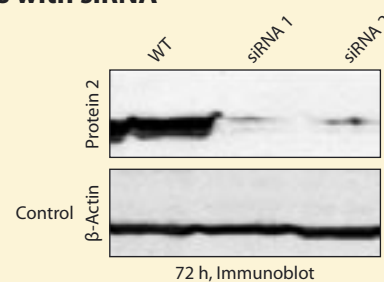
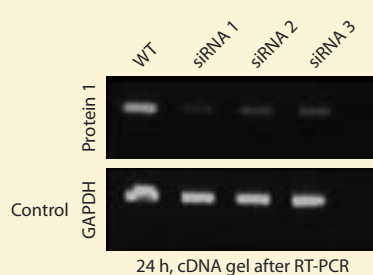
**MATra is an excellent tool to transfect siRNA into different cell lines**, such as carcinoma cell lines.

Being a specialist for RNA synthesis we are also offering siRNA for gene silencing studies.

Short RNA duplexes are offered ready-to-use, i.e. purified, deprotected and annealed. A negative control sense and antisense RNA are included. There are no additional charges for the number of base pairs.

siRNA is also available labeled with fluorescent dyes or biotin.

### Transfection of Carcinoma Cell Lines with siRNA



**Efficient transient transfection of siRNA in head and neck cancer cells.** The cell line ANT-1 was transiently transfected with MATra-A (1 µl/1 µg DNA) in a 6 well format (5 x 10<sup>5</sup> cells/cavity) with siRNA against protein 1 (100 nM). After 24 hours total RNA was isolated and expression of protein 1-specific mRNA determined by RT-PCR (upper lane). siRNA 1-3 are three different oligonucleotide sequences. Control for consistent loading and cDNA quality: expression of ubiquitarily GAPDH mRNA (lower lane).

**Protein 2 expression in head and neck cancer cells GHD-1.** GHD-1 cells (5 x 10<sup>5</sup> cells/cavity of a 6 well plate) were transiently transfected with two different siRNAs against protein 2. Expression of protein 2 was detected with specific antibodies in an immunoblot 72 hours after transfection with MATra-A (1 µl / 1 µg DNA). As control ubiquitarily β-actin was detected as well.

**Treating the carcinoma cells with specific siRNA caused a clear inhibition of protein 1/protein 2 expression which indicates high transfection efficiencies.**

(Data kindly provided by Rauch, Schaffrik, Ahlemann and Gires, LMU Munich and GSF, Munich, Germany)

*"After having tested MATra in a variety of experimental set ups we can summarize the following advantages:*

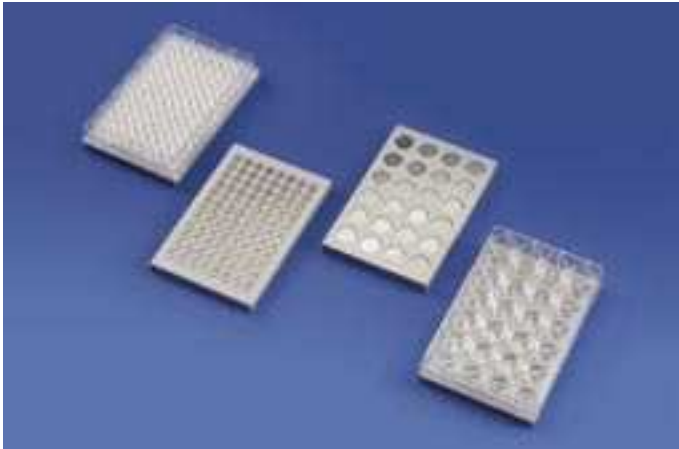
- High transfection efficiency
- Easier to handle
- High reproducibility
- Serum compatibility
- Low sensibility against cell confluence"

Dr. Oliver Gires,  
LMU Munich, Germany

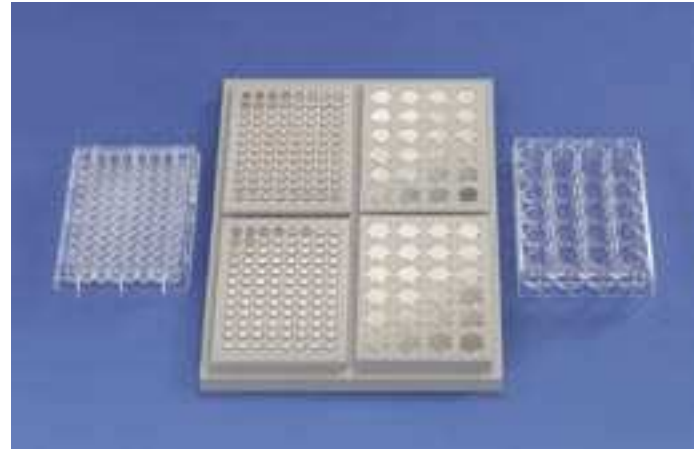
### Order information siRNA

<b>Ready-to-use:</b> RNA duplexes, purified, deprotected and annealed, plus negative control (sense and antisense); <b>unlabeled</b>	
0.2 µmol 20–40 nmol (140–280 µg) dsRNA; 5-10 nmol ssRNA as control cat.no. 5-0515-113	1.0 µmol 50–100 nmol dsRNA; 10–20 nmol ssRNA as control cat.no. 5-0515-114
<b>Ready-to-use:</b> RNA duplexes <b>with fluorescent label or biotin</b> , purified, deprotected and annealed, plus negative control (sense and antisense)	
1.0 µmol 50–100 nmol dsRNA; 10–20 nmol ssRNA as control Cat.no. 5-0516-124	
<b>Ready-to-use: control</b> siRNA (β-Actin; lamin A/C) 5, 10 or 25 nmol, unlabeled	
Cat.no. 5-0515-142/3 or 4 (lamin A/C) Cat.no. 5-0515-152/3 or 4 (β-Actin)	

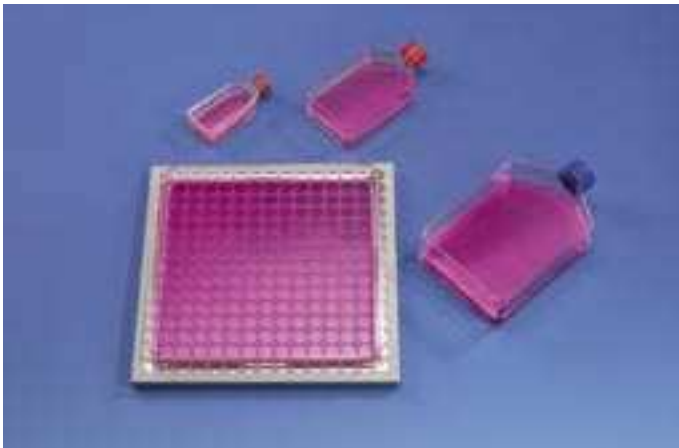
# Magnet Plates and Specifications



96 and 24 Magnet Plates with appropriate culture plates. Please note that the 96 Magnet Plates can also be used with 6 and 12 well plates and T75 flasks.



Set of 4 Magnet Plates on a solid support (96 and 24 Magnet Plates can be combined individually) for multi-user parallel use.



25 x 25 cm Magnet Plate for large scale applications.



Collection of all available Magnet Plates with MATra reagents and different culture plates that can be combined.

## Magnet Plates

- available in 24 or 96 magnet format, as sets of 4 plates of choice in combination or as 25 x 25 cm plate for large scale applications
- can easily be decontaminated with 70% ethanol
- can be used within incubators and robots
- compatible with culture plates from the most common suppliers\*
- several generations of magnet plate development (type of magnet and magnetic field) resulted in a unique plate for which a utility patent application is issued

## MATra Specifications

MATra is applicable at different phases of cell confluence, however in general we recommend 60–80% confluence (in some systems a higher visual confluence may result in higher Magnet Assisted Transfection rates). MATra is non-toxic at recommended amounts in most cell systems. However if higher DNA/MATra or Enhancer amounts are used a medium change is recommended after 1–2 h. In general a DNA/MATra titration curve should be run first.

**The MATra technology is compatible with robots for high-throughput transfections!**

\* If you rely on a particular supplier, please contact us.

# Order Information

## For MATra Applications

Cat. no.	Description
7-2001-020	MATra-A Reagent, for 200 µg nucleic acids
7-2001-100	MATra-A Reagent, for 1000 µg nucleic acids
7-2002-020	MATra-S Immobilizer, for up to 7 Mio. cells
7-2002-100	MATra-S Immobilizer, for up to 35 Mio. cells
7-2003-020	MA Lipofection Enhancer, for up to 200 µg nucleic acids
7-2003-100	MA Lipofection Enhancer, for up to 1000 µg nucleic acids
7-2004-000	96 Magnet Plate , 1 plate
7-2005-050	IBAfect 0.5 ml
7-2005-100	IBAfect 1.0 ml
7-2005-500	IBAfect 5.0 ml
7-2006-000	24 Magnet Plate , 1 plate
7-2007-000	25x25 cm Magnet Plate, 1 plate
7-2008-000	Set of 4 Magnet Plates (4 x 24 Magnet Plates)
7-2009-000	Set of 4 Magnet Plates (4 x 96 Magnet Plates)
7-2010-000	Set of 4 Magnet Plates (2 x 24 / 2 x 96 Magnet Plates)
7-2999-002	MATra Evaluation Set for adherent cells (for cells not tested so far)
7-2999-003	MATra Evaluation Set for suspension cells (for cells not tested so far)

## Assay formats

Formats	MATra volume recommended [µl]	Transfections per vial (200 µl vial)*
96 well plate	0.1	2000
48 well plate	0.3	667
24 well plate	0.6	333
12 well plate	1.2	167
6 well plate	3	67
60 mm dish	6.6	30
100 mm dish	17.2	12
T-75 flask	23.5	9
25x25 cm plate	156	1**

\* using cat. no. 7-2001-020 (200 µl MATra-A)

\*\* 156 µl MATra-A are required for 500 cm<sup>2</sup>; please titrate to optimize for your application.

### Further MATra applications!

MATra can also be applied for Magnet Assisted Transfection of molecules other than nucleic acids. If you are interested please contact us at [info@iba-go.com](mailto:info@iba-go.com).

## Magnet Assisted Transfection (MATra) of primary cultured rat hepatocytes



Hepatocytes prepared from liver were seeded on 3.5 cm diameter dishes ( $3-5 \times 10^5$  cells/dish) and allowed to grow overnight. The cells were transfected with pCMV-LacZ, a CMV enhancer/promoter-driven  $\beta$ -galactosidase plasmid, as described in the standard protocols for MATra. The cells were fixed with 1% glutaraldehyde and stained in 2 mg/ml X-Gal solution.  $\beta$ -galactosidase-expressing blue cells were examined by microscopy.

**With MATra-A a minimum of 5% cells expressed  $\beta$ -galactosidase, which was several fold better than with lipofection.**

(Data kindly provided by Mikio Nishizawa and Tadayoshi Okumura, Dept. Medical Chemistry, Kansai Medical University, Osaka, Japan).

*"For primary cultured rat hepatocytes MATra has been the most efficient transfection method we have tried so far, and it is much more cost-effective than the common lipofection reagents on the market."*

Prof. Dr. Okumura,  
Kansai Medical University, Osaka, Japan



Request further information at  
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and subscribe to our e-newsletter!

**IBA GmbH**  
Rudolf-Wissell-Strasse 28  
37079 Goettingen  
Germany  
Phone +49(0)551 50672-0  
Fax +49(0)551 50672-181  
[info@iba-go.com](mailto:info@iba-go.com)  
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