

Plasmid & *Minicircle* DNA



OUR PRODUCTS

The better way to DNA!

High Quality Grade

Highest purity as a basis of your successful biomanufacturing

Highly purified plasmid DNA starting material – intensively tested, free of enzymes and animal derived process chemicals for

- highly efficient (co-)transfections
- GMP production of viral vectors, e.g. AAV, LV
- GMP production of RNA

You will receive your plasmid DNA

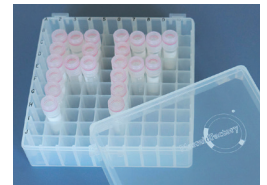
- in certified quality with advanced specifications
- in guaranteed amount
- in aliquots and buffer of your choice
- shipped on dry ice
- with a release certificate and a comprehensive QC Report listing the actual QC results and specifications
- with significantly reduced amounts of endotoxins, bacterial chromosomal DNA and oc-forms

Learn more



Comparison of our different *Quality Grades*

	<i>Research Grade</i>	<i>ccc Grade basic</i>	<i>ccc Grade classic</i>	<i>High Quality Grade</i>
Certified quality incl. QC Report	✓	✓	✓	✓
Guaranteed amount of plasmid DNA	✓	✓	✓	✓
Produced by fermentation	✓	✓	✓	✓
Animal-free production process	–	–	✓	✓
Animal-free cultivation media	✓	✓	✓	✓
Fermentation without antibiotics	✓	✓	✓	✓
Completely enzyme-free	–	–	✓	✓
Documented RCB and pilot cultivation	–	–	–	✓
Storage of glycerol stock for repeat orders included	✓	✓	✓	✓
Verified removal of bacterial endotoxin (LPS assay)	✓	✓	✓	✓
Removal of RNA and proteins	✓	✓	✓	✓
Specific removal of bacterial chromosomal DNA and oc-forms	–	✓	✓	✓
CGE analysis (ccc-supercoiled vs. oc plasmid topologies)	–	✓	✓	✓
Filling included	✓	✓	✓	✓
Adjustment of DNA concentration included	✓	✓	✓	✓
Storage of retain sample included	✓	✓	✓	✓
Additional documentation	–	–	–	✓
Extensive QC	–	–	–	✓
Dedicated lab	–	–	–	✓



ccc Grades

High purity for advanced requirements

Certified quality of supercoiled plasmid DNA for research and pre-clinical applications – optional animal- and enzyme-free for

- highly efficient and reproducible (co-)transfections
- production of viral vectors
- production of RNA, proteins and antibodies
- toxicology studies
- reference standards

You will receive your plasmid DNA

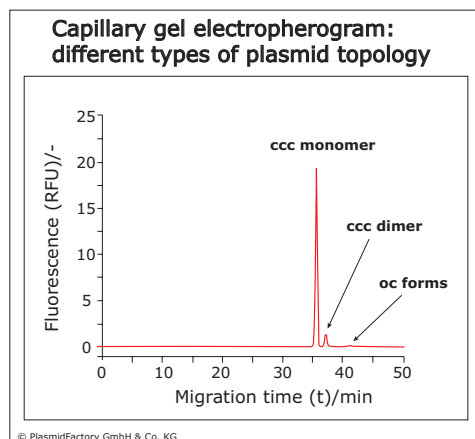
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Storage of retain sample included	✓	✓	✓	✓
Additional documentation	–	–	–	✓
Extensive QC	–	–	–	✓
Dedicated lab	–	–	–	✓



Research Grade

The superior alternative to kit preparations

Certified quality for research applications

- transient gene transfer
- optimization of (co-)transfections
- reporter gene expression vectors
- production of viral vectors
- production of RNA, proteins and antibodies

You will receive your plasmid DNA

- in certified quality
- in guaranteed amount
- in aliquots and buffer of your choice
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- with a release certificate and QC Report listing the actual QC results and specifications

Learn more



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Extensive QC	–	–	–	✓
Dedicated lab	–	–	–	✓



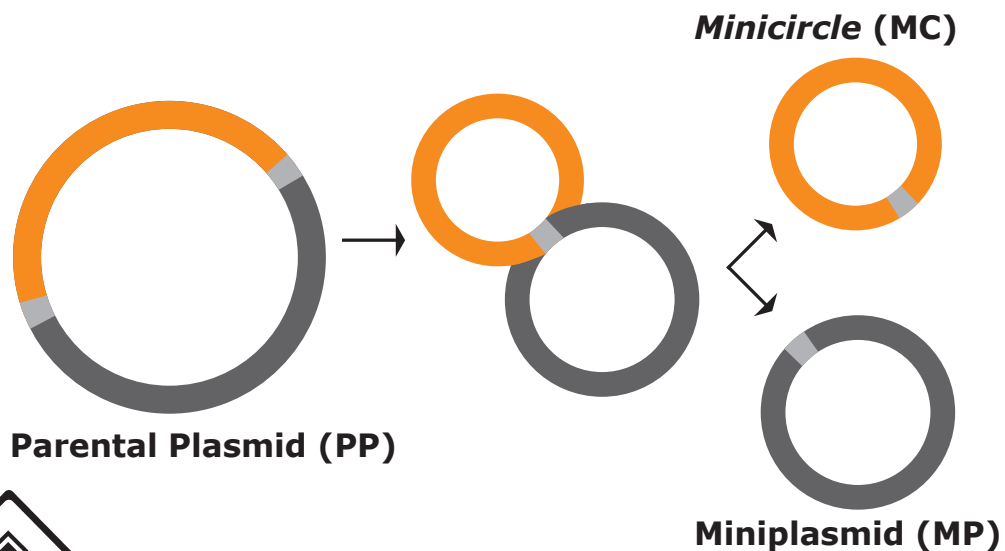
Customized *Minicircle* DNA

***Minicircle* - minimized DNA
for maximized success**

Minicircle features

- no bacterial backbone sequences (e.g. ori, antibiotic resistance marker)
- supercoiled monomer of minimal size
- highly purified
- reduced CpG content
- improved safety
- minimized side effects
- excellent transfection efficiency

The PlasmidFactory *Minicircle* System – unique Superiority!



Learn more

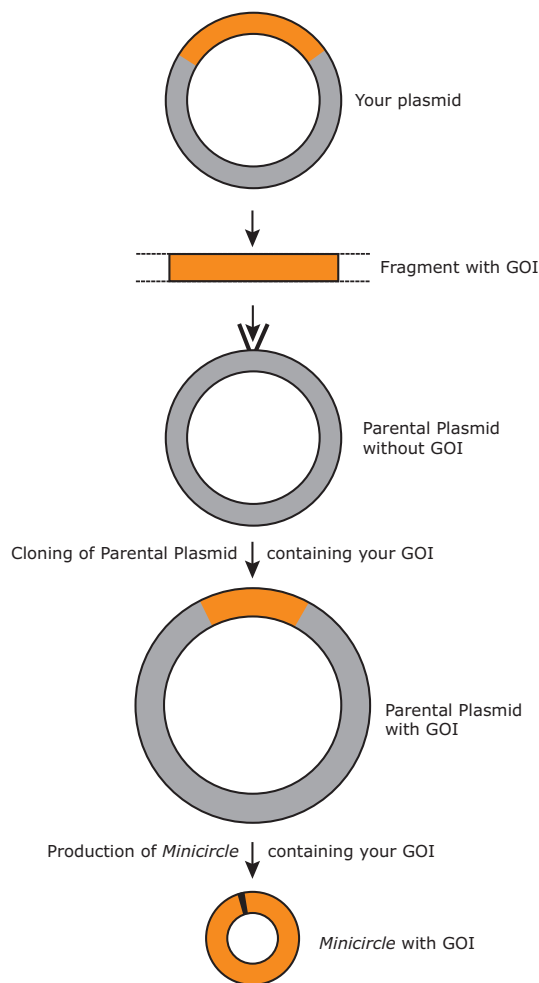


Proprietary and patented *minicircle* DNA technology by PlasmidFactory

Production procedure

Your plasmid containing the gene of interest (GOI) serves as starting material. Either by cut and paste, gene synthesis or amplification by PCR, this will be inserted into the so-called parental plasmid. Intramolecular recombination of this parental plasmid leads to the *minicircle* DNA molecule containing almost only the GOI.

Your Gene of Interest (GOI)



Literature

S. Prommersberger, R. Monjezi, R. Shankar, M. Schmeer, M. Hudecek, Z. Ivics et al. (2022), Minicircles for CAR T Cell Production by Sleeping Beauty Transposition: A Technological Overview, Page 25-40

M. Holstein, C. Mesa-Nuñez, C. Miskey, E. Almarza, V. Poletti, M. Schmeer et al. (2018), Efficient Non-viral Gene Delivery into Human Hematopoietic Stem Cells by Minicircle Sleeping Beauty Transposon Vectors, *Molecular Therapy*, 26(4), 1137-1153

R. Shankar, M. Schmeer and **M. Schleef** (2017), Minicircles: next-generation gene vectors, *Cell Gene Therapy Insights*, 3(2), 285-300.

T. Buchholz, M. Schmeer and **M. Schleef** (2017), Size Matters, *European Biopharmaceutical Review*, October, 68-70

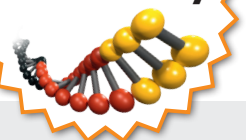
R. Monjezi, C. Miskey, T. Gogishvili, M. Schleef, M. Schmeer, H. Einsele, Z. Ivics and **M. Hudecek** (2016), Enhanced CAR T-cell engineering using non-viral Sleeping Beauty transposition from minicircle vectors, *Leukemia*, 1-9

M. Schnödt, M. Schmeer, B. Kracher, C. Krüsemann, L. E. Espinosa, A. Grünert, T. Fuchsluger, A. Rischmüller, M. Schleef and **H. Büning** (2016), DNA Minicircle Technology Improves Purity of Adeno-associated Viral Vector Preparations, *Molecular Therapy—Nucleic Acids*, 5, e355

M. Schleef (ed.) (2013), Minicircle and Miniplasmid DNA Vectors, *The Future of Non-Viral and Viral Gene Transfer*, Wiley-VCH Weinheim, ISBN 978-3-527-32456-9

M. Schleef (2013), Non Viral DNA Vectors, In: D. Scherman (ed.), *Advanced Textbook on Gene Transfer, Gene Therapy and Genetic Pharmacology – Principles, Delivery and Pharmacology and Biomedical Application of Nucleotide-Based Therapies*, Imperial College Press London, 183-205

**Made
in Germany**



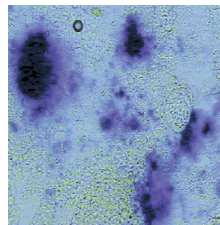
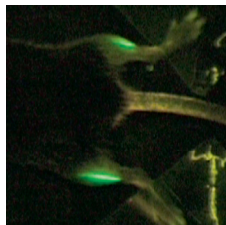
In Stock Service

Reporter Gene Plasmids and *Minicircles*

Plasmids and *minicircles* to go – immediate delivery off the shelf and ready to use

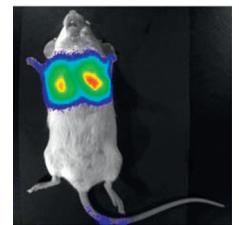
Reporter gene plasmids with *luc*, *GFP*, *lacZ*

GFP
expression in skeletal mouse muscle^[2]



lacZ
expression in tumor tissue (mouse)^[1]

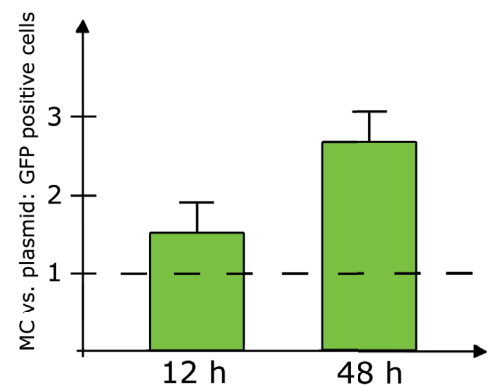
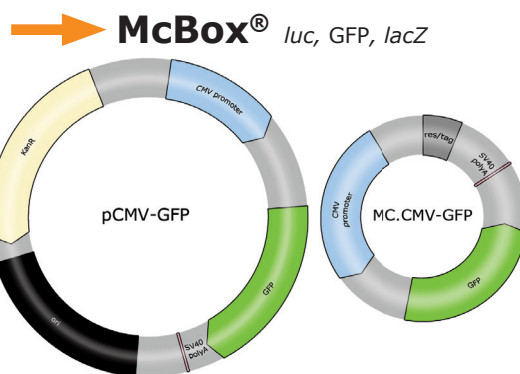
luc
expression in mouse lung (electronically modified for evaluation)^[3]



- [1] Walther and Stein, Max-Delbrück-Center for Molecular Medicine, Berlin
[2] Trollet, Bigey and Scherman, Chemical and Genetic Pharmacology, Université René Descartes, Paris
Ref. [1] and [2] in M. Schleef (ed.), DNA Pharmaceuticals, Wiley-VCH, 2005
[3] Rudolph, Maucksch and Aneja, Kinderklinik and Polyklinik, Dr. v. Haunersches Kinderspital, LMU München

Reporter gene *minicircles*

Compare *minicircle* DNA and the corresponding plasmid for optimized transfection



Our service includes

- **reproducible quality** of the DNA by our standardized manufacturing technology
- incl. **verified LPS-endotoxin removal**
- **fermentation without any animal derived component**
- exactly defined quality and a **homogeneous product** supported by our proprietary capillary gel electrophoresis (CGE) analysis technology for the quantification of different plasmid and *minicircle* topologies
- **complete characterization** of the product by LPS assay, BCA assay, UV spectroscopy, restriction analysis, detection of RNA and bacterial chromosomal DNA by agarose gel electrophoresis (AGE)

Learn more



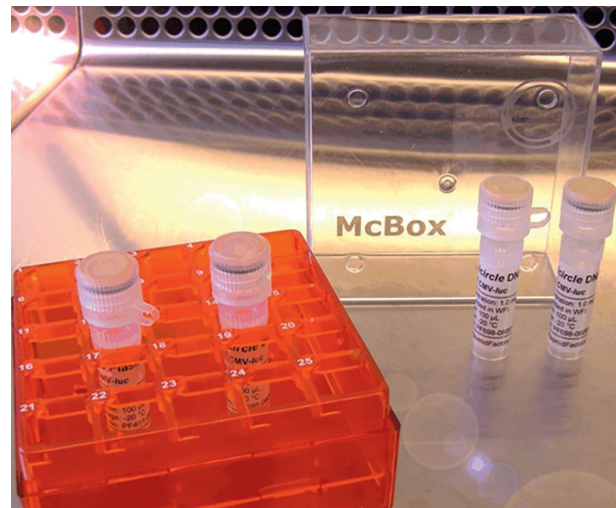
Reporter gene and control plasmid features

Available plasmid	Promoter/Reporter gene	Item no.	Plasmid size	Further specific features
pUC21*	–	PF0450	3266 bp	Control plasmid, Amp resistance
pUK21*	–	PF0451	3137 bp	Control plasmid, Kan resistance
pCMV	CMV/–	PF0464	3546 bp	Control plasmid, Amp resistance
pCMV- <i>luc</i>	CMV/ <i>firefly-luciferase</i>	PF0461	6233 bp	Amp resistance
pCMV- <i>lacZ</i>	CMV/ β - <i>galactosidase</i>	PF0462	7164 bp	Amp resistance
pCMV-GFP	CMV/ <i>green fluorescent protein</i>	PF0463	3487 bp	Kan resistance

*Reference: Vieira, J. and Messing, J. (1991), New pUC-derived cloning vectors with different selectable markers and DNA-replication origins, Gene 100, 189-194

McBox® features

McBox®<i>luc</i> (Item no. PFBox101)
MC.CMV- <i>luc</i> (<i>minicircle</i> , 100µg) pCMV- <i>luc</i> (plasmid, 100µg) WFI (water for injection, 500µL)
McBox®GFP (Item no. PFBox102)
MC.CMV-GFP (<i>minicircle</i> , 100µg) pCMV-GFP (plasmid, 100µg) WFI (water for injection, 500µL)
McBox®<i>lacZ</i> (Item no. PFBox103)
MC.CMV- <i>lacZ</i> (<i>minicircle</i> , 100µg) pCMV- <i>lacZ</i> (plasmid, 100µg) WFI (water for injection, 500µL)



Further *In Stock* products

- AAV Helper & Packaging plasmids
- pEPito and pEPI plasmids containing S/MAR elements



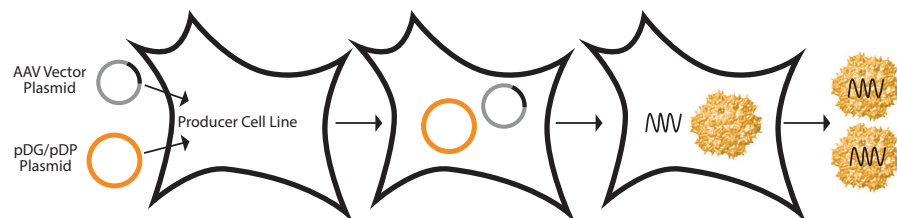
In Stock Service

AAV 2-Plasmid-System

Plasmids and *minicircles* to go – immediate delivery off the shelf and ready to use

- Helper and Packaging functions located on only one plasmid
- reduces optimization work to obtain high efficacy in producing your viral vectors
- various Helper & Packaging plasmids for several serotypes
- reproducible quality of the plasmid DNA by our standardized manufacturing technology
- incl. verified LPS-endotoxin removal
- complete characterization of the product by LPS assay, BCA assay, UV spectroscopy, restriction analysis, detection of RNA and bacterial chromosomal DNA by agarose gel electrophoresis

New now!
pDP9



Learn more



AAV Helper & Packaging plasmid features

Plasmid	Serotype	Plasmid size	Item no.	RFP
pDP1rs	<i>rep2/cap1</i>	23.7 kb	PF0401	✓
pDP2rs	<i>rep2/cap2</i>	23.7 kb	PF0402	✓
pDP3rs	<i>rep2/cap3</i>	23.7 kb	PF0403	✓
pDP4rs	<i>rep4/cap4</i>	23.7 kb	PF0404	✓
pDP5rs	<i>rep2/cap5</i>	23.7 kb	PF0405	✓
pDP6rs	<i>rep2/cap6</i>	23.7 kb	PF0406	✓
pDP1	<i>rep2/cap1</i>	21.9 kb	PF0431	–
pDP2 = pDG	<i>rep2/cap2</i>	21.9 kb	PF0421	–
pDP3	<i>rep2/cap3</i>	21.9 kb	PF0433	–
pDP4	<i>rep4/cap4</i>	21.2 kb	PF0434	–
pDP5	<i>rep2/cap5</i>	21.9 kb	PF0435	–
pDP6	<i>rep2/cap6</i>	21.9 kb	PF0436	–
pDP8.ape	<i>rep2/cap8</i>	22.0 kb	PF0478	–
pDP9	<i>rep2/cap9</i>	21.8 kb	PF0439	–

Our pDG/pDP plasmids are manufactured under **worldwide exclusive licence** of the German Cancer Research Centre (DKFZ), Heidelberg.

NEW

AAV vector plasmid/*minicircle*

Vector plasmid	Features	Size	Item no.
pAAV-ssGFP	AAV-ITRs (CMV, GFP, selection marker), bacterial backbone	7.9 kb	PF1451
MC.AAV-ssGFP	AAV-ITRs (CMV, GFP), no bacterial backbone	4.5 kb	MC1472

Additional service

- Custom manufacturing of your individual ITR-containing vector plasmids or *minicircles*

Further *In Stock* products

- Reporter gene plasmids and *minicircles* (McBox®)
- pEPito and pEPI plasmids containing S/MAR elements



ITRESCUE® technology

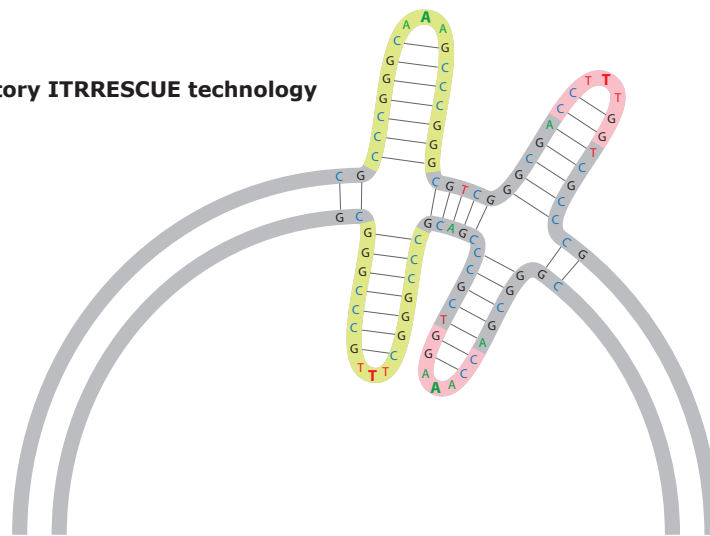
Keeping ITRs intact

We make use of PlasmidFactory's proprietary ITRESCUE® technology to amplify plasmid DNA containing sensitive ITR sequences

ITRESCUE® features

- maintaining intact ITRs in AAV vector plasmids
- starting material for efficient AAV production
- homogenous product

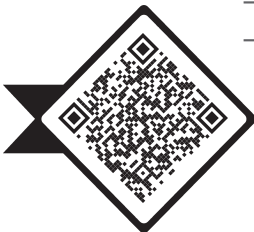
The PlasmidFactory ITRESCUE technology



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C G C C C G G G C A A G C C C G G G C G T C G G G C G A C C T T T G G T C G C C C G
G C G G G C C C G T T T C G G G C C C G C A G C C C G C T G G A A C C A C G C C C C
  
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Learn more



POLYARESCUE® technology

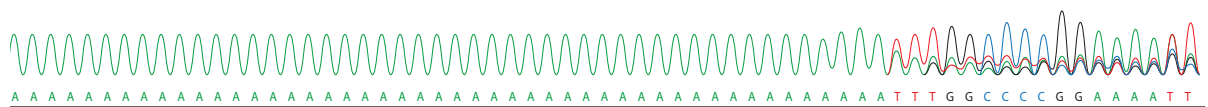
Keeping polyAs intact

We make use of PlasmidFactory's proprietary POLYARESCUE® technology to amplify plasmid DNA containing long polyA stretches

POLYARESCUE® features

- maintaining long polyA stretches in plasmids
- DNA template for efficient mRNA production
- homogenous product

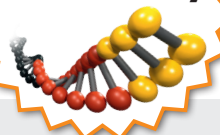
The PlasmidFactory POLYARESCUE technology



Learn more



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