FIG 1

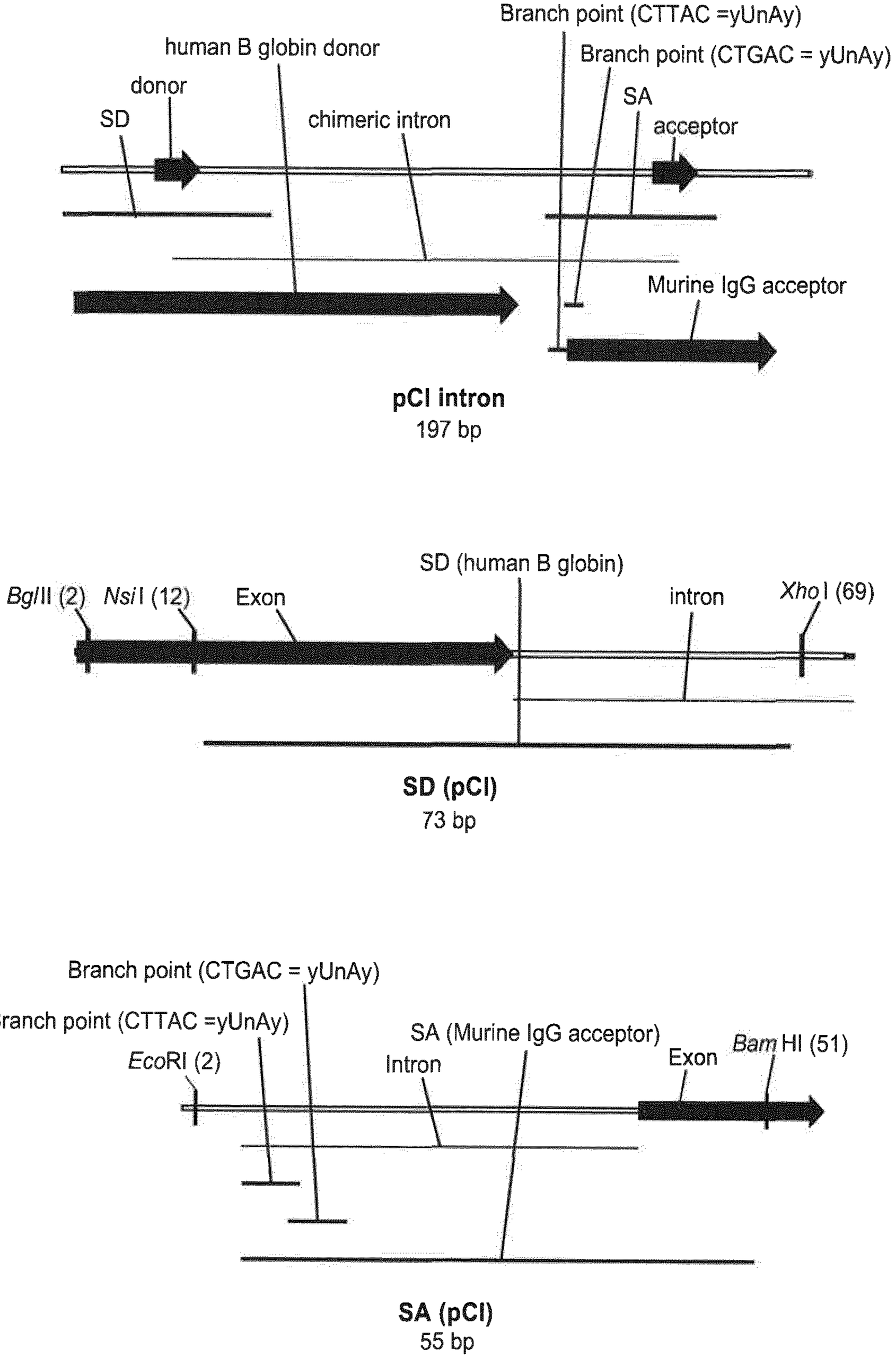
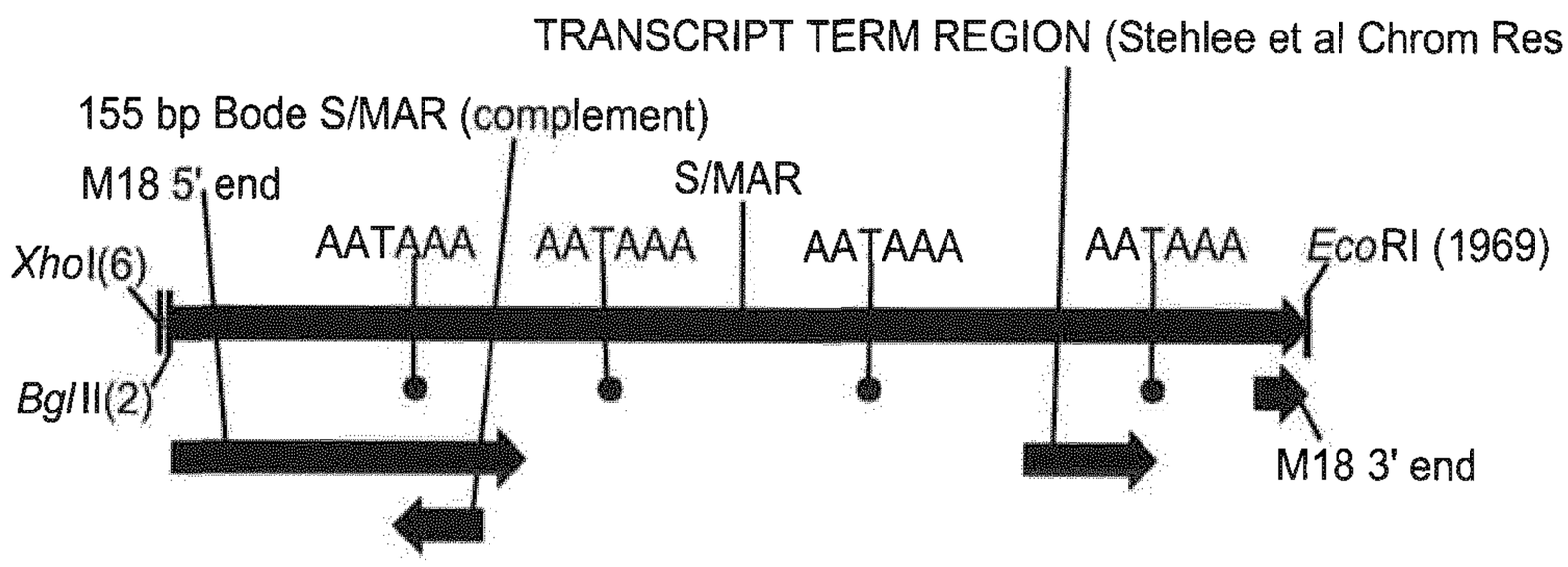
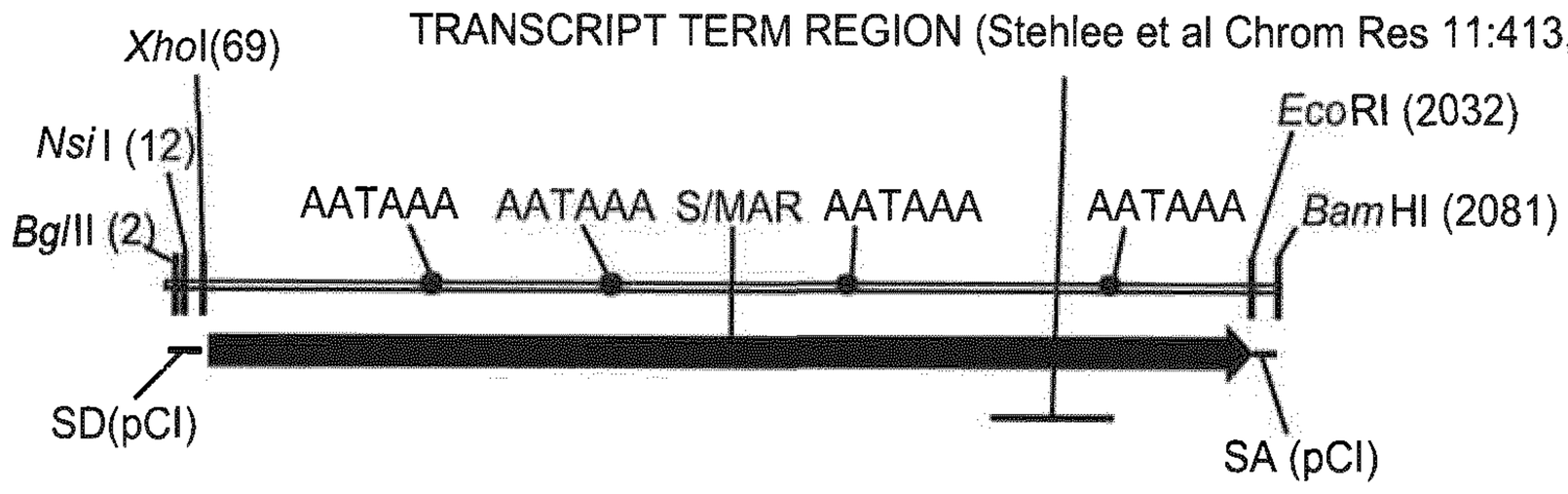

Branch point (CTTAC =yUnAy)
human B globin donor
Branch point (CTGAC = yUnAy)
donor
SA
SD
chimeric intron
acceptor
Murine IgG acceptor
pCI intron
197 bp
SD (human B globin)
BglII (2)
NsiI (12)
Exon
intron
XhoI (69)
SD (pCI)
73 bp
Branch point (CTGAC = yUnAy)
Branch point (CTTAC =yUnAy)
SA (Murine IgG acceptor)
EcoRI (2)
Intron
Exon
BamHI (51)
SA (pCI)
55 bp

FIG 2



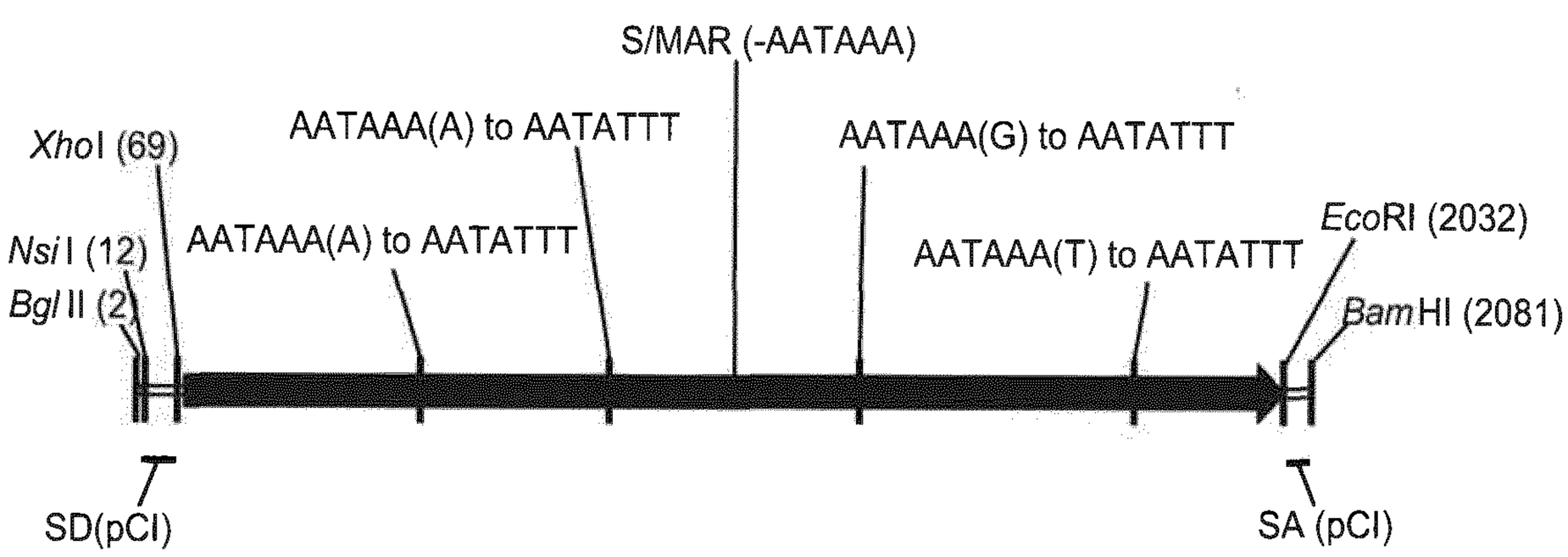
XhoI-S/MAR human IFN B-EcoRI

1973 bp



SD-hIFN B SMAR SA

2085 bp



SD SMAR (-AATAAA) SA

2085 bp

FIG 3

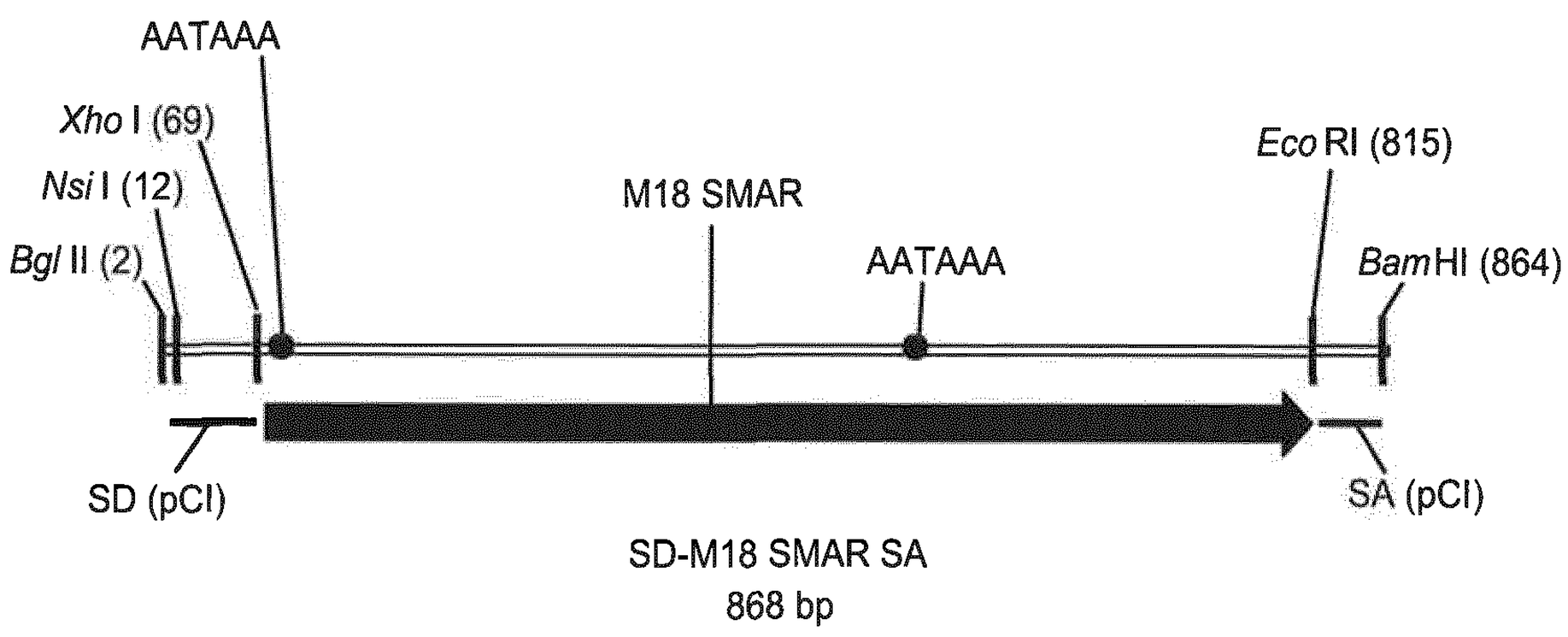
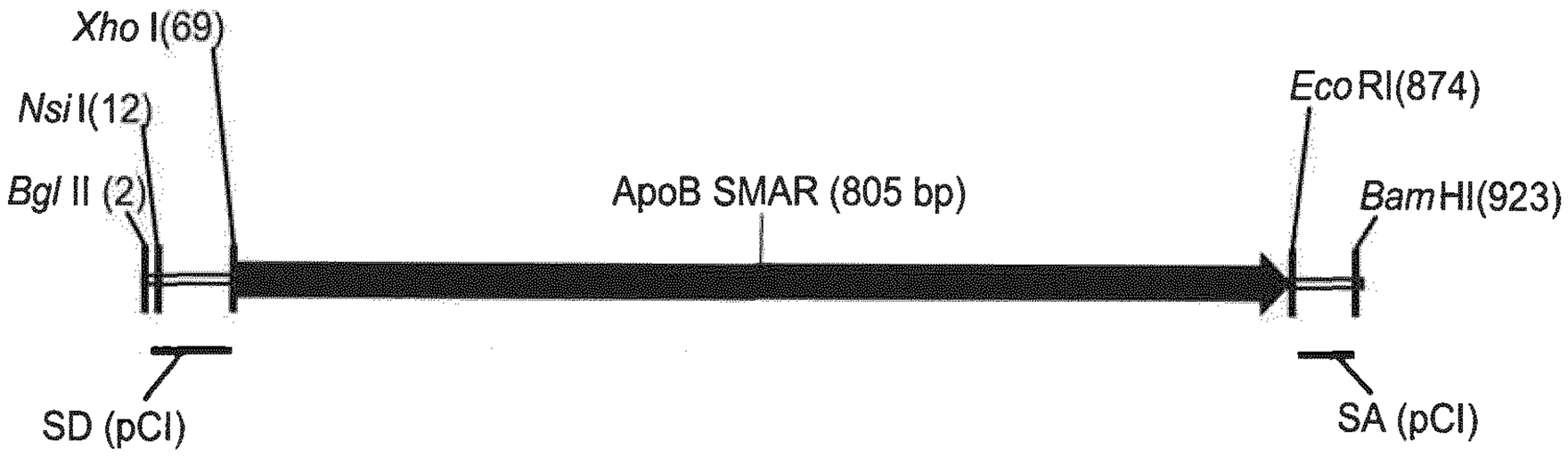
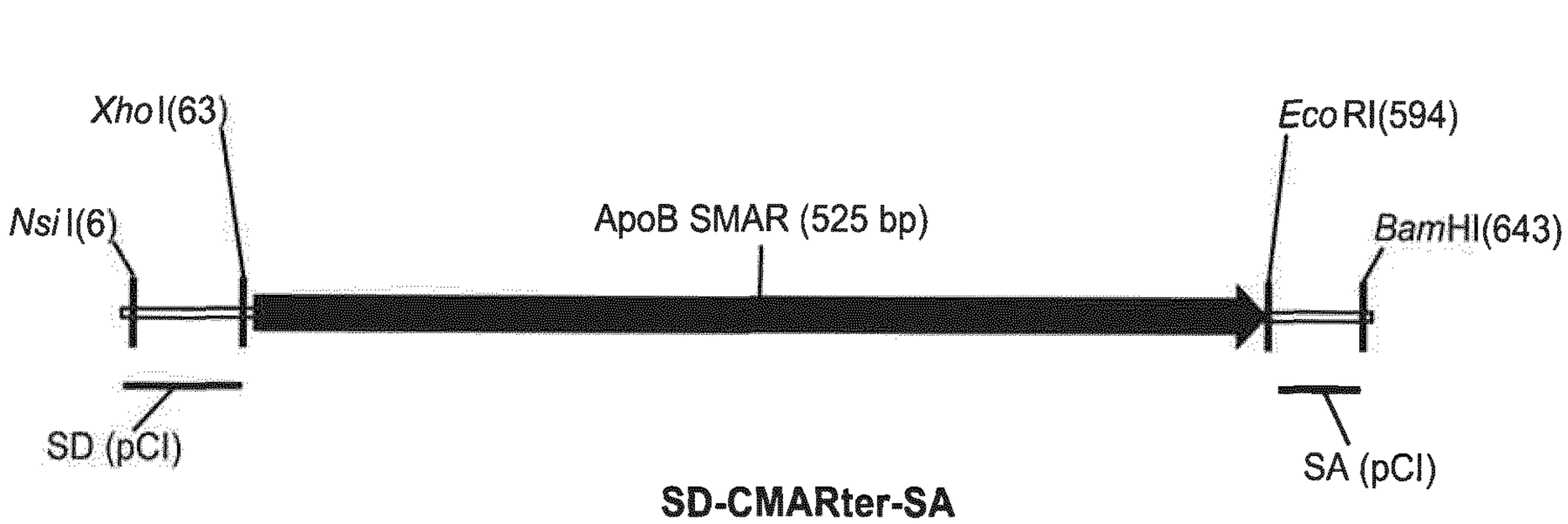

AATAAA
Xho I (69)
Nsi I (12)
Bgl II (2)
M18 SMAR
AATAAA
Eco RI (815)
Bam HI (864)
SD (pCI)
SA (pCI)
SD-M18 SMAR SA
868 bp

FIG 4



SD-SMARter-SA
927 bp



SD-CMARter-SA
647 bp

FIG 5

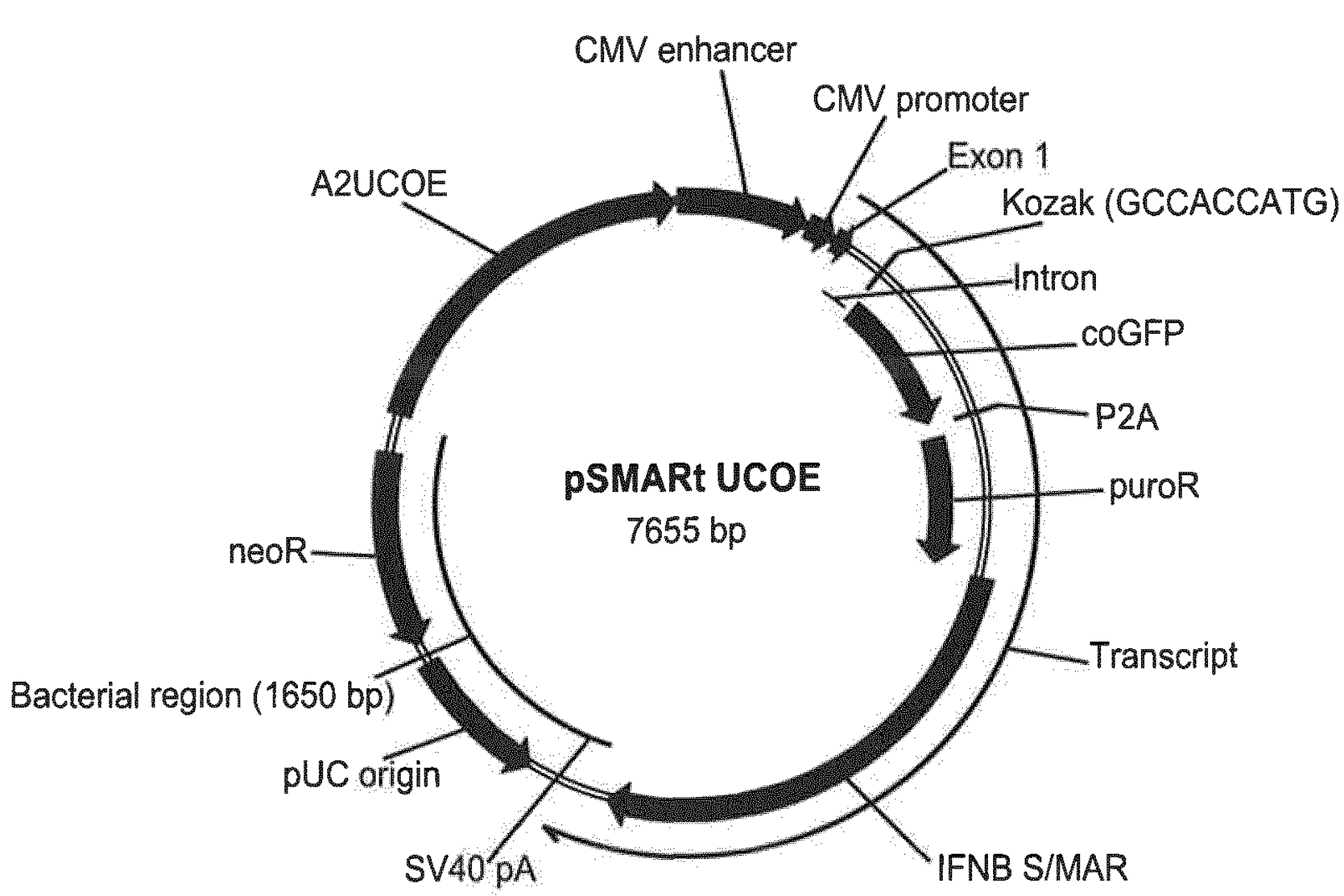

CMV enhancer
CMV promoter
Exon 1
Kozak (GCCACCATG)
Intron
coGFP
P2A
puroR
Transcript
IFNB S/MAR
SV40 pA
pUC origin
Bacterial region (1650 bp)
neoR
A2UCOE
pSMARt UCOE
7655 bp

FIG 6

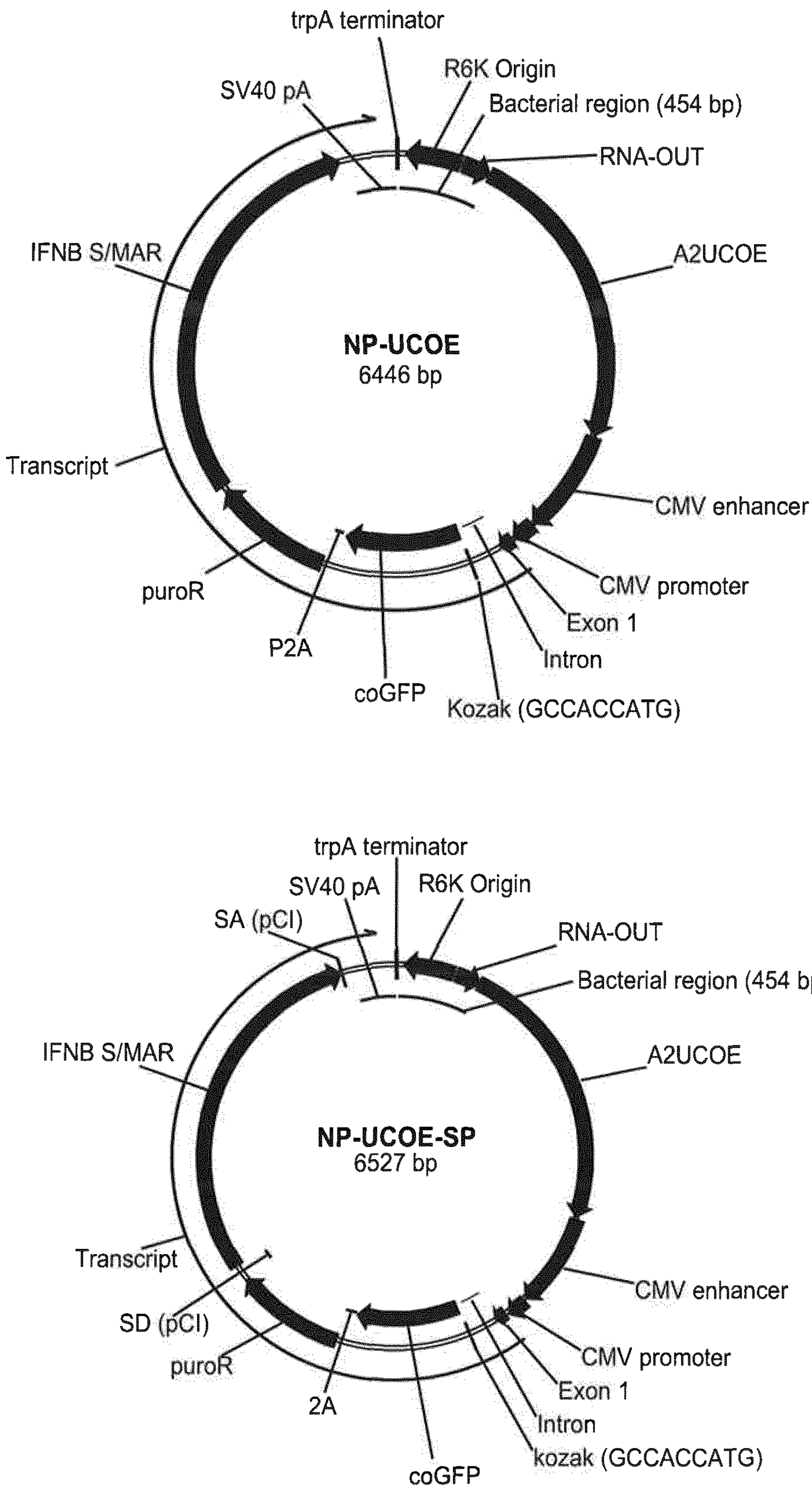
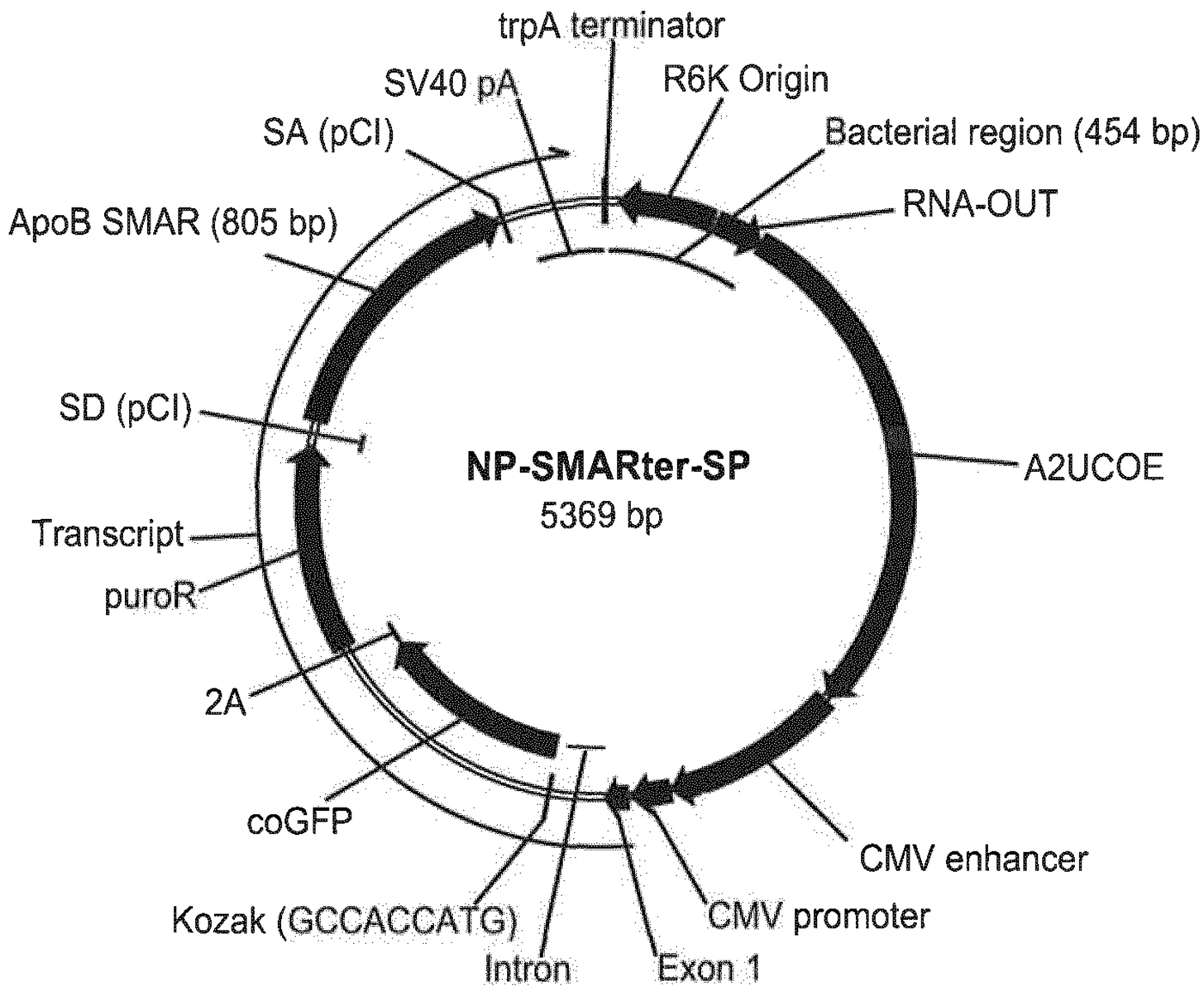

trpA terminator
R6K Origin
Bacterial region (454 bp)
RNA-OUT
A2UCOE
CMV enhancer
CMV promoter
Exon 1
Intron
Kozak (GCCACCATG)
coGFP
P2A
puroR
Transcript
IFNB S/MAR
SV40 pA
NP-UCOE
6446 bp
trpA terminator
R6K Origin
SV40 pA
SA (pCI)
RNA-OUT
Bacterial region (454 bp)
A2UCOE
IFNB S/MAR
NP-UCOE-SP
6527 bp
CMV enhancer
CMV promoter
Exon 1
Intron
kozak (GCCACCATG)
coGFP
2A
puroR
SD (pCI)
Transcript

FIG 7


trpA terminator
SV40 pA
R6K Origin
SA (pCI)
Bacterial region (454 bp)
ApoB SMAR (805 bp)
RNA-OUT
SD (pCI)
A2UCOE
NP-SMARter-SP
5369 bp
Transcript
puroR
2A
coGFP
CMV enhancer
Kozak (GCCACCATG)
CMV promoter
Intron
Exon 1

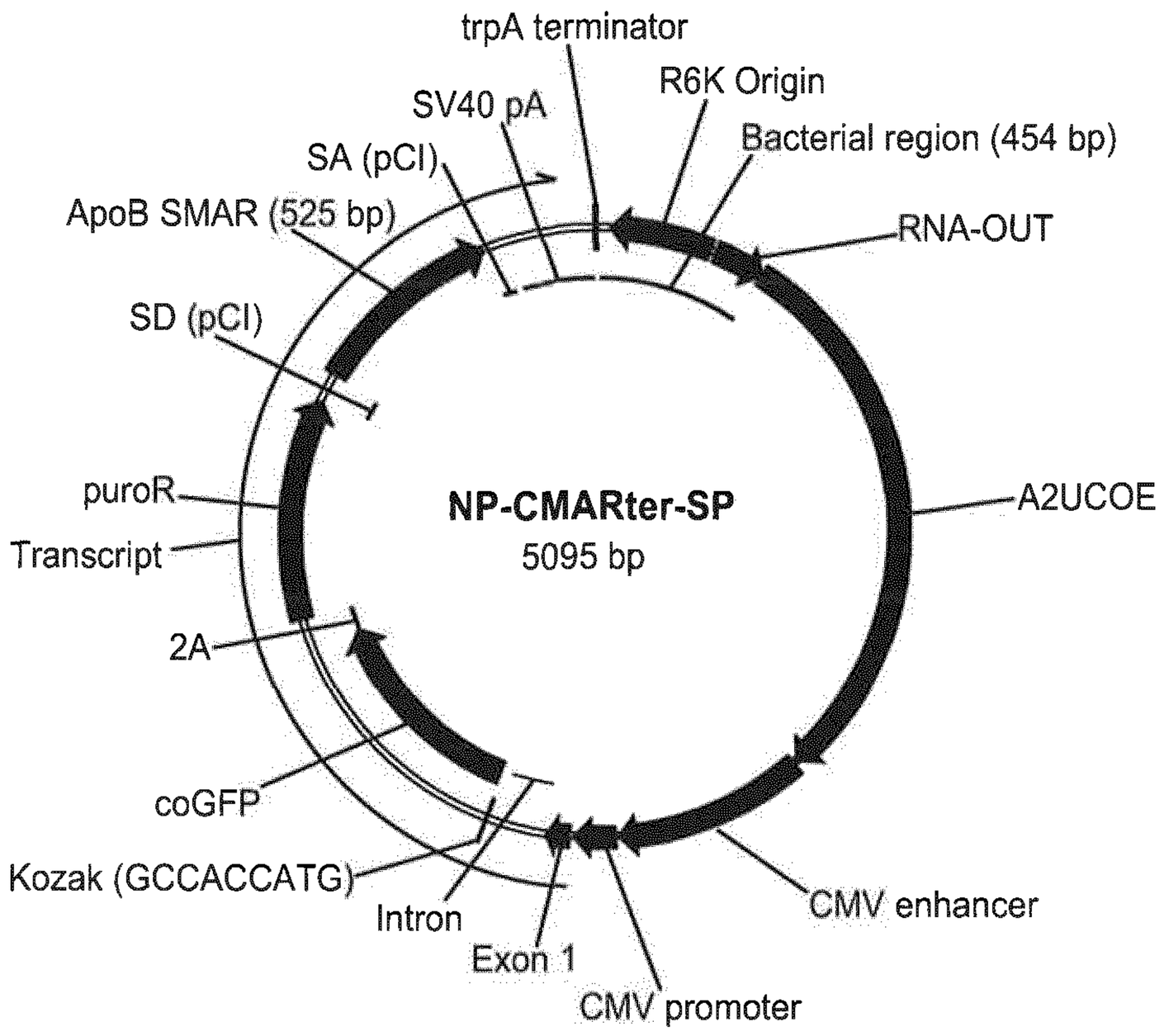

trpA terminator
R6K Origin
SV40 pA
Bacterial region (454 bp)
SA (pCI)
ApoB SMAR (525 bp)
RNA-OUT
SD (pCI)
A2UCOE
puroR
NP-CMARter-SP
5095 bp
Transcript
2A
coGFP
Kozak (GCCACCATG)
CMV enhancer
Intron
Exon 1
CMV promoter

FIG 8

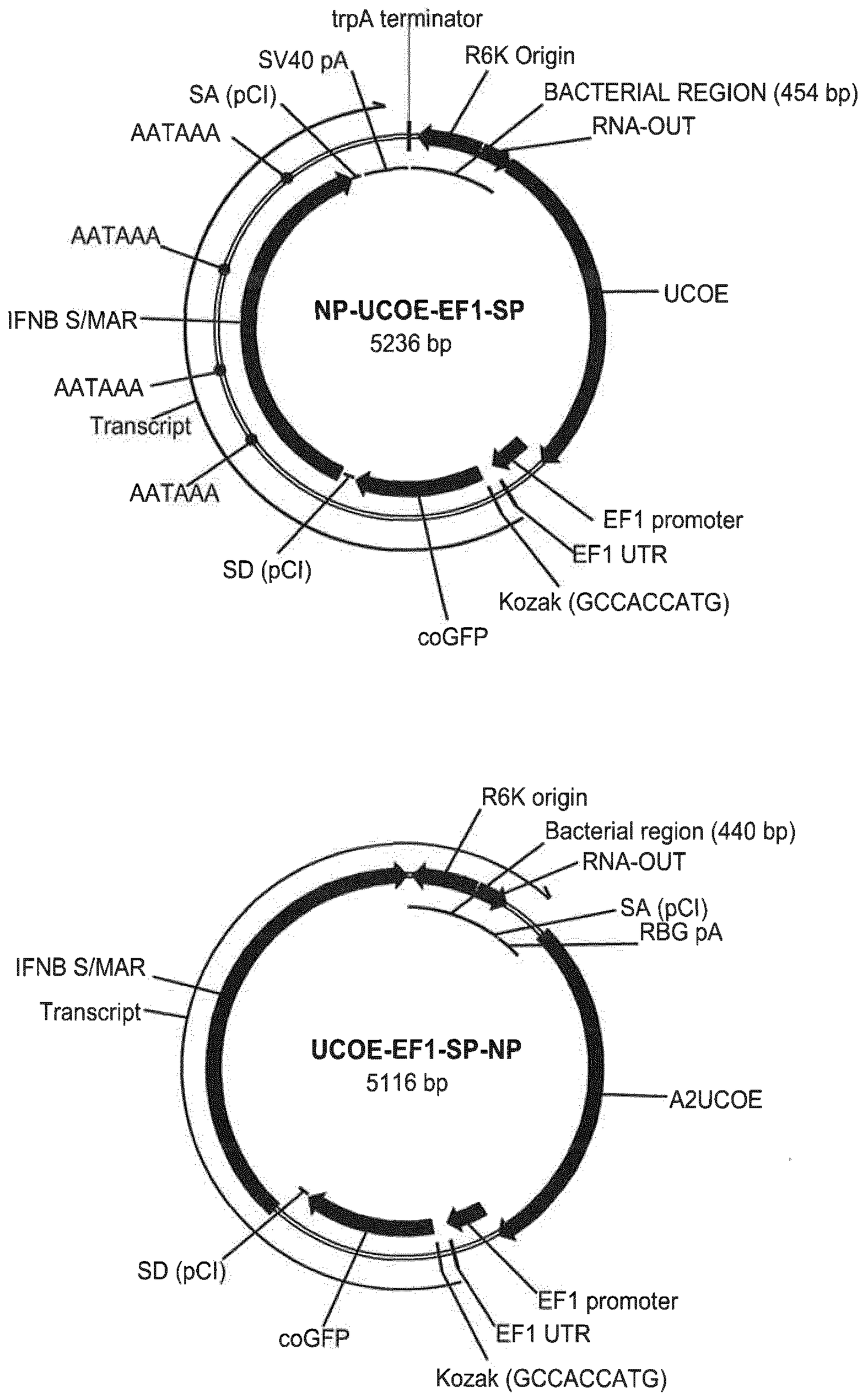

trpA terminator
SV40 pA
R6K Origin
SA (pCI)
BACTERIAL REGION (454 bp)
AATAAA
RNA-OUT
AATAAA
UCOE
NP-UCOE-EF1-SP
5236 bp
IFNB S/MAR
AATAAA
Transcript
AATAAA
EF1 promoter
EF1 UTR
SD (pCI)
Kozak (GCCACCATG)
coGFP
R6K origin
Bacterial region (440 bp)
RNA-OUT
SA (pCI)
RBG pA
IFNB S/MAR
Transcript
UCOE-EF1-SP-NP
5116 bp
A2UCOE
SD (pCI)
EF1 promoter
coGFP
EF1 UTR
Kozak (GCCACCATG)

FIG 9

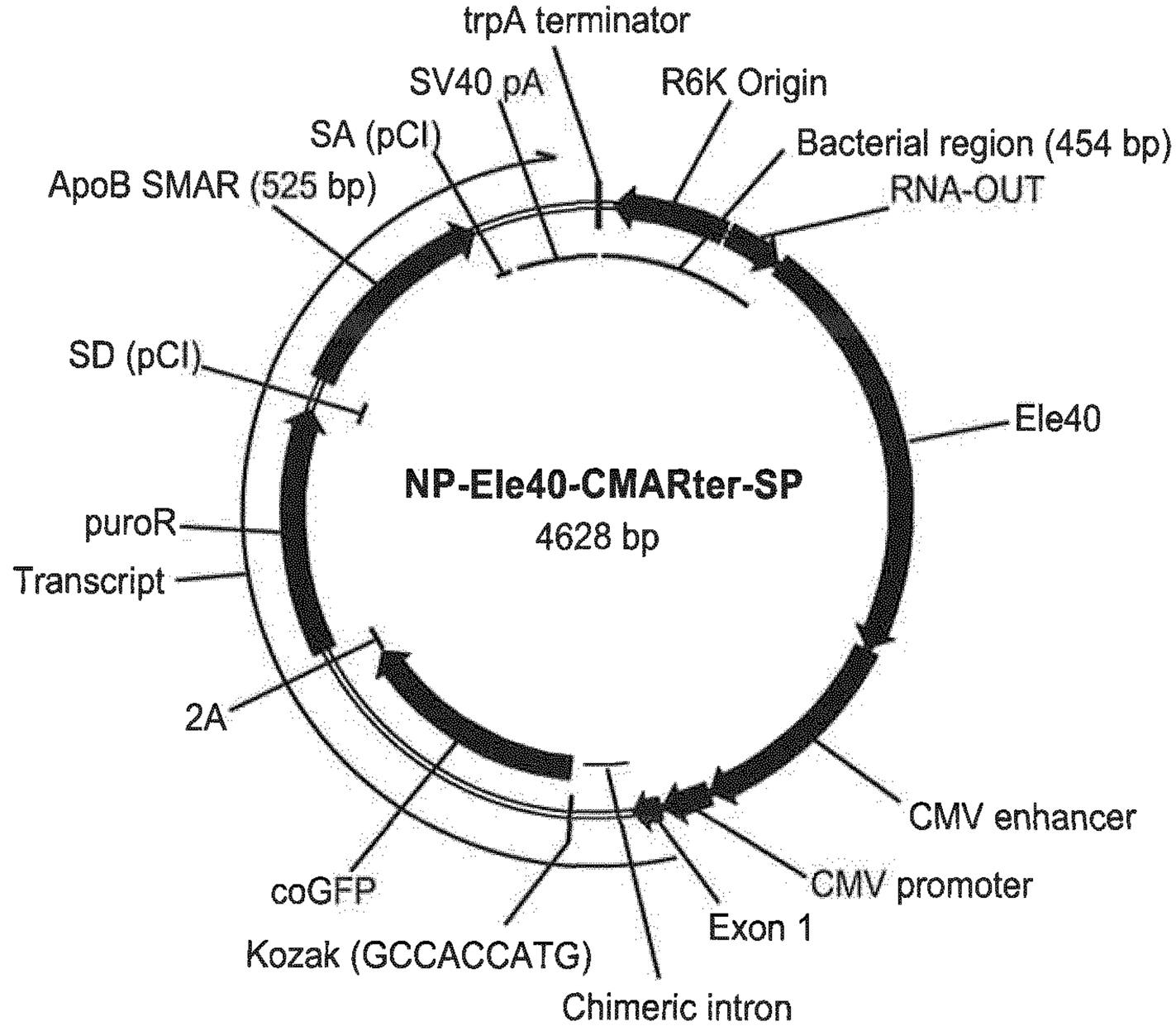
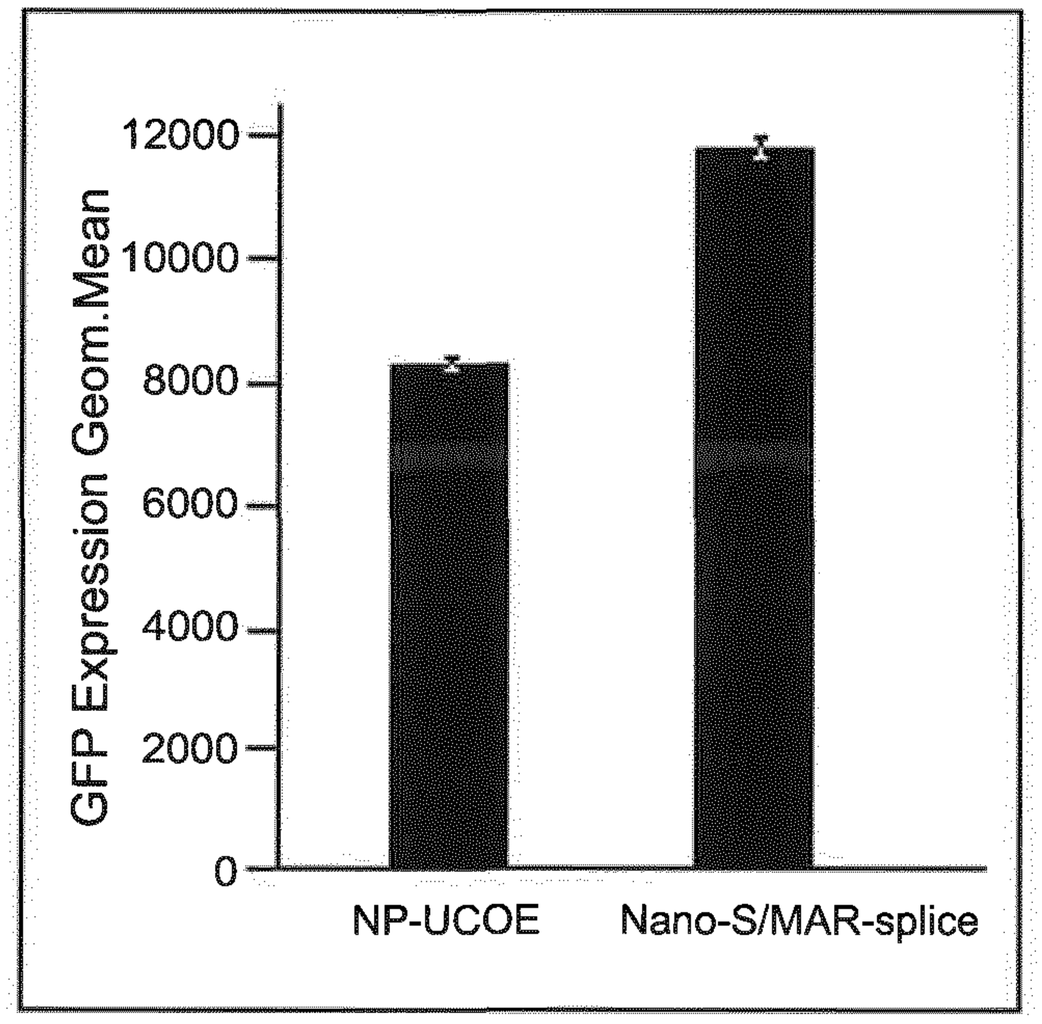

trpA terminator
SV40 pA
R6K Origin
SA (pCI)
Bacterial region (454 bp)
ApoB SMAR (525 bp)
RNA-OUT
SD (pCI)
Ele40
NP-Ele40-CMARter-SP
4628 bp
puroR
Transcript
2A
CMV enhancer
CMV promoter
coGFP
Exon 1
Kozak (GCCACCATG)
Chimeric intron

FIG 10


GFP Expression Geom.Mean
12000
10000
8000
6000
4000
2000
0
NP-UCOE
Nano-S/MAR-splice

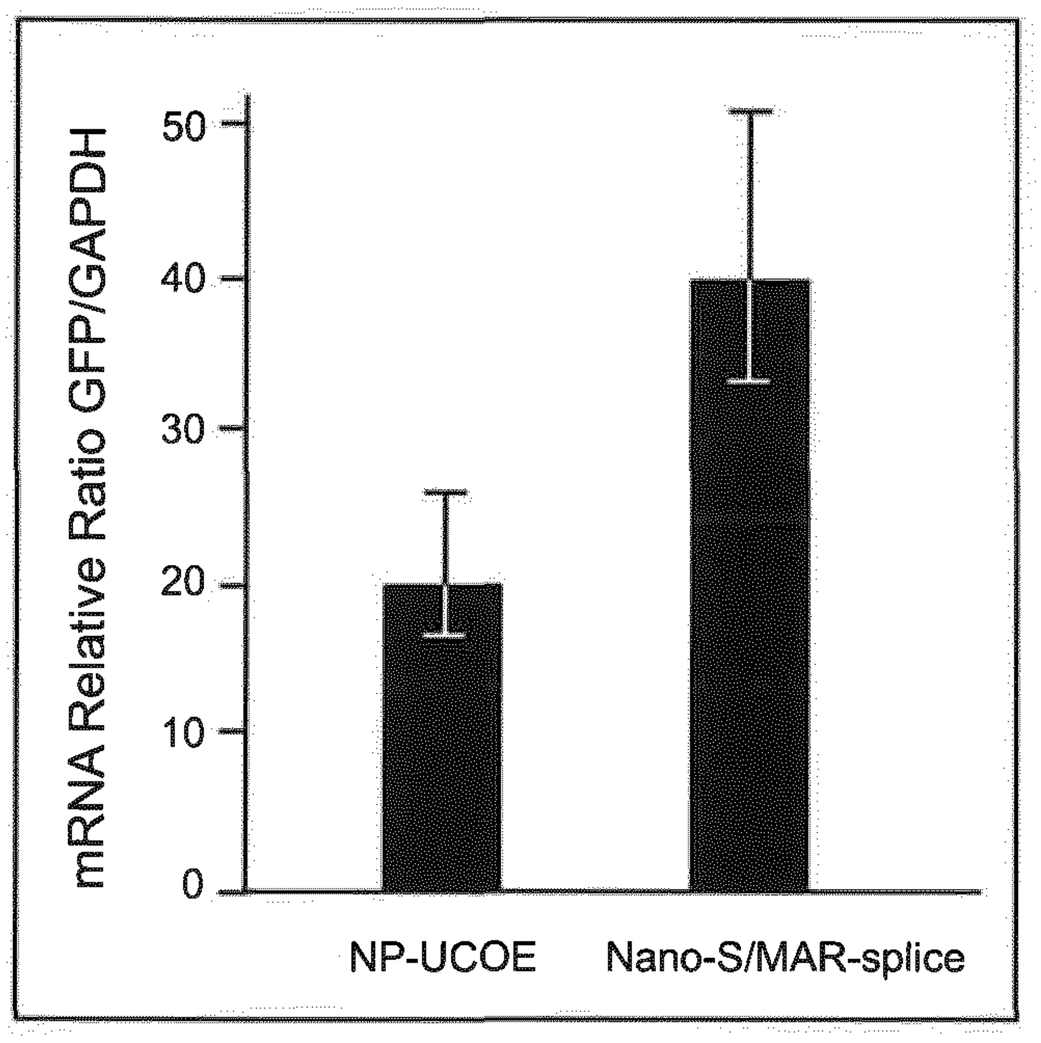
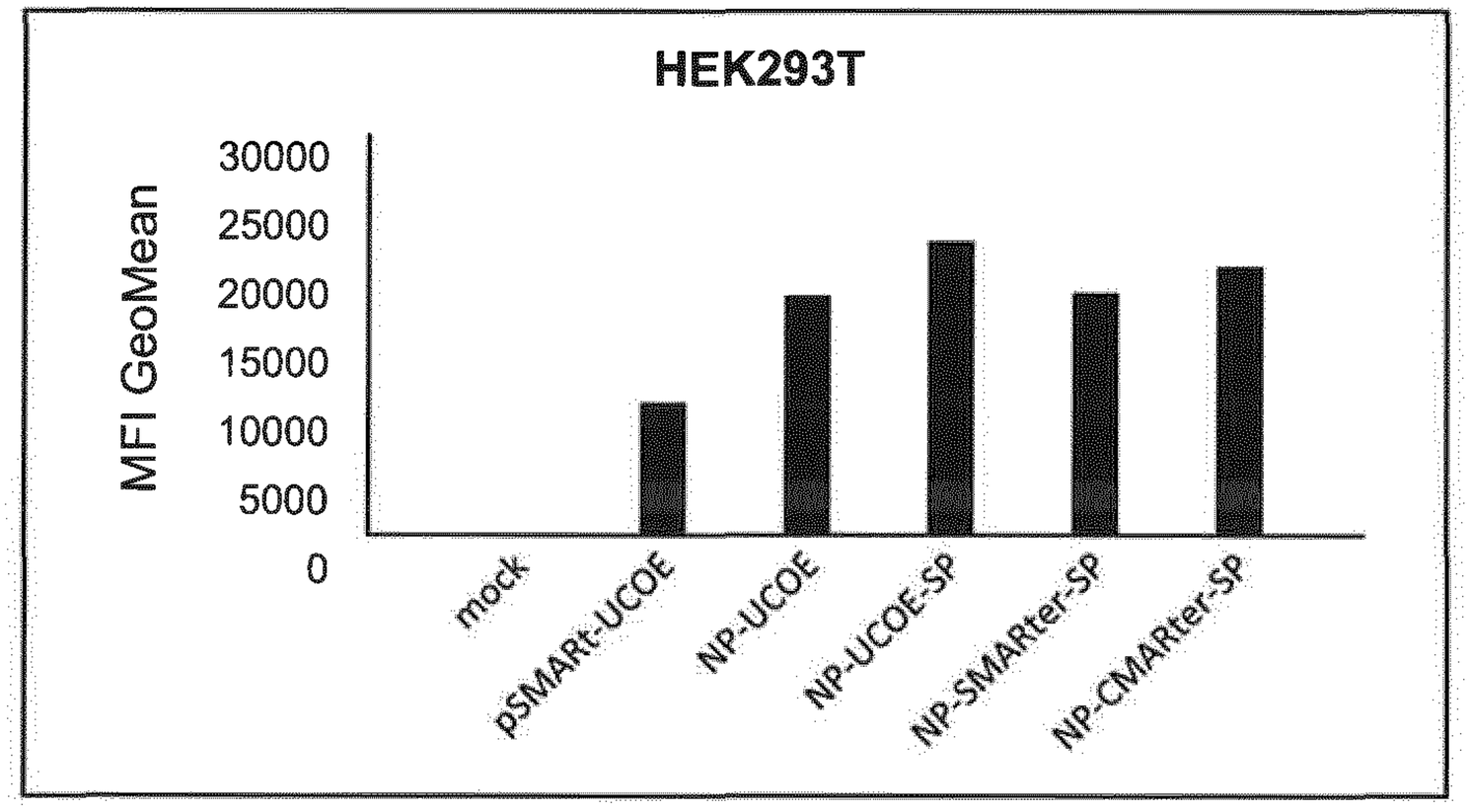

mRNA Relative Ratio GFP/GAPDH
50
40
30
20
10
0
NP-UCOE
Nano-S/MAR-splice

FIG 11


HEK293T
MFI GeoMean
30000
25000
20000
15000
10000
5000
0
mock
pSMARt-UCOE
NP-UCOE
NP-UCOE-SP
NP-SMARter-SP
NP-CMARter-SP

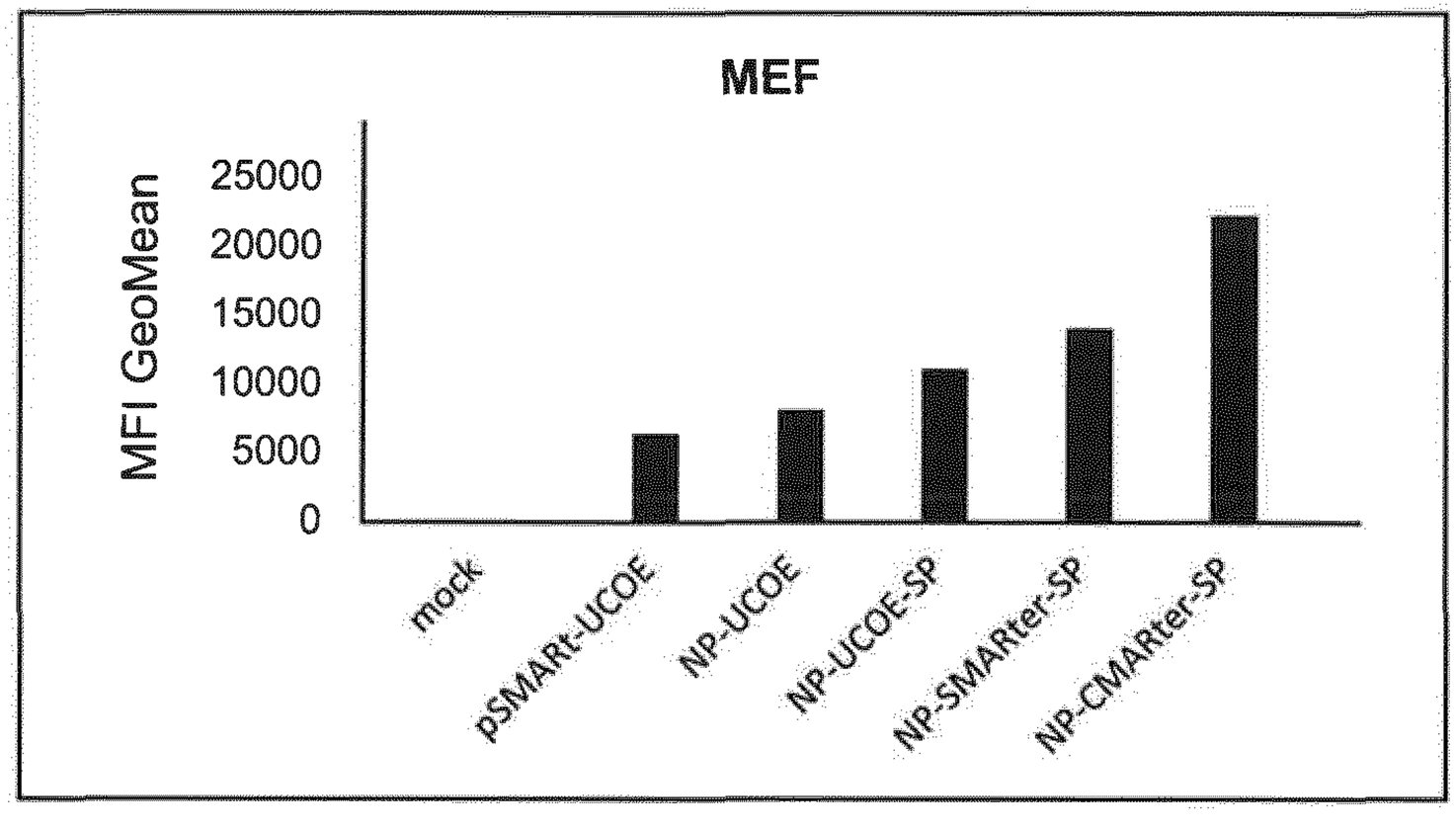
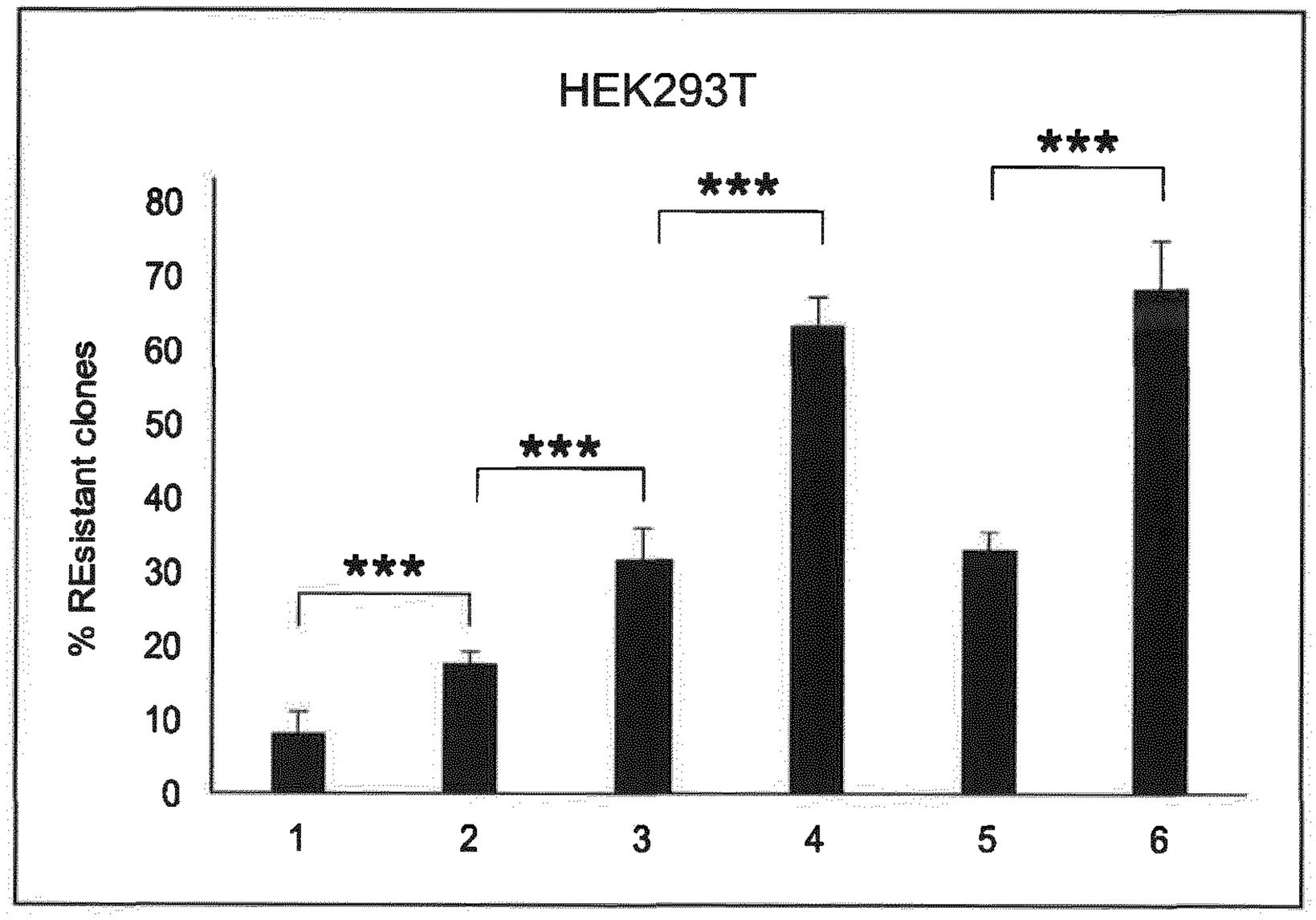
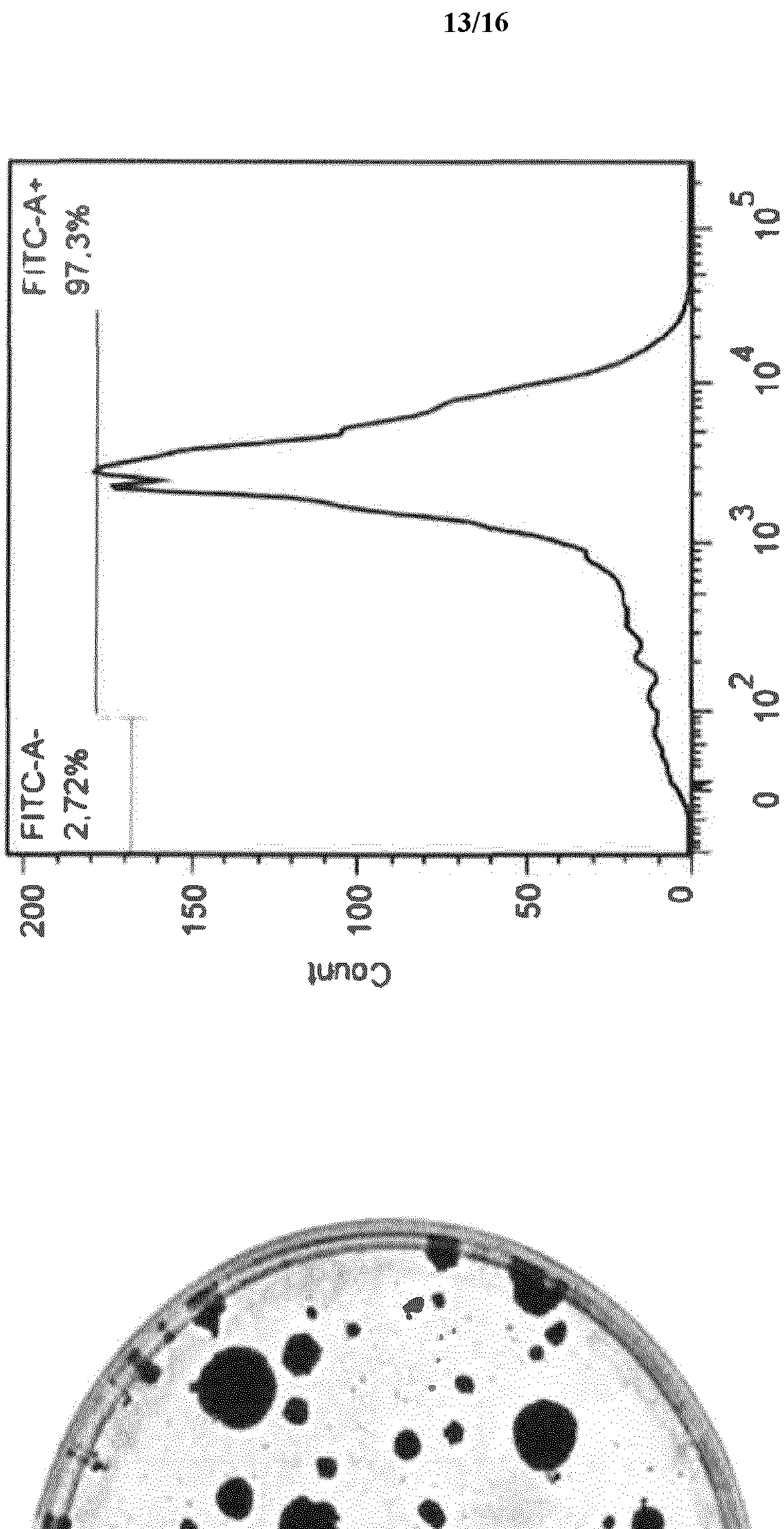

MEF
MFI GeoMean
25000
20000
15000
10000
5000
0
mock
pSMARt-UCOE
NP-UCOE
NP-UCOE-SP
NP-SMARter-SP
NP-CMARter-SP

FIG 12



A


FITC-A+
97,3%
FITC-A-
2,72%
Count
200
150
100
50
0
0
10^2
10^3
10^4
10^5
FITC-A

B

Fig. 13

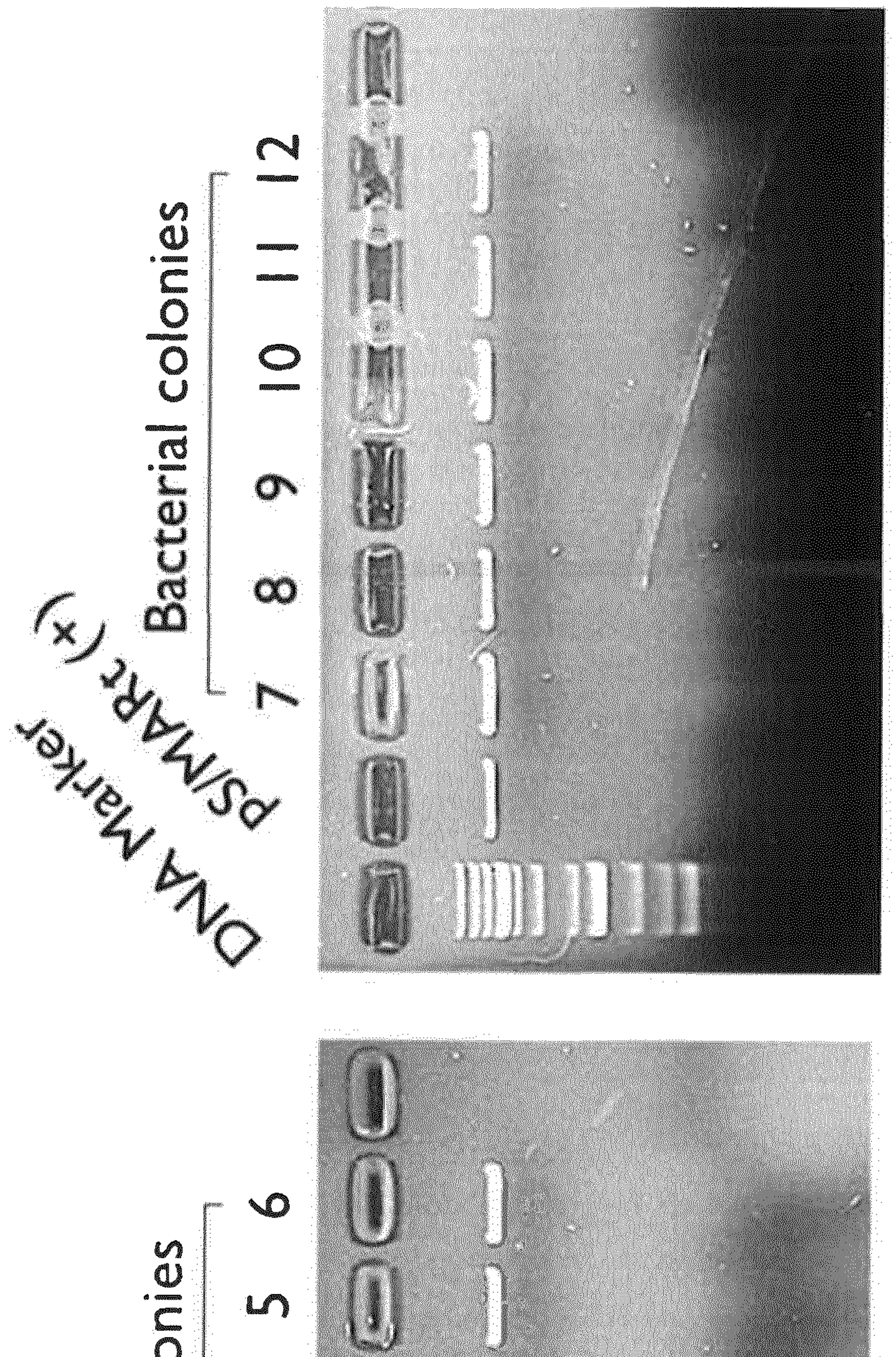

DNA Marker (x)
pSMART (x)
Bacterial colonies
1 2 3 4 5 6
DNA Marker (x)
pSMART (x)
Bacterial colonies
7 8 9 10 11 12

Fig.14

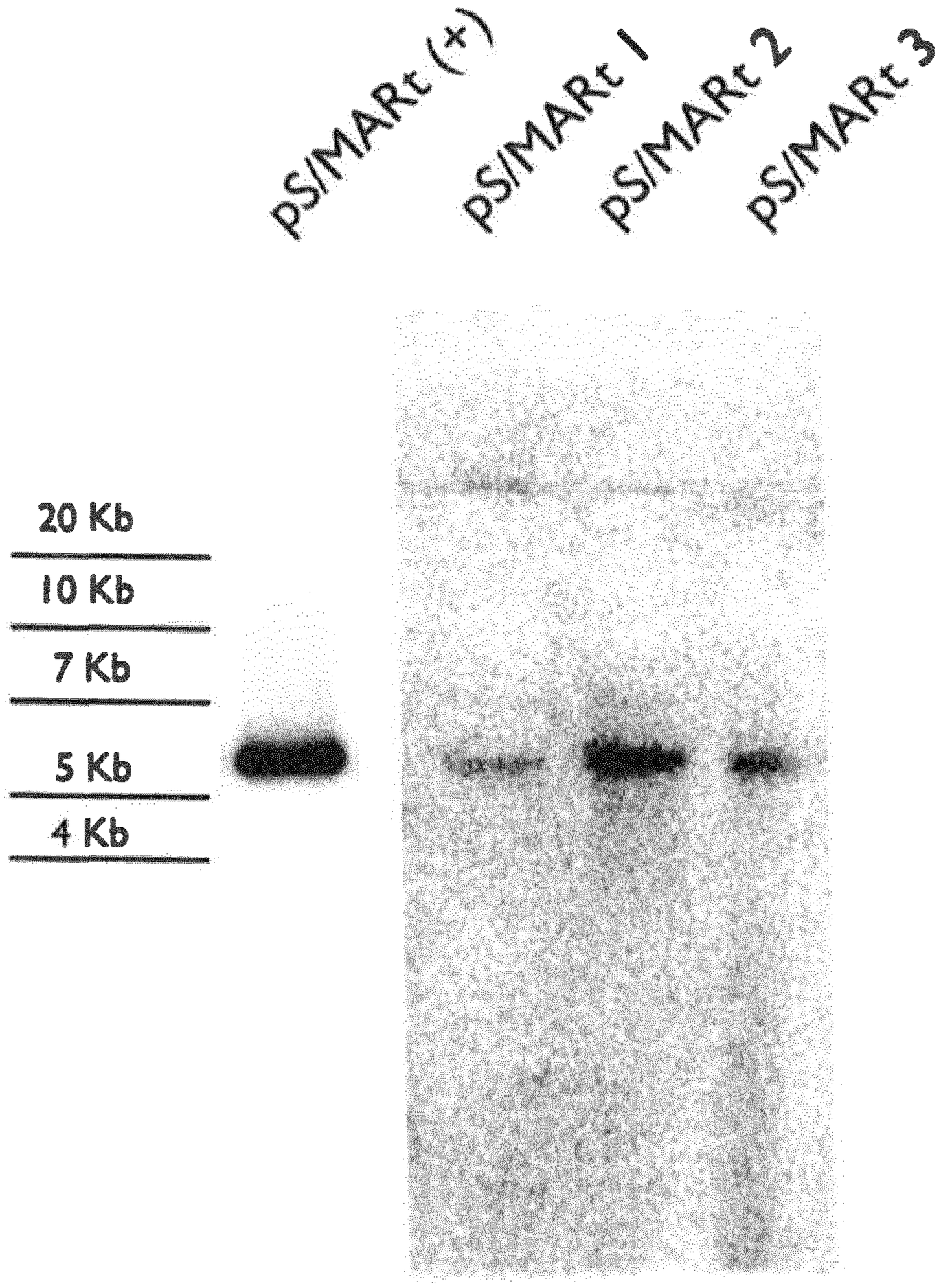


Fig. 15

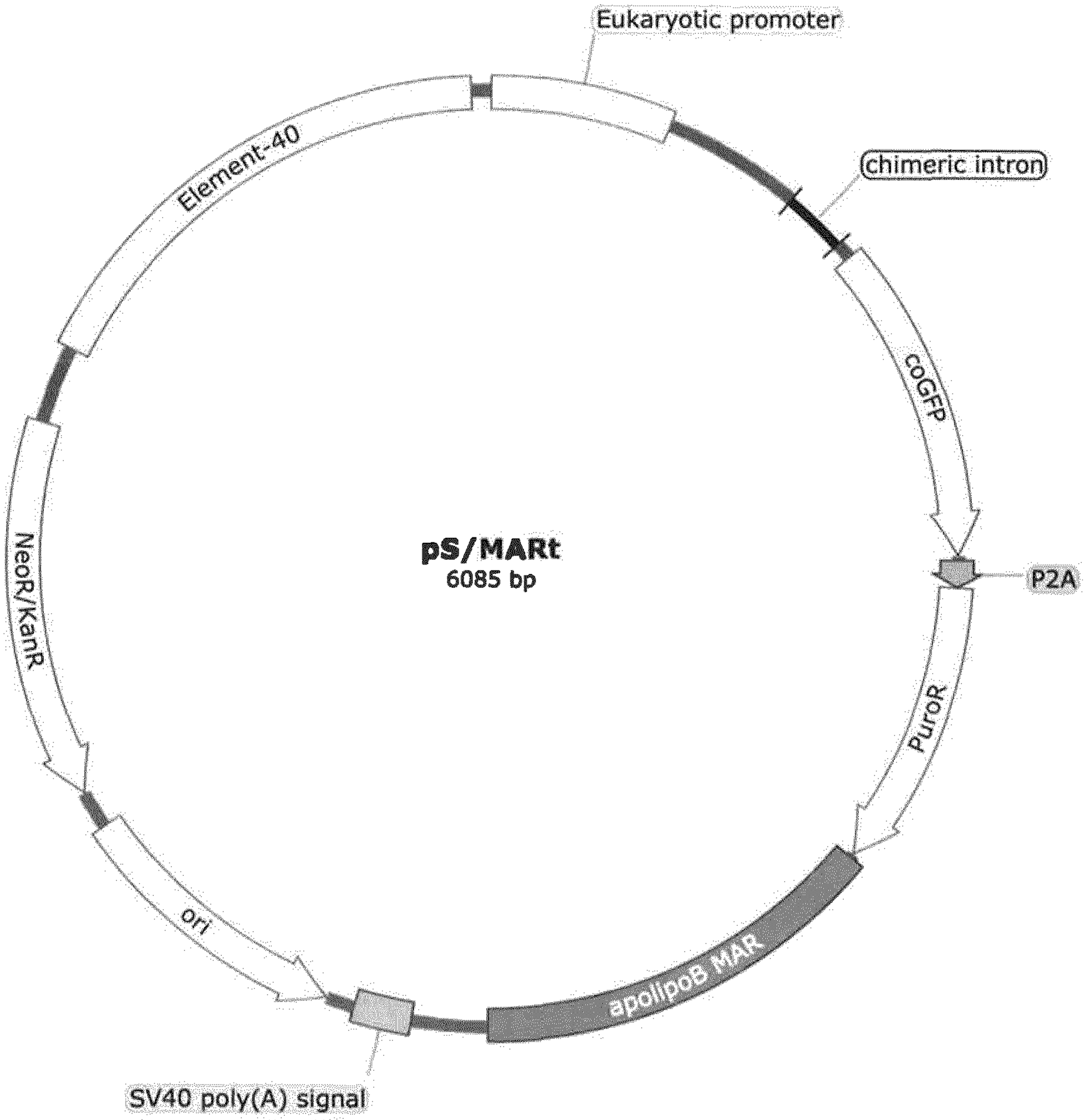

Eukaryotic promoter
chimeric intron
COGFP
P2A
PuroR
apolipoB MAR
SV40 poly(A) signal
ori
NeoR/KanR
Element-40
pS/MARt
6085 bp

Fig. 16