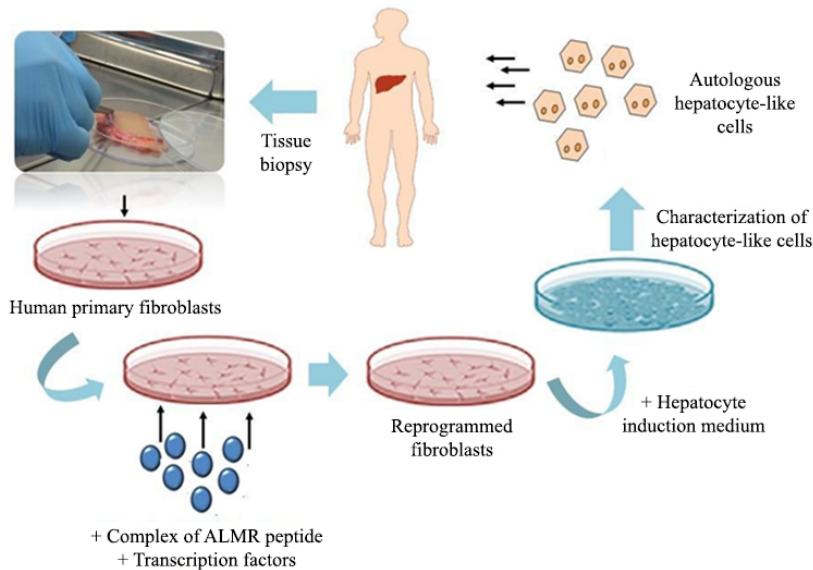


Supplementary 1.



Direct reprogramming of autologous hepatocyte-like cells.

Supplementary 2.

Primers for sequencing of *CEBPA*, *HNF4A*, and *NR1I2* in pcDNA3.1.

Genes	Primers	Sequences (5' to 3')	Length (Bases)
CaMV	Forward	CGC AAA TGG GCG GTA GGC GTG	21
BGH	Reverse	TAG AAG GCA CAG TCG AGG	18
<i>CEBPA</i>	Forward	ACA CGA AGC ACG ATC AGT CCA	21
	Reverse	CGC GCA CAT TCA CAT TGC AC	20
<i>HNF4A</i>	Forward	ACA TGG CCG ACT ACA GTG CT	20
	Reverse	ACG TGT CAT TGC CCA TCG TC	20
<i>NR1I2</i>	Forward	AGC TCT TTG GAG ATG GGG AGA TG	23
	Reverse	AGA CCC CTG CCA TGT TGT CA	20

Supplementary 3.

Ratio and volume of transfection mix.

Transfection Mix Ratio (Total 500 ng)	<i>CEBPA</i> (80 ng/μL)	<i>HNF4A</i> (109.83 ng/μL)	<i>NR1I2</i> (132.11 ng/μL)
1:1:1 (167 ng: 167 ng: 167 ng)	2.09 μL	1.52 μL	1.26 μL
1:2:1 (125 ng: 250 ng: 125 ng)	1.56 μL	2.28 μL	0.95 μL
1:3:1 (100 ng: 300 ng: 100 ng)	1.25 μL	2.73 μL	0.76 μL

Supplementary 4.**Induction medium composition and medium replacement steps.**

Day	Medium	Small Molecules
0	Serum-free α MEM complete medium	-
1-2	Serum-free α MEM complete medium	5 ng/mL BMP-4
		5 μ M LY294002
		40 ng/mL bFGF
		50 ng/mL Activin A
3	RPMI 1640 complete medium with HSA	40 ng/mL bFGF 50 ng/mL Activin A
4	RPMI 1640 complete medium with HSA	50 ng/mL Activin A
5-8	RPMI 1640 complete medium with HSA	25 ng/mL Activin A
9-21	HepatoZYME complete medium with FBS	5 ng/ml OSM
		25 ng/ml HGF

Supplementary 5.**Primers used in qRT-PCR of transfected fibroblasts.**

Genes	Primers	Sequences (5' to 3')	Length (Bases)
<i>CEBPA</i>	Forward	ACA CGA AGC ACG ATC AGT CCA	21
	Reverse	CGC GCA CAT TCA CAT TGC AC	20
<i>HNF4A</i>	Forward	ACA TGG CCG ACT ACA GTG CT	20
	Reverse	ACG TGT CAT TGC CCA TCG TC	20
<i>NR1I2</i>	Forward	AGC TCT TTG GAG ATG GGG AGA TG	23
	Reverse	AGA CCC CTG CCA TGT TGT CA	20
<i>ALB</i>	Forward	TGC TTT GCC GAG GAG GGT AA	20
	Reverse	AAG GCA GCT TGA CTT GCA GC	20
<i>GLUL</i>	Forward	CCC TGT GGA GCG CAA ACA A	19
	Reverse	GTC ATG GTG GAA GGT GTT CGT T	22
<i>CYP</i>	Forward	TCT CGG GAT ATG GTG TGA	18
	Reverse	CTC CAC ACT CCG CTT TCC CA	20

Supplementary 6.**Concentration and purity of recombinant plasmid.**

Plasmid	Size (bp)	Concentration (ng/ μ L)	A ₂₆₀ /A ₂₈₀
pcDNA3.1- <i>CEBPA</i>	1,084	361.7	1.88
pcDNA3.1- <i>HNF4A</i>	1,360	416.6	1.89
pcDNA3.1- <i>NR1I2</i>	1,312	381.2	1.88

Cebpa_NRA_1084
3445447_Cebpa-NRA_QNV-F
3441825_Cebpa-NRA_BHG-R
3441824_Cebpa-NRA_QNV-F
3445448_Cebpa-NRA_BHG-R (2)

cgccacacatgagtcgggcgacatttcta
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Cebpa_NRA_1084
3445447_Cebpa-NRA_CNV-F
3441825_Cebpa-NRA_BHG-R
3441824_Cebpa-NRA_CNV-F
3445448_Cebpa-NRA_BHG-R (2)

[illegible]

Cebpa_NRA_1084
3445447_Cebpa-NRA_CNV-F
3441825_Cebpa-NRA_BNG-R
3441824_Cebpa-NRA_CNV-F
3445448_Cebpa-NRA_BNG-R (2)

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Cebpa_NRA_1084
3445447_Cebpa-NRA_CNV-F
3441825_Cebpa-NRA_BNG-R
3441824_Cebpa-NRA_CNV-F
3445448_Cebpa-NRA_BNG-R (2)

[illegible]

Cebpa_NRA_1084
3445447_Cebpa-NRA_CNV-F
3441825_Cebpa-NRA_BHG-R
3441824_Cebpa-NRA_CNV-F
3445448_Cebpa-NRA_BHG-R (2)

[illegible]

S3

Cebpa_NBA_1084
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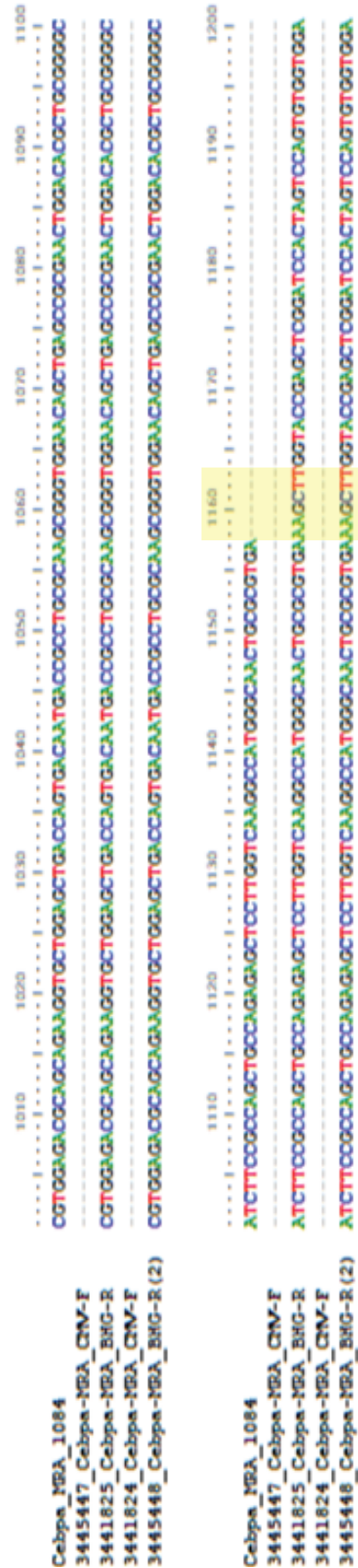
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Cebpa_NBA_1084
 3445447_Cebpa-NBA_CNMF
 3441825_Cebpa-NBA_BHG-R
 3441824_Cebpa-NBA_CNMF
 3445448_Cebpa-NBA_BHG-R (2)

Cebpa_NBA_1084
 3445447_Cebpa-NBA_CNMF
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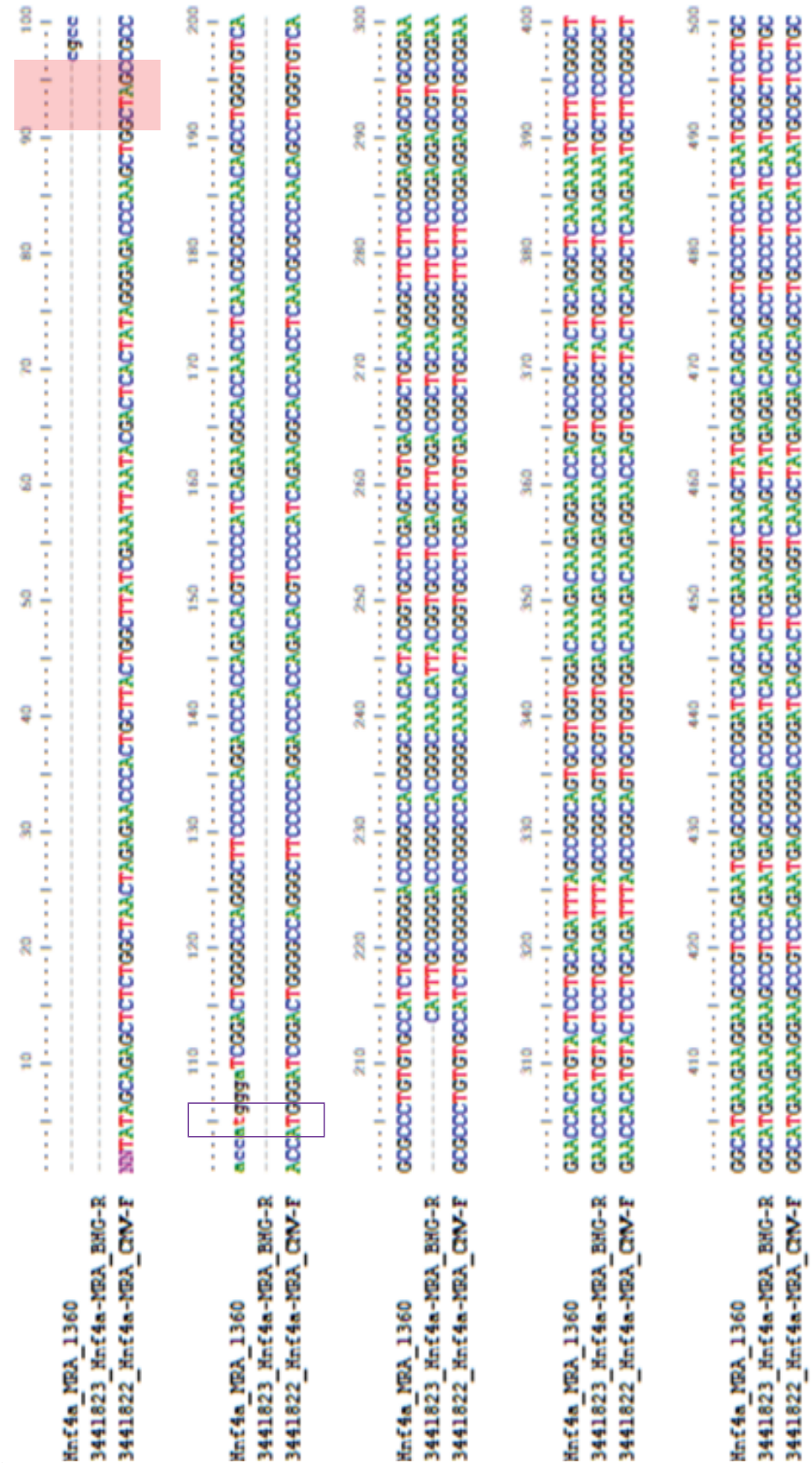
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 3445448_Cebpa-NBA_BHG-R (2)

Sequencing results of pcDNA3.1-CEBPA (cont.).

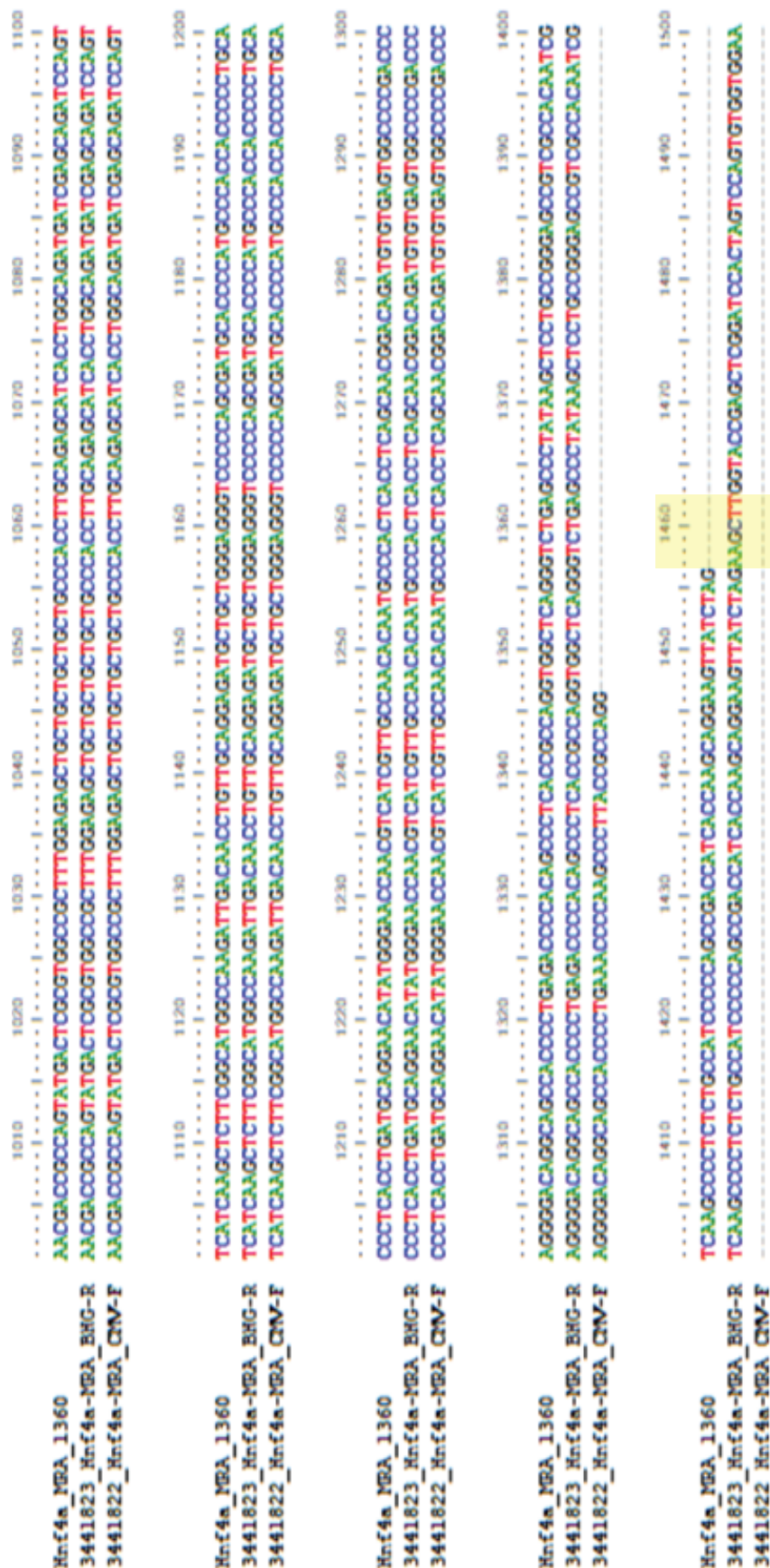


Sequencing results of pcDNA3.1-CEBPA (cont.). Yellow box: Restriction site of *Hind*III (AAG↓CTT).

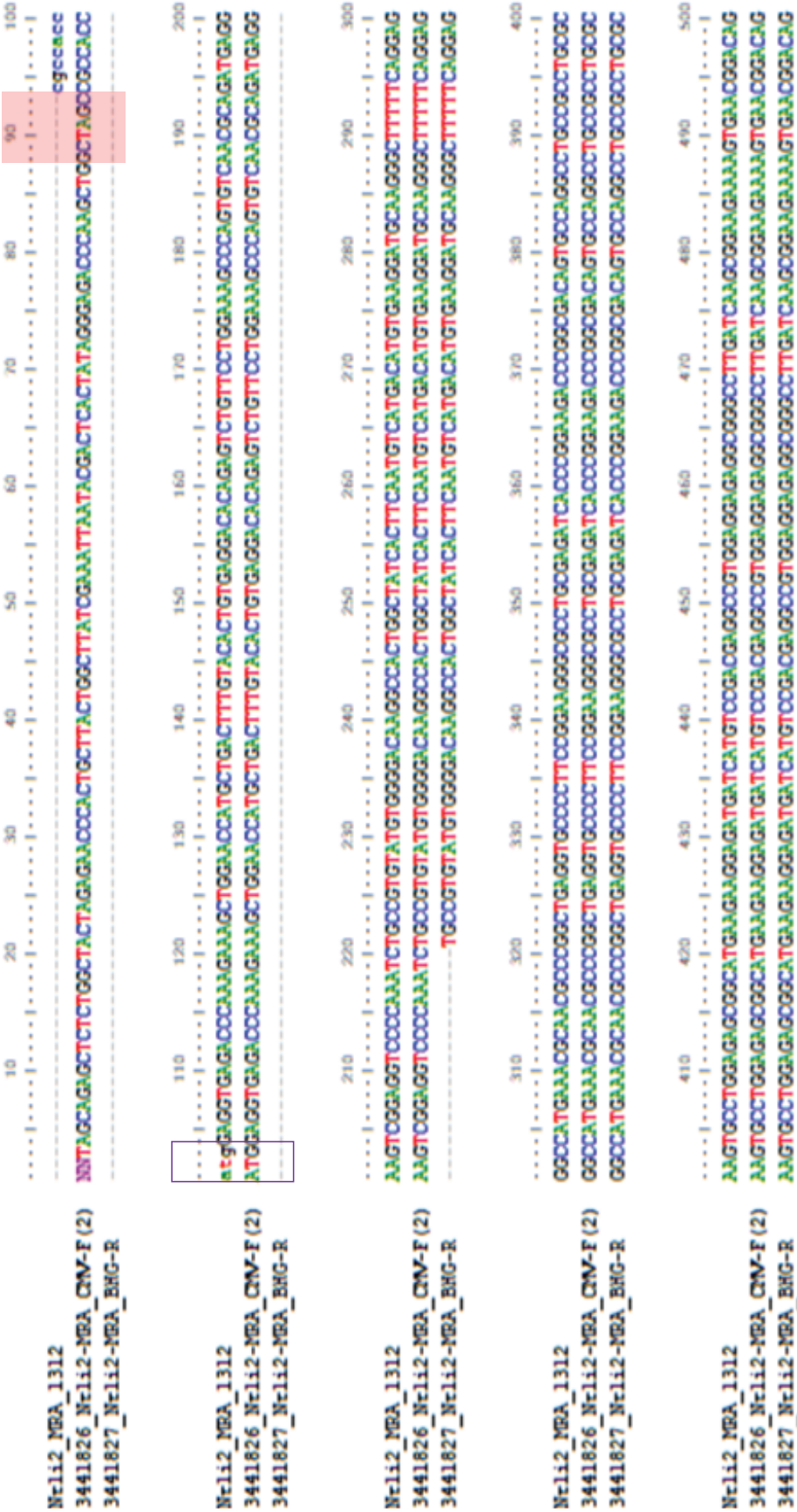
Supplementary 8.



Sequencing results of pcDNA3.1-HNF4A (cont.).

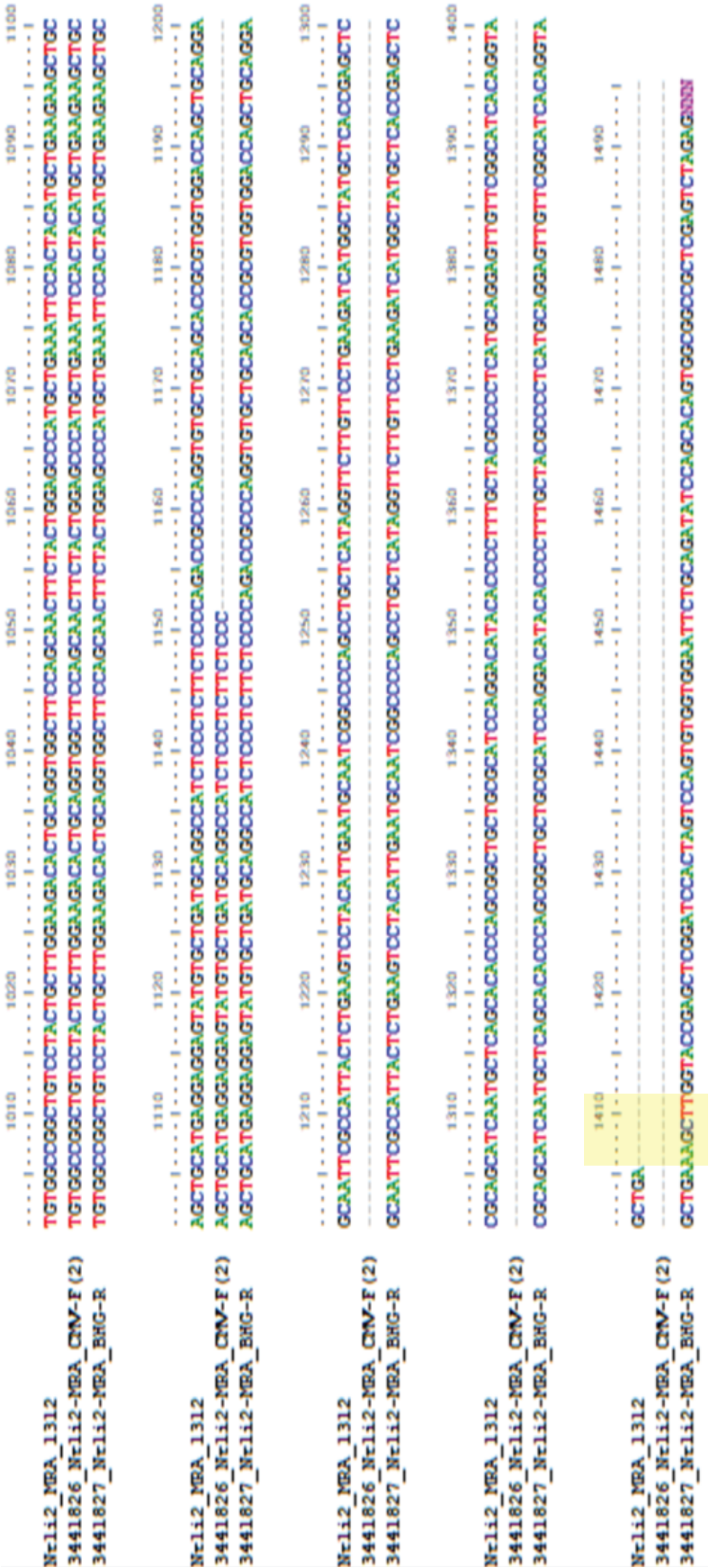


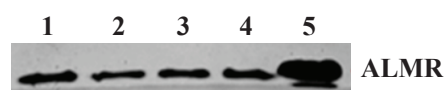
Supplementary 9.



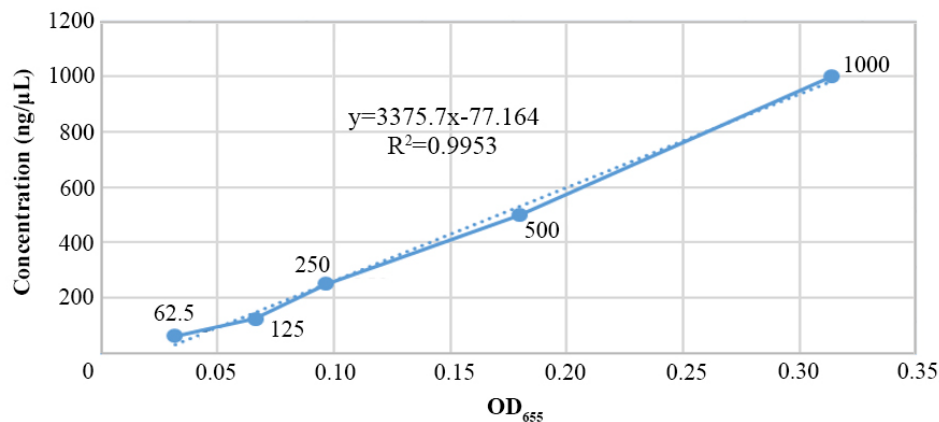
Sequencing results of pcDNA3.1-NR112. Red box: Restriction site of *NheI* (GCTJAGC); White box with purple outline: Start codon (ATG).



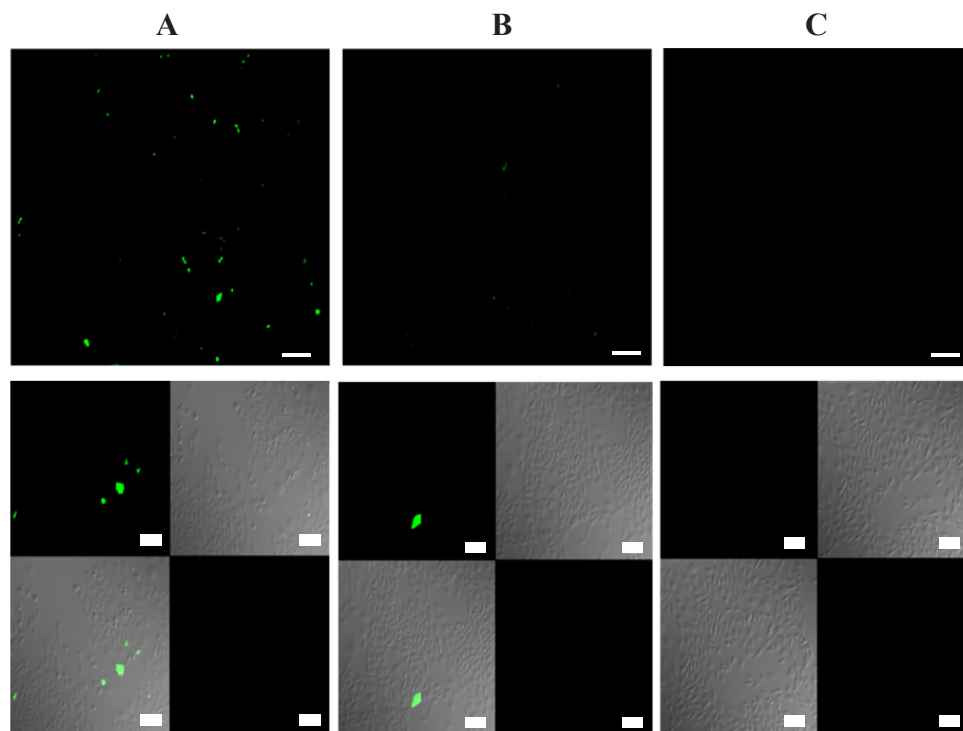


Supplementary 10.

SDS-PAGE results of purified ALMR (7.1 kDa). Electrophoresis was performed at 150 V for 30 minutes: 1: Elution 1; 2: Elution 2; 3: Elution 3; 4: Elution 4; 5: ALMR positive control.

Supplementary 11.

Measurement of ALMR peptide concentration by Lowry method.

Supplementary 12.

ALMR transfection to CHO-K1 cells. A: Lipofectamine system (0.5 mg/mL) with pcDNA-eGFP; B: ALMR system with pcDNA-eGFP (7:1 ratio); C: Control cells.

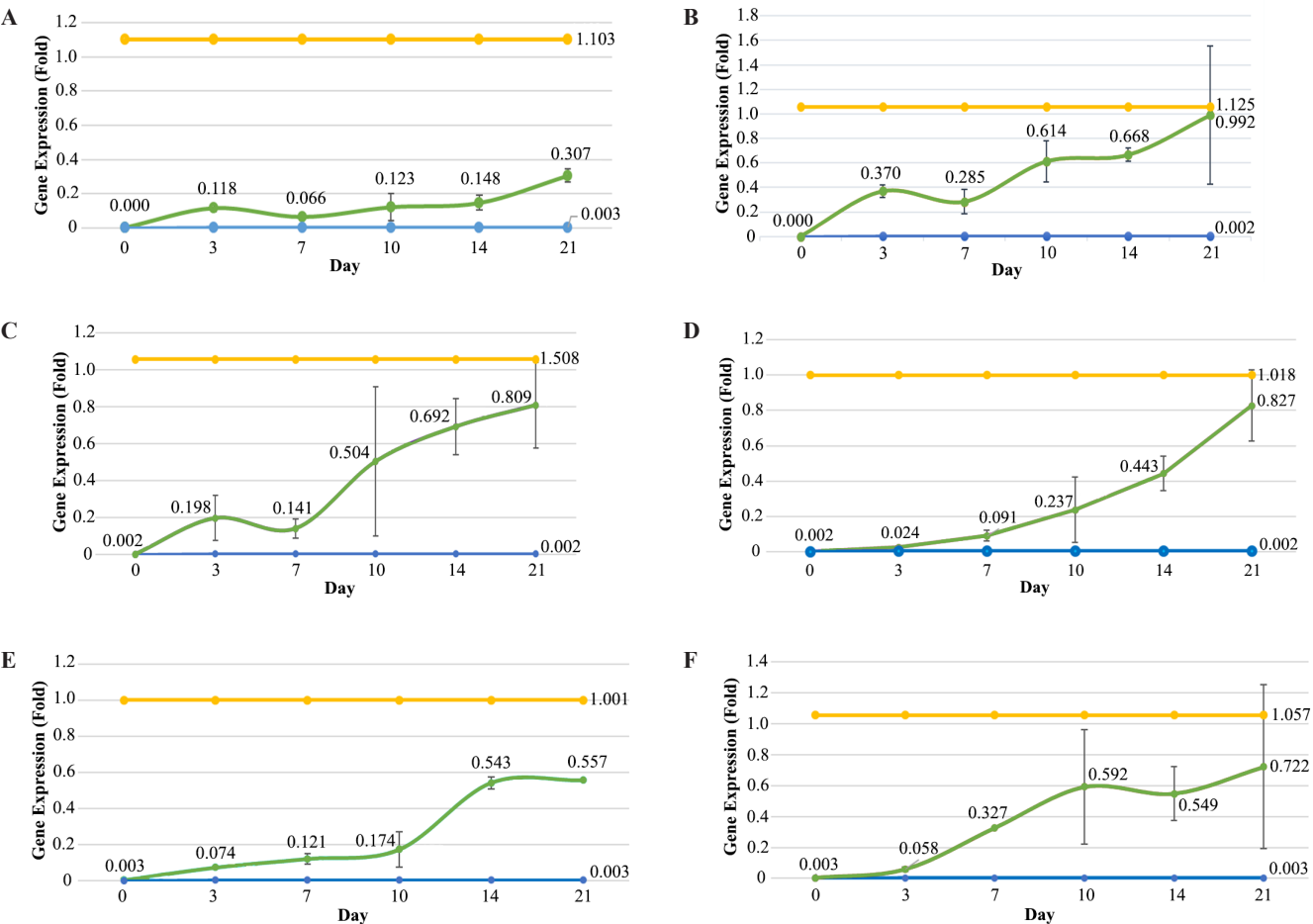
Supplementary 13.

PDT of BRED and PAL fibroblasts.

Fibroblasts	Passages	Number of Cells		Period (Days)	PDT
		Initial	Harvested		
PAL	P0-P1	8,000	2,600,000	10	1.198
	P1-P2	2,600,000	66,000,000	7	1.500
	P2-P3	650,000	8,575,000	3	0.806
BRED	P0-P1	40,000	750,000	10	2.365
	P0-P1*	267,000	2,600,000	11	3.350
	P0-P1**	690,000	5,150,000	7	2.414
	P1-P2	750,000	5,000,000	11	4.019
	P2-P3	650,000	2,300,000	7	3.840

*First re-explant; **Second re-explant.

Supplementary 14.



Gene expression of transcription factors and hepatocyte markers. A: *CEBPA*; B: *HNF4A*; C: *NR1I2*; D: *ALB*; E: *GLUL*; F: *CYP*. Blue line: Negative control (fibroblasts); Green line: Transfected fibroblasts; Yellow line: Positive control (rabbit liver).