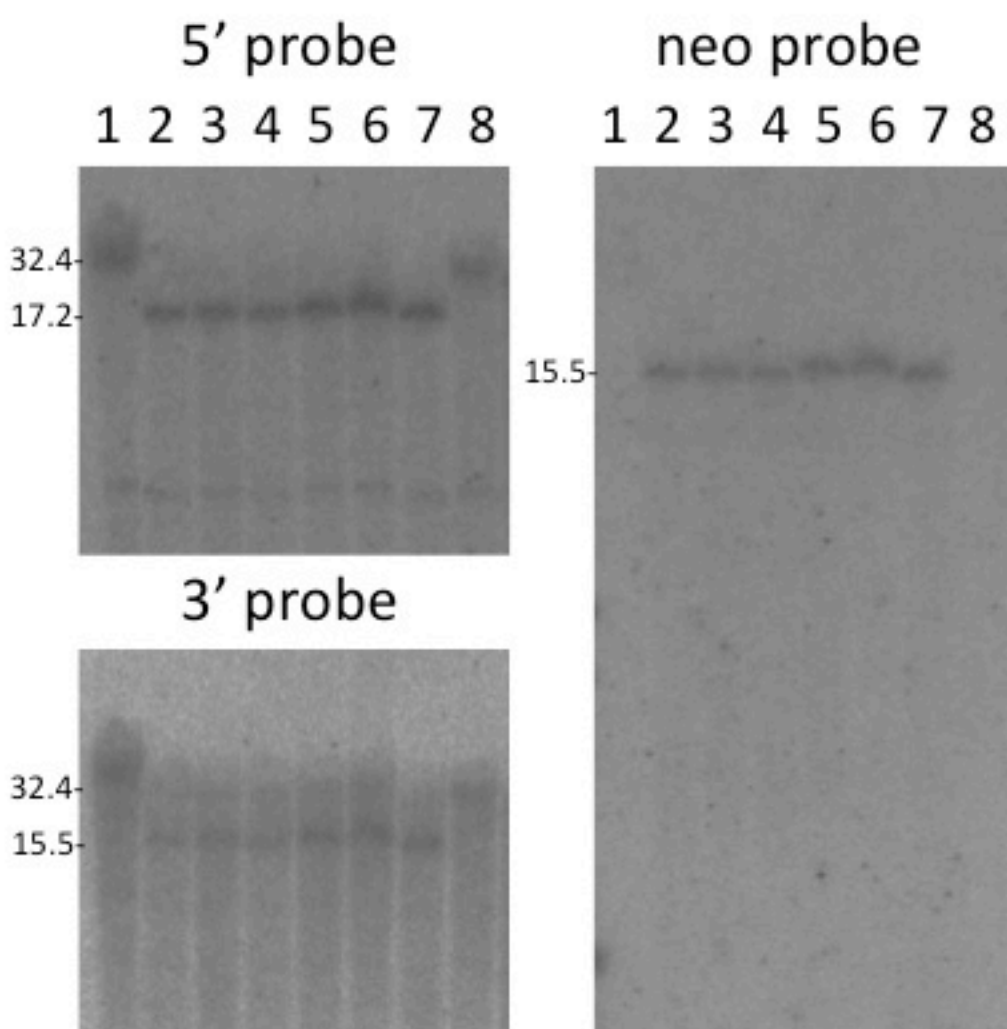


Figure S1. Examples of Southern analyses

a. hiPS cells / *HPRT1* knock-out

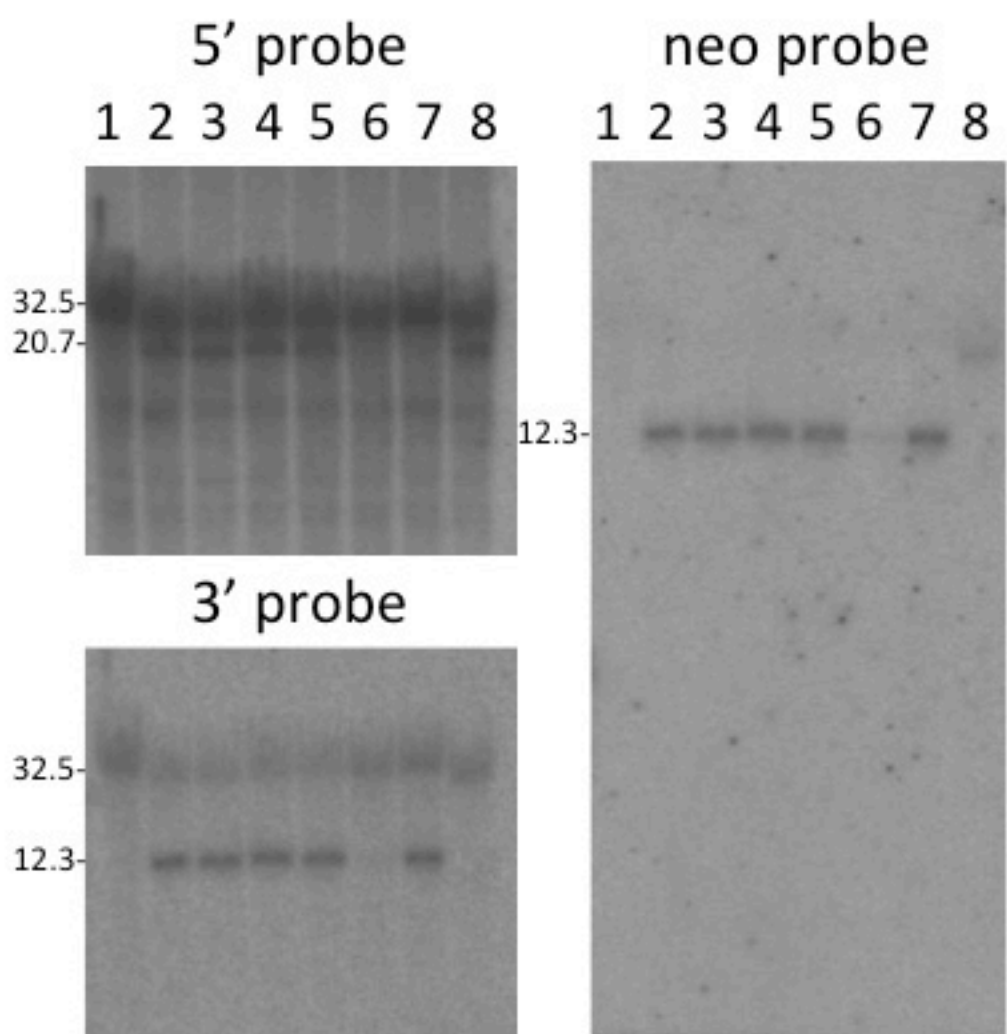


lane	clone	PCR	Southern			HR
			5'	3'	neo	
1	WT	×	×	×	×	
2	G1-12	○	○	○	○	○
3	G1-48	○	○	○	○	○
4	G1-121	○	○	○	○	○
5	G1-175	○	○	○	○	○
6	G1-183	○	○	○	○	○
7	H1-12	○	○	○	○	○
8	WT	×	×	×	×	

WT : parental cell line

G1-12, 48, 121, 175, 183, H1-12 :
accurate homologous recombinants

b. hiPS cells / *LIG1* knock-out



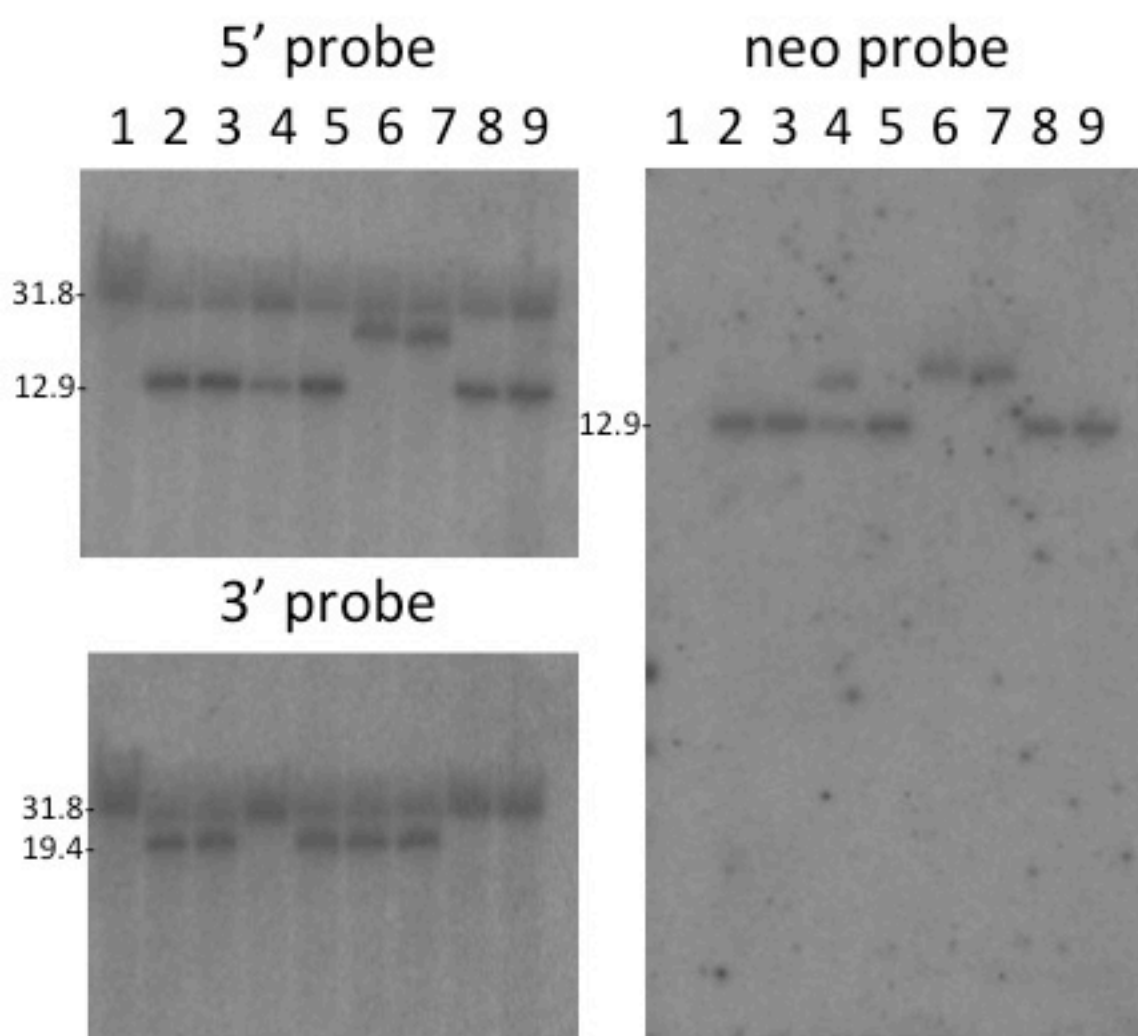
lane	clone	PCR		Southern			HR
		5'	3'	5'	3'	neo	
1	WT	×	×	×	×	×	
2	4	○	○	○	○	○	○
3	16	○	○	○	○	○	○
4	45	○	○	○	○	○	○
5	69	○	○	○	○	○	○
6	98	○	○	×	×	×	×
7	8	×	○	×	○	○	3' only
8	120	○	×	○	×	×	5' only

WT : parental cell line

#4, 16, 45, 69 : accurate homologous recombinants
 #98 : inaccurate homologous recombinants
 (positive PCR results)
 #8, 120 : inaccurate homologous recombinants
 (only one side is positive by PCR)

Figure S1. Examples of Southern analyses

c. hiPS cells / *LIG3* knock-out



lane	clone	PCR		Southern			HR
		5'	3'	5'	3'	neo	
1	WT	×	×	×	×	×	
2	3	○	○	○	○	○	○
3	72	○	○	○	○	○	○
4	110	○	×	○	×	○	5'only
5	180	○	○	○	○	○	○
6	100	×	○	×	○	○	3'only
7	123	×	○	×	○	○	3'only
8	166	○	×	○	×	○	5'only
9	177	○	×	○	×	○	5'only

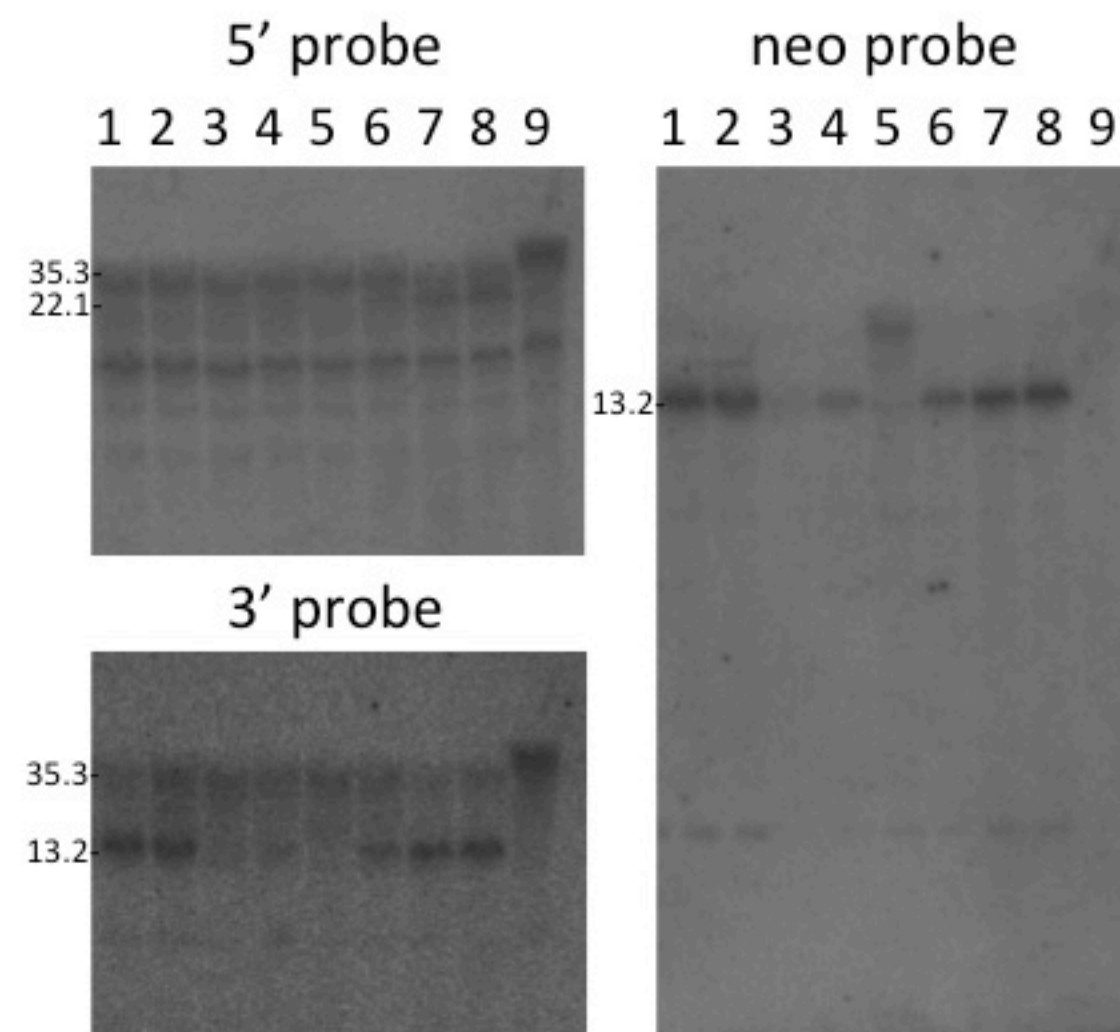
WT : parental cell line

#3, 72, 180 : accurate homologous recombinants

#100, 110, 123, 166, 177 : inaccurate homologous recombinants (only one side is positive by PCR)

#110 has additional random integration.

d. hiPS cells / *KU80* knock-out



lane	clone	PCR		Southern			HR
		5'	3'	5'	3'	neo	
1	263	×	○	×	○	○	3'only
2	283	×	○	×	○	○	3'only
3	171	×	×	×	×	×	×
4	1	×	×	×	×	×	×
5	251	×	×	×	×	○	×
6	201	○	○	○	○	○	○
7	111	○	○	○	○	○	○
8	61	○	○	○	○	○	○
9	WT	×	×	×	×	×	

WT : parental cell line

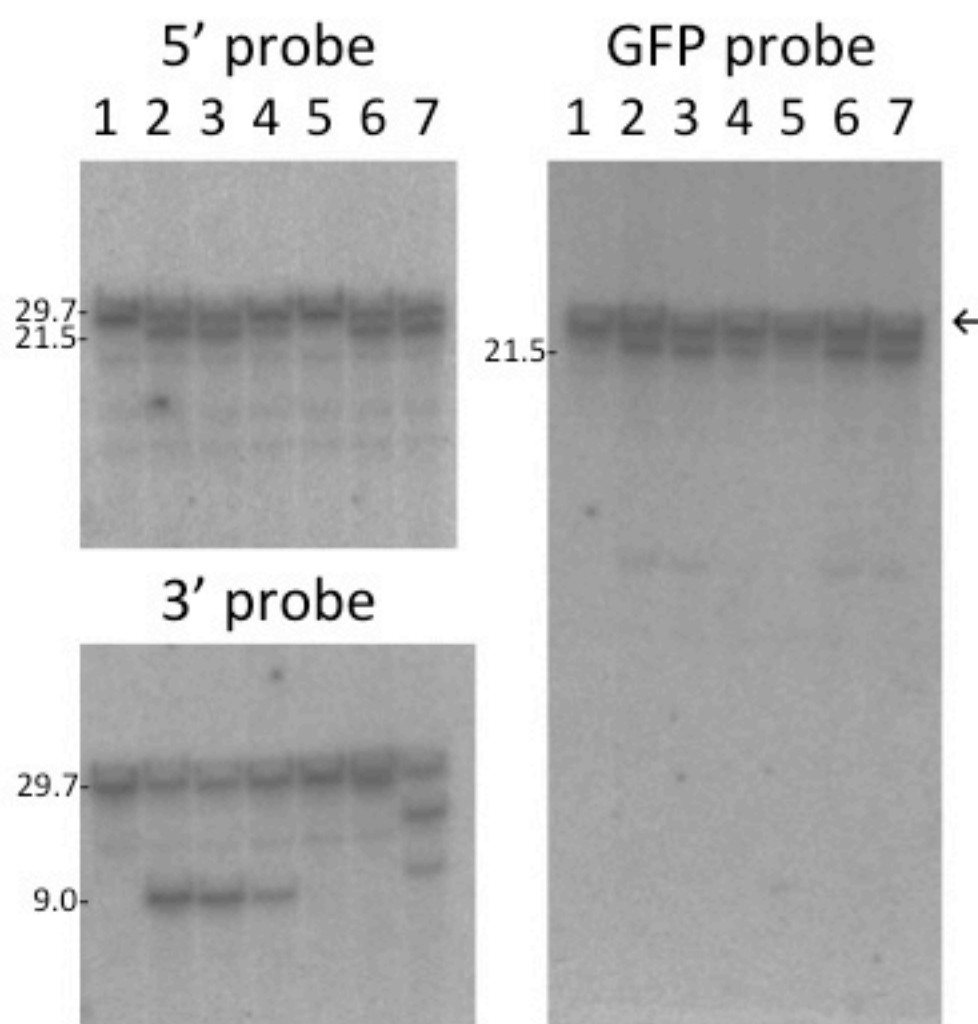
#61, 111, 201 : accurate homologous recombinants

#263, 283 : inaccurate homologous recombinants (only one side is positive by PCR)

#251 : random chromosomal integrant

Figure S1. Examples of Southern analyses

e. hiPS cells / *HB9*-GFP knockin



lane	clone	PCR		Southern			HR
		5'	3'	5'	3'	GFP	
1	WT	×	×	×	×	×	
2	24	○	○	○	○	○	○
3	72	○	○	○	○	○	○
4	130	○	○	○	○	○	○
5	181	×	×	×	×	×	×
6	242	○	○	×	○	○	5'only
7	302	○	○	×	○	○	5'only

WT : parental cell line

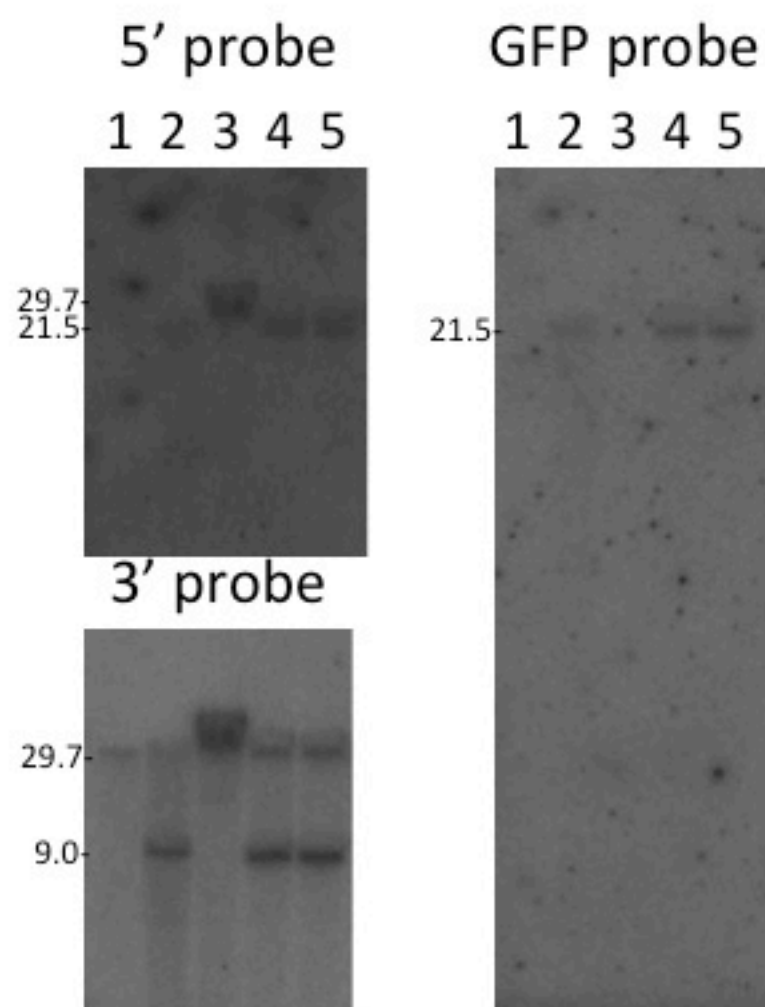
Arrow : endogenous GFP (pMXs-EGFP)

Only 5' PCR was performed.

#24, 72, 130 : accurate homologous recombinants

#242, 302 : inaccurate homologous recombinants

f. hES cells / *HB9*-GFP knockin



lane	clone	PCR		Southern			HR
		5'	3'	5'	3'	GFP	
1	43	×	×	×	×	×	×
2	G10	○	○	○	○	○	○
3	WT	×	×	×	×	×	
4	28	○	○	○	○	○	○
5	G1	○	○	○	○	○	○

WT : parental cell line

#28, G1, G10 : accurate homologous recombinants