A label-free strategy for visual genotyping based on phosphate induced coloration reaction

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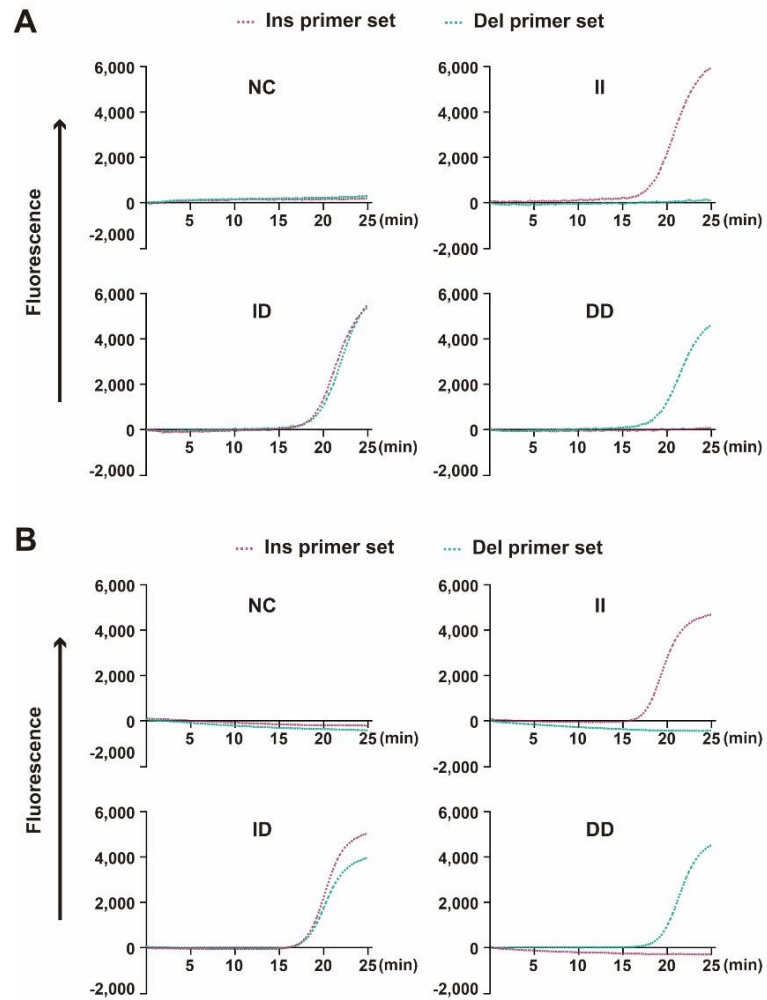[a] College of Life Sciences, Northwest University, Xi'an, 710069, China.

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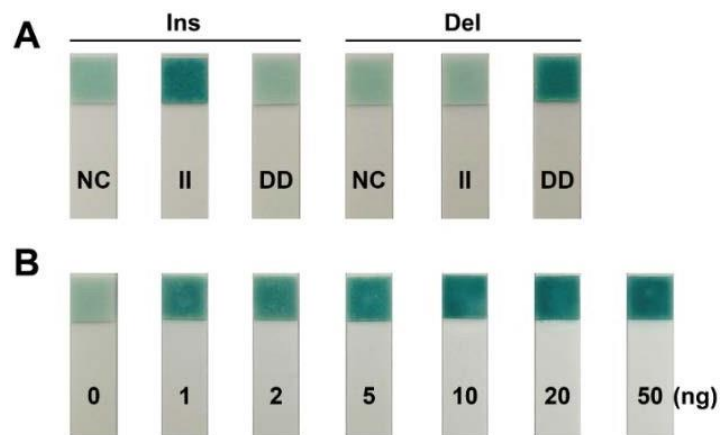[c] Shannxi Provincial Cancer Hospital, Xi'an, 710061, China.

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Fig. S1. The amplification kinetics curves of *ACE* indels genotyping with (A) genomic DNA

and (B) whole blood respectively.

Fig. S2. The response signal with (A) different combinations of primer set and variant and (B)

different concentrations of genome DNA.

Table. S1. Primer sequences

Primer	Sequence (5'-3')
F(PCR)	AGGAGAGGAGAGAGACTCAAGCAC
R(PCR)	GGACCCAAGTGCCAGTGATG
FIP-Ins	GTATCACGCCTGTAATCCCAGCACT-CCGGCTAATTTTTTGTATTTTTAGT
FIP-Del	CCACATAAAAGTGACTGTATAGGCAGCAG-AGGCCGGGGACTCTGTAAG
BIP-Ins	TTTCGCCAATTTTATTCCAGCTCTG-CTCCAGCCCTTAGCTCACCT
BIP-Del	TTTCGCCAATTTTATTCCAGCTCTG-CTCCAGCCCTTAGCTCACCT
LF-Ins	AAACGGTGAAACCCCGTCT
LF-Del	AAATGGGAGAAAGGATGGGA
LB-Ins	CTCTGAGCTCCCCTTACAAGC
LB-Del	CTCTGAGCTCCCCTTACAAGC
F3-Ins	GCTCTGTCGCCCAGGCT
F3-Del	AGGAGAGGAGAGAGACTCAAGCAC
B3-Ins	TCAGATCTGGTAGGGGTTTGAAT
B3-Del	TCAGATCTGGTAGGGGTTTGAAT

Note: Ins primer set consists of F3-Ins, B3-Ins, LF-Ins, LB-Ins, FIP-Ins and BIP-Ins, Del primer set consists of F3-Del, B3-Del, LF-Del, LB-Del, FIP-Del and BIP-Del.

Table S2. Chromatic difference between the positive and negative results

	Negative 1-Positive 1	Negative 2-Positive 2	Negative 3-Positive 3	Average
ΔE^*	17.7	15.43	15.7	16.28

Note: ΔE^* value greater than 6 indicates that chromatic difference can be distinguished by the human eye; $\Delta E^* = \sqrt{(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2}$

Table S3. Genotyping results of *ACE* indels

Phosphate induced coloration reaction	PCR-based electrophoresis			Total	Discrepant	Agreement
	II	ID	DD			
II	10	0	0	10	0	100%
ID	0	10	0	10	0	100%
DD	0	0	5	5	0	100%
Total	10	10	5	25	0	100%

The sequences of *ACE* insertion variant

AGGAGAGGAGAGAGACTCAAGCACGCCCCTCACAGGACTGCTGAGGCCCTGCAGGTGTCTGCAGCA
TGTGGCCCCAGGCCGGGGACTCTGTAAGCCACTGCTGGAGAGCCACTCCCATCCTTTCTCCCATTTCT
CTAGACCTGCTGCCTATACAGTCACTTTTTTTTTTTTGAGACGGAGTCTCGCTCTGTCGCCCAGGCTG
GAGTGCAGTGGCGGGATCTCGGCTCACTGCAAGCTCCGCCTCCCGGGTTCACGCCATTCTCCTGCCTC
AGCCTCCCAAGTAGCTGGGACCACAGGCGCCCGCCACTACGCCCGGCTAATTTTTTGTATTTTTAGTAG
AGACGGGGTTTCACCGTTTTAGCCGGGATGGTCTCGATCTCCTGACCTCGTGATCCGCCCGCCTCGGC
CTCCCAAAGTGCTGGGATTACAGGCGTGATACAGTCACTTTTATGTGGTTTCGCCAATTTTATTCCAGC
TCTGAAATTCTCTGAGCTCCCCTTACAAGCAGAGGTGAGCTAAGGGCTGGAGCTCAAGGCATTCAAA
CCCCTACCAGATCTGACGAATGTGATGGCCACGTCCCGGAAATATGAAGACCTGTTATGGGCATGGG
AGGGCTGGCGAGACAAGGCGGGGAGAGCCATCCTCCAGTTTTACCCGAAATACGTGGAACTCATCA
ACCAGGCTGCCCGGCTCAATGGTGAGTCCCTGCTGCCAACATCACTGGCACTTGGGTCC

The sequences of *ACE* deletion variant

AGGAGAGGAGAGAGACTCAAGCACGCCCCTCACAGGACTGCTGAGGCCCTGCAGGTGTCTGCAGCA
TGTGGCCCCAGGCCGGGGACTCTGTAAGCCACTGCTGGAGAGCCACTCCCATCCTTTCTCCCATTTCT
CTAGACCTGCTGCCTATACAGTCACTTTTATGTGGTTTCGCCAATTTTATTCCAGCTCTGAAATTCTCT
GAGCTCCCCTTACAAGCAGAGGTGAGCTAAGGGCTGGAGCTCAAGGCATTCAAACCCCTACCAGATC
TGACGAATGTGATGGCCACGTCCCGGAAATATGAAGACCTGTTATGGGCATGGGAGGGCTGGCGAG
ACAAGGCGGGGAGAGCCATCCTCCAGTTTTACCCGAAATACGTGGAACTCATCAACCAGGCTGCCCG
GCTCAATGGTGAGTCCCTGCTGCCAACATCACTGGCACTTGGGTCC