ICS 07.080
C 04

SZDB/Z

SZDB/Z 238—2017

Technical Specification for Authentication of Human Cell Lines by Short Tandem Repeats Genotyping Method

2017-04-01 2017-05-01

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1 1

2 1

3 1

4 2

5 2

6 3

7 3

8 5

9 5

10 5

A STR 6

B STR 7

C STR 8

.....9

GB/T 1.1-2009

STR

2015

/

National

Institute of Standards and Technology NIST STR

Authentication of Human Cell Lines: Standardization of STR Profiling ANSI/ATCC

ASN-0002-2011 STR

“ ” STR 9

STR STR

STR STR

1

STR

2

GB/T 1.1-2009 1

GB 19489-2008

GB/T 22278-2008

GB/T 27025-2008

SZDB/Z 124-2015 HLA

ANSI/ATCC ASN-0002-2011 Authentication of Human Cell Lines: Standardization of STR Profiling

3

3.1

Cell Line

3.2

Short Tandem Repeats

2 5 5~50

3.3

Cross-contamination

3.4

Genotyping

DNA DNA DNA

3.5

DNA Ladder

DNA DNA
n DNA
DNA DNA Ladder DNA

4

ATCC American Type Culture Collection
DNA Deoxyribonucleic Acid
DSMZ Deutsche Sammlung von Mikroorganismen und Zellkulturen
JCRB JCRB Japanese Collection of Research Bioresources Cell Bank
NIST National Institute of Standards and Technology
OD Optical Density
PBS Phosphate Buffer Solution
PCR Polymerase Chain Reaction
STR Short Tandem Repeats

5

5.1

5.1.1

a) PBS PBS
b)
c)
d) PBS
e)

5.1.2

a)
b) PBS
c)

5.1.3 1×10^6

5.1.4 1 mL PBS 2 mL

5.2 DNA

5.2.1 DNA DNA ≥ 20 μL ≥ 50 ng/μL A260/A280 1.8~2.0

5.2.2 DNA DNA DNA 1.5 mL DNA SDS

5.3

5.3.1

5.3.2 DNA DNA A260/280

6

6.1 PBS (4~8) 24

6.2 DNA DNA DNA 4~8 48

7

7.1 STR A

7.2 GB/T 27025-2008

7.3

a)
b) 5

7.4 DNA

a) DNA DNA
b) DNA A260/A280 A260/A280 1.8~2.0
c) DNA DNA ≥ 20 μL ≥ 50 ng/μL
d) DNA -20 6 -80

7.5 PCR

a) 9 STR D13S317 TH01 D5S818 D16S539 TPOX D7S820 CSF1PO vWA Amelogenin (AMEL) PCR STR PCR STR

STR PCR

b) PCR

PCR DNA PCR

DNA PCR

c) PCR PCR

7.6 STR

a) STR 7.5 PCR

DNA DNA Ladder

b)

c) a) PCR DNA b)

8.5 μL~8.8

μL 0.2 μL~0.5 μL PCR /DNA Ladder 0.5 μL~1.5 μL

d) PCR

7.7 STR

STR

ATCC http://www.atcc.org/STR_Database.aspx

STR

STR DSMZ

https://www.dsmz.de/services/services-human-and-animal-cell-lines/ online-str-analysis.html JCRB

JCRB http://cellbank.nibiohn.go.jp/ legacy/cgi- bin2/str2/str_searchform3.cgi Cellosaurus

http://web.expasy.org/cellosaurus/CVCL_0030

7.8

7.8.1

a) PCR STR

b) STR 1

2

c) b)

7.8.2

a) STR STR 2

b) STR STR 2

PCR

7.8.3

a) STR STR

80%

b) STR STR
80% 56%

c) STR STR
56%

8

8.1

8.2 STR
B

9

DNA
STR C

10

10.1

10.2 GB/T
22278-2008 GB/T 27025-2008

10.3

10.4 PCR

B

STR

1

1 STR

2 STR

Loci Human	Allele 1	Allele 2	Allele 3
D5S818			
D13S317			
D7S820			
D16S539			
vWA			
TH01			
TPOX			
CSF1PO			

3 STR

Designation Human	Atcc number	% Match	D5S818	D13S317	D7S820	D16S539	vWA	TH01	TPOX	CSF1PO	AMEL	…
e.g Hela	CCL-2	31.25	11,12	12,13.3	8,12	9,10	16,18	7	8,12	9,10	X	…

2

1. 9 STR AMEL D5S818 D13S317 D7S820 D16S539 vWA TH01 TPOX CSF1PO

2. 9 STR

3.

C

STR

1.
2. **@mail.com

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[1] Chatterjee R., Cell biology. Cases of mistaken identity. Science , 2007. 315 (5814): p. 928-31.
[2] Neimark J., Line of attack. Science, 2015. 347 (6225): p. 938-40.
[3] Zhao M., et al., Assembly and initial characterization of a panel of 85 genomically validated cell lines from diverse head and neck tumor sites. Clin Cancer Res, 2011. 17 (23): p.7248-64.
[4] McLaren,R.S., Y. Reid, and D.R. Storts Human cell line authentication: the critical first step in any project using human cell lines. Methods Mol Biol, 2013. 963 : p. 341-53.
[5] Announcement: Time to tackle cells' mistaken identity. Nature, 2015. 520 (7547): p. 264-264.
[6] ANSI/ATCC, Authentication of Human Cell Lines: Standardization of STR Profiling. 2011, ASN-0002-2011.
[7] Masters JR., et al., Short tandem repeat profiling provides an international reference standard for human cell lines. Proc Natl Acad Sci U S A, 2001. 98 (14): p. 8012-7.
[8] American Type Culture Collection Standards Development Organization Workgroup, A.S.N., Cell line misidentification: the beginning of the end. Nat Rev Cancer, 2010. 10 (6): p. 441-8.
[9] Ronald J, Duffy KJ, et al. Loss of Heterozygosity Detected in a Short Tandem Repeat (STR) Locus Commonly Used for Human DNA Identification. Journal of Forensic Sciences. 2000;45(5):1087–1089.
[10] Reid Y, Storts D, Riss T, and Minor L, Authentication of Human Cell Lines by STR DNA Profiling Analysis, in Assay Guidance Manual, G.S. Sittampalam, N.P. Coussens, H. Nelson, M. Arkin, D. Auld, C. Austin, B. Bejcek, M. Glicksman, J. Inglese, P.W. Iversen, Z. Li, J. McGee, O. McManus, L. Minor, A. Napper, J.M. Peltier, T. Riss, O.J. Trask, Jr., and J. Weidner, Editors. 2004: Bethesda (MD).
[11] Cell Line Authentication Test Recommendations. www.atcc.org