STR Authentication: Using the ATCC public STR Database

Brief Tutorial March 2016







STR Profile Background

- The ATCC STR database includes profile standards for all distributed cell lines.
- 8 loci are enough to authenticate a cell line for research and publication purposes.
- ATCC uses STR analysis to screen all human cell lines for authenticity and purity before distribution providing a true baseline for researchers using these cell lines.
- Comparing an STR profile using the ATCC database will provide a measureable relationship between the tested cells and accepted standard cell lines.
- Tumor and transformed cell lines are more prone to genetic drift which can accelerate with passage number, media content and other factors.
- STR profiles assume two alleles; the presence of more than two alleles in DNA from normal cells indicates genomic heterogeneity, which is typically equated with contamination or genetic instability. Some cell lines may have more than 2 alleles at a loci as they are generally not normal cells. See the example on the last page.

Cell authentication services are available from ATCC www.atcc.org/str



Using the Public STR Database



SEARCH THE	
As part of our continui ATCC has developed a cell lines. <u>View our brie</u>	ng efforts to characterize and authenticate the cell lines in the Cell Biology collection, comprehensive database of short tandem repeat (STR) DNA profiles for all of our humar if tutorial before starting.
 <u>STR Profiling Analys</u> <u>Matching Algorithm</u> <u>Interrogating the Dat</u> 	sis tabase
Search by A	TCC Number:
	Search Clear
	OR
Search by A	melogenin (AMEL) + at least 7 loci:
Search by A Separate each al	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus D5S818:	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus D5S818: D13S317:	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus D5S818: D13S317: D7S820:	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus D5S818: D13S317: D7S820: D16S539:	melogenin (AMEL) + at least 7 loci: llele entry with a comma (e.g., CSF1PO = 11, 12)
Search by A Separate each al AMEL: Plus D5S818: D13S317: D7S820: D16S539: vWA:	melogenin (AMEL) + at least 7 loci: Ilele entry with a comma (e.g., CSF1PO = 11, 12)
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Search by A Separate each al AMEL: Plus D5S818: D13S317: D7S820: D16S539: VWA: TH01: TPOX: CSF1PO:	melogenin (AMEL) + at least 7 loci: Ilele entry with a comma (e.g., CSF1PO = 11, 12)

Go to the STR service landing page or directly to the database <u>https://www.atcc.org/STR_Database.</u> <u>aspx?slp=1</u>

There is a very simple registration required to access the database.





There are 2 Choices

1. Select either search by ATCC number to obtain an STR profile standard	Search by ATCC Number: Search Clear OR Search by Amelogenin (AMEL) + at least 7 loci: Separate each allele entry with a comma (e.g., CSF1PO = 11, 12)
OR	AMEL:
2. Input a profile to run it against the ATCC public database	D5S818:









Export the data to

Excel

1. Search by ATCC Number to Obtain an STR Profile Standard

Example: Find your CCL-2 HeLa cell STR profile at the top of the

page



Disclaimer: Reference to this database and the data contained therein may be cited in publications, and ATCC encourages such citation or reference. While every reasonable effort has been made to assure the accuracy of these data, no warranty, express or implied, is made by ATCC as to their accuracy.

While ATCC has largely used the Promega PowerPlex® 1.2 System in the creation of these data and recommends that researchers wishing to produce data for comparison also use a Promega PowerPlex® System ATCC does not provide a general endorsement of this product or provide any warranty or representation regarding its quality or performance in the scientific community for the identification of human cell lines.

As in the past, when we find a misidentified cell line among our holdings (i.e., the DNA profile is similar or identical to that of an unrelated cell line), we will post a note on the Misidentified Cell Lines page of our website.

Search by ATCC Number:

CCL-2 Search Clear

OR

Search by Amelogenin (AMEL) + at least 7 loci:





to Match Against Others in the Database



Matches >= 80% Matches >= 56% Clear







to Match Against Others in the Database





to Match Against Others in the Database



Results can take 30 seconds +/-

In this case there were no matches below 80% for this profile

Showing	1 - 1 Of 1									P	ageSiz	e: 100 🔻
Add to Cart	%Match	ATCC® Number	Designation	<u>D5S818</u>	<u>D13S317</u>	<u>D7S820</u>	<u>D16S539</u>	<u>vWA</u>	<u>TH01</u>	AMEL	<u>TPOX</u>	CSF1PO
	80	CCL-171	MRC-5	11,12	11,14	10,11	9,11	15	8	X,Y	8	11,12
1								A	dd to C	Cart	Export	to Excel

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As in the past, when we find a misidentified cell line among our holdings (i.e., the DNA profile is similar or identical to that of an unrelated cell line), we will post a note on the Misidentified Cell Lines page of our website.

Search by ATCC Number:



OR

Search by Amelogenin (AMEL) + at least 7 loci:

Separate each allele entry with a comma (e.g., CSF1PO = 11, 12)
AMEL: XY

PIUS	

D5S818: 11,12 D13S317: 11,14 10,11 D7S820: D16S539: 11 vWA: 15 TH01: 8 TPOX: 8 11,12 CSF1PO:



Practice Profile



Search by ATCC Number:

Search	Clear

OR

Search by Amelogenin (AMEL) + at least 7 loci: Separate each allele entry with a comma (e.g., CSF1PO = 11, 12)

In this example you will find a number of results only by selecting >=80%

AMEL: X	•
Plus	
D5S818:	12,13
D13S317:	11,13,14
D7S820:	11,12
D16S539:	12,13
vWA:	15,18
TH01:	6
TPOX:	9,11
CSF1PO:	11

Matches >= 80% Matches >= 56% Clear





to Match Against Others in the Database



Results can take 30 seconds +/-

In this case there were no matches below 80% for this profile

Showing 1	- 3 Of 3									Pa	ageSize	a 100 🗸
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	93.75	CRL-2102	C2BBe1	12,13	11,13,14	11,12	12,13	16,18	6	x	9,11	11
	80	CRL-2868	HCC827	12	9	11,12	12	18	6	x	8	11
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As in the past, when we find a misidentified cell line among our holdings (i.e., the DNA profile is similar or identical to that of an unrelated cell line), we will post a note on the Misidentified Cell Lines page of our website.

Matches >= 80% Matches >= 56% Clear

Search by ATCC Number:

TPOX: CSF1PO: 11

9,11

	Search Clear	
	OR	
Searc Separat	h by Amelogenin (AMEL) + at lea e each allele entry with a comma (e.g., CSF	ast 7 loci: 1PO = 11, 12)
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D13S317:	11.13.14	
D7S820:	11.12	
D16S539:	12.13	
vWA:	15,18	
TH01:	6	



to Match Against Others in the Database



Results can take 30 seconds +/-

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Search by Amelogenin (AMEL) + at least 7 loci: Separate each allele entry with a comma (e.g., CSF1PO = 11, 12)

In this case there were no matches 80% and above, so only the 56% and lower selection provided results.





Conditional Forma

Formatting * as Tab

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9,10

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8 9,11

10

2. Search by STR Profile

to Match Against Others in the Database



12 13

Consider ATCC STR Cell Authentication

