http://www.cstl.nist.gov/biotech/strbase
http://www.dna.gov/research/nist
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STRBase Website Updates

New Resources for the Forensic Genetics Community Available on the NIST STRBase Website

Copenhagen, Denmark August 2007

P-302

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For more than a decade, the U.S. National Institute of Standards and Technology (NIST) has maintained the Short Tandem Repeat DNA Internet DataBase (STRBase), which is located at **http://www.cstl.nist.gov/biotech/strbase/**. The purpose of STRBase has been and continues to be an attempt to bring together the abundant literature and information in the forensic genetics field in a cohesive fashion to make current and future work easier. STRBase recently became NIST Standard Reference Database (SRD) 130. New resources that are regularly added to STRBase can now be found quickly at **http://www.cstl.nist.gov/biotech/strbase/updates.htm**. A page was recently created to track null alleles detected through DNA testing with different primer sets (see **http://www.cstl.nist.gov/biotech/strbase/NullAlleles.htm**). In addition, a new software program enabling concordance checking with multiple data sets can be downloaded from **http://www.cstl.nist.gov/biotech/strbase/software.htm**. Hundreds of new pages of information have been added in the past few years and numerous PowerPoint slides, NIST publications and presentations, software programs, and other useful information is available for download.

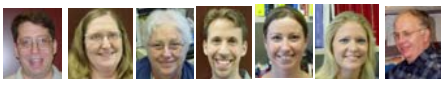
NIJ-Funded Projects at NIST

http://www.cstl.nist.gov/biotech/strbase/NIJprojects.htm

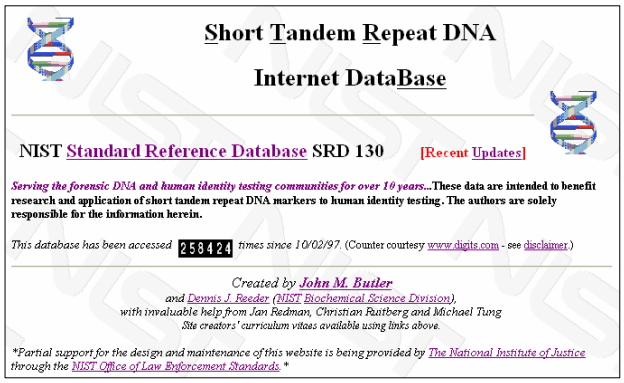
Projects Performed by NIST Human Identity Project Team

ABI 3100 performance with various STR typing systems
ABI 3130xl upgrade evaluation
AutoDimer: software to enable rapid multiplex PCR design
Autosomal SNP loci
Autosomal STR loci: beyond the CODIS markers
Biomatrica dry storage device DNA stability studies
Cat STR assay: development of the "MeowPlex"
DNA quantitation methods: evaluation and comparison
DNA recovery from aged bloodstains on untreated filter paper
DNA recovery from bloodstains on various filter papers
DNA recovery from various tubes
DNA stability studies
Dog STR assay development
Expert Systems: FSS-i3 software evaluation
Genetic variation in U.S. populations
Interlaboratory studies: NIST Mixed Stain Study #1 & #2
Interlaboratory studies: NIST Mixed Stain Study #3
Interlaboratory studies: DNA quantitation (QS04)
Interlaboratory studies: STR mixture interpretation (MIX05)
Literature collection on topics related to forensic DNA typing
Locus-specific brackets (LSBs) for Y-STR typing
Luminex system for Y-SNP typing
Mass spectrometry SNP typing
MiniFiler concordance study
miniSTR assays for recovery of information from degraded DNA
miniSTR: new loci and assays/support to other labs
Mitochondrial DNA: LINEAR ARRAY evaluation
Mitochondrial DNA: coding region SNP assay development
Mitochondrial DNA: Affymetrix MitoChip evaluation
mixSTR: a tool to aid mixture DNA cases
Multiplex PCR assay development (2000-present)
Multiplex_QA: development of data quality assessment software
Nuclear DNA from hair shafts
Quality control methods for PCR primers
SNP typing: ancestry informative marker assays
SNP typing: identification assays
SNP website for possible forensic SNP loci
SRM 2391, 2391a, 2391b: PCR-based DNA Profiling Standard
SRM 2395: Human Y-Chromosome DNA Profiling Standard
SRM 2372: Human DNA Quantitation Standard
STRBase: a human identity testing community resource
STR kit primer sequence analysis
Supplying samples to collaborators and colleagues
Training materials: STR typing using capillary electrophoresis
Training materials: mixture interpretation and LCN DNA testing
Validation resources, standardization, and training
Variant allele sequencing to determine basis for allele dropout
Y-chromosome: Duplication characterization
Y-chromosome: Examination of the DYS464 multi-copy marker
Y-chromosome: Y-SNP variation in U.S. populations
Y-chromosome: Y-STR kit evaluations
Y-chromosome: Y-STR multiplex assay development
Y-chromosome: Y-STR mutation rate determination
Y-chromosome: Y-STR value of additional loci

NIST Human Identity Project Team – Leading the Way in Forensic DNA…



John Butler, Margaret Kline, Jan Redman, Pete Vallone, Becky Hill, Amy Decker, Dave Duewer



Short Tandem Repeat DNA
Internet DataBase

NIST Standard Reference Database SRD 130 [Recent Updates]

*Serving the forensic DNA and human identity testing communities for over 10 years...*These data are intended to benefit research and application of short tandem repeat DNA markers to human identity testing. The authors are solely responsible for the information herein.

This database has been accessed 258424 times since 10/02/97. (Counter courtesy www.digits.com - see disclaimer.)

Created by John M. Butler
and Dennis J. Reeder (NIST Biochemical Science Division),
with invaluable help from Jan Redman, Christian Ruitberg and Michael Tung
Site creators' curriculum vitaes available using links above.

Partial support for the design and maintenance of this website is being provided by The National Institute of Justice through the NIST Office of Law Enforcement Standards.

STRBase contains information on

2912 literature references
364 variant alleles
153 tri-allelic patterns
28 interlaboratory studies
89 NIST publications (since 2000)
250 NIST presentations (since 2000)
342 weblinks
- 45 organizations
- 41 journals
- 18 academic and forensic institutes
- 117 commercial sites
- 21 genetic genealogy labs
- 57 paternity testing labs
- 9 legal sites dealing with forensic DNA
- 34 useful information sites

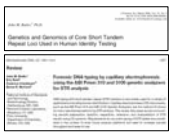
Software Tools Available for Download

http://www.cstl.nist.gov/biotech/strbase/software.htm

OmniPop (from Brian Burritt, SDPD) – enables profile match probability calculations across 202 populations
AutoDimer – aids multiplex assay design
mixSTR – compares reference profiles to mixtures for rapid allele inclusion/exclusion
Multiplex_QA – enables comparison of ABI 310/3100/3130 electropherogram data with quality metrics
STR_ConvertFormats – transforms data from columns into rows
STR_MatchSamples – compares STR types from multiple data sets to aid concordance checking

NIST Publications Available for Download

http://www.cstl.nist.gov/biotech/strbase/NISTpub.htm



Training Materials Available for Download

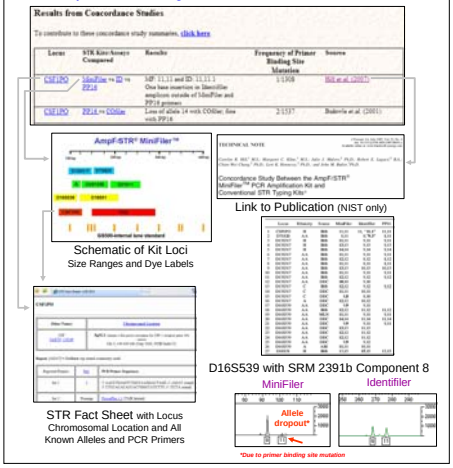
http://www.cstl.nist.gov/biotech/strbase/training.htm

Downloadable PowerPoint files (>800 slides) and pdf presentations covering topics such as CE theory and troubleshooting, low-copy number DNA testing, and Y-chromosome and mtDNA analysis.

New Null Allele Section

for Tracking Discordance Between Primer Sets

http://www.cstl.nist.gov/biotech/strbase/NullAlleles.htm



http://www.cstl.nist.gov/biotech/strbase/

General Information
- **Recent Updates**
- Purpose of STRBase
- Publications and Presentations from NIST Project Team
- NIJ-Funded Projects
- Training Materials
- Links to other web sites
- Glossary of commonly used terms

Forensic STR Information
- STRs101: Brief Introduction to STRs
- ***Core Loci***: FBI CODIS Core STR Loci and European Core Loci
- STR Fact Sheets (observed alleles and PCR product sizes)
- **Multiplex STR kits**
- Sequence Information (annotated)
- Variant Allele Reports
- Tri-Allelic Patterns
- Mutation Rates for Common Loci
- Published PCR primers
- Y-chromosome STRs
- **miniSTRs (short amplicons) – including MiniFiler**
- **Null Alleles - discordance observed between STR kits**
- STR Reference List - ***now >2900 references***

Other DNA Marker Information and Non-Human Resources
- **Amelogenin information**
- Sex-typing markers
- Forensic SNP information
- Mitochondrial DNA (mtDNA)
- Cat STR Information
- Dog STR information

Lab Resources and Tools
- Addresses for scientists working with STRs
- Training Materials
- STR Allele Sequencing
- Population data – ***downloadable OmniPop program***
- Data from NIST U.S. Population Samples
- NIST-Developed Software including mixSTR and Multiplex_QA
- NIST Standard Reference Material for PCR-Based Testing
- New STR Markers under Development at NIST
- Chromosomal Locations
- DNA Advisory Board Quality Assurance Standards
- Interlaboratory Studies
- NIST Mixture 2005 Interlab Study MIX05 Data
- **Validation information**
- DNA Quantitation – including information on SRM 2372
- Technology for resolving STR alleles

Planned Future Additions
- Mixture Interpretation – with worked examples
- Statistical Analysis Resources - with worked examples
- Known STR Flanking Region Variation
- **Slides showing applications for STR typing**

STR Fact Sheets

http://www.cstl.nist.gov/biotech/strbase/str_fact.htm

D16S539 http://www.cstl.nist.gov/biotech/strbase/str_D16S539.htm

Other Names	Chromosomal Location	GenBank Accession
D16 (miniSTR: 4550)	**16q24.1** Chr 16; 84.944 Mb (May 2004, NCBI build 35)	G07925; has 11 repeats AC024291.3; has 11 repeats

Repeat: [GATA] = GenBank top strand

Reported Primers	Ref.	PCR Primer Sequences
Set 1	Promega	PowerPlex 1.1 (PL labeled), PowerPlex 16 (DE labeled) primer sequences 5'-GGGGCTCTAGAGCTGTAAAAAG-3' 5'-[DE]-GTTTGTGTGTGATCTGTAAGCATGTATC-3'
Set 2	CODIS: MapChart	5'-GATCCCAAGCTCTTCTCTT-3' 5'-ACGTTTGTGTGTGCATCTGT-3'
Set 3	ABI	Cofiler (5-FAM labeled), SGM Plus (5-FAM labeled)
Set 4	ABI	Identifiler (VIC labeled with *mobility modifier*)

PCR Product Sizes of Observed Alleles

Allele (Repeat #)	Set 1	Set 2	Set 3	Set 4*	Repeat Structure	Ref.
4	260 bp	129 bp	229 bp	248 bp		variant allele
5	264 bp	133 bp	233 bp	252 bp	$[GATA]_5$	721
6	268 bp	137 bp	237 bp	256 bp		variant allele
7	272 bp	141 bp	241 bp	260 bp		variant allele
8	276 bp	145 bp	245 bp	264 bp	$[GATA]_8$	721
8.3	279 bp	148 bp	248 bp	267 bp		variant allele
9	280 bp	149 bp	249 bp	268 bp	$[GATA]_9$	721
9.3	283 bp	152 bp	252 bp	271 bp		variant allele
10	284 bp	153 bp	253 bp	272 bp	$[GATA]_{10}$	721
11	288 bp	157 bp	257 bp	276 bp	$[GATA]_{11}$	721
11.3	291 bp	160 bp	260 bp	279 bp		variant allele
12	292 bp	161 bp	261 bp	280 bp	$[GATA]_{12}$	721
12.1	293 bp	162 bp	262 bp	281 bp		variant allele
12.2	294 bp	163 bp	263 bp	282 bp		variant allele
13	296 bp	165 bp	265 bp	284 bp	$[GATA]_{13}$	721
13.1	297 bp	166 bp	266 bp	285 bp		variant allele
13.3	299 bp	168 bp	268 bp	287 bp		variant allele
14	300 bp	169 bp	269 bp	288 bp	$[GATA]_{14}$	721
14.3	303 bp	172 bp	272 bp	291 bp		variant allele
15	304 bp	173 bp	273 bp	292 bp	$[GATA]_{15}$	721
16	308 bp	177 bp	277 bp	296 bp		variant allele

Allelic Ladders: Commercially available from Promega and Applied Biosystems
Common Multiplexes: PowerPlex 1.1, PowerPlex 16, CODIS, SGM Plus, Identifiler
Mutation Rate: **0.11%**

RETURN TO STR Fact Sheet Page
RETURN TO HOMEPAGE
Last Updated: 06/26/2007

Index of STR Fact Sheets:

CD4
CSF1PO (US core)
F13A1
F13B
FES/FPS
FGA (FIBRA) (US core)
HPRTB
LPL
Penta D
Penta E
SE33 (German core)
TH01 (US core)
TPOX (US core)
VWA (US core)
D1S1656 (European recommended)
D2S441 (European recommended)
D2S1338 (European locus)
D3S1358 (US core)
D5S818 (US core)
D6S1043
D7S820 (US core)
D8S1179 (US core)
D10S1248 (European recommended)
D12S391 (European recommended)
D13S317 (US core)
D14S1434
D16S539 (US core)
D18S51 (US core)
D19S433 (European locus)
D21S11 (US core)
D22S1045 (European recommended)
DYS19 (European core)
DYS385 a/b (European core)
DYS388
DYS389 I/II (European core)
DYS390 (European core)
DYS391 (European core)
DYS392 (European core)
DYS393 (European core)
DYS434
DYS437
DYS438 (SWGDAM)
DYS439 (SWGDAM)
DYS447
DYS448
DYS456
DYS458
DYS460
DYS464
DYS635
Y-GATA-A4
Y-GATA-A7.1
Y-GATA-A7.2
Y-GATA-A10
Y-GATA-H4

NIST Human Identity Project Team – Leading the Way in Forensic DNA…

NIST publications and presentations: http://www.cstl.nist.gov/biotech/strbase/NISTpub.htm
NIST-developed software: http://www.cstl.nist.gov/biotech/strbase/software.htm
NIST-collected population data: http://www.cstl.nist.gov/biotech/strbase/NISTpop.htm

Funding: Interagency Agreement 2003-IJ-R-029 between the National Institute of Justice and NIST Office of Law Enforcement Standards
Disclaimer: Points of view are those of the authors and do not necessarily represent the official position or policies of the US Department of Justice. Certain commercial equipment, instruments and materials are identified in order to specify experimental procedures as completely as possible. In no case does such identification imply a recommendation or endorsement by the National Institute of Standards and Technology nor does it imply that any of the materials, instruments or equipment identified are necessarily the best available for the purpose.

National Institute of Justice
The Research, Development, and Evaluation Agency of the U.S. Department of Justice

For more information, please contact:
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Poster available for download from STRBase: http://www.cstl.nist.gov/biotech/strbase/pub_pres/Butler_ISFG2007poster.pdf