Package ‘norSTR’

October 24, 2026

Title Forensic STR Map and Allele Frequencies

Version 0.3.1

Description A marker map for 51 forensic short tandem repeat (STR) markers, and allele frequency databases for Norway and several broader regional populations: Europe, Africa, South America, West Asia, Middle Asia, and East Asia. Developed and maintained for use at the Department of Forensic Sciences, Oslo, Norway.

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URL https://github.com/magnusdv/norSTR

BugReports https://github.com/magnusdv/norSTR/issues

Depends R (>= 3.5)

Config/roxygen2/version 8.1.1

Encoding UTF-8

Language en-GB

LazyData true

NeedsCompilation no

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Repository CRAN

Date/Publication 2026-10-24 20:00:02 UTC

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`africaDB` *African STR allele frequency database*

Description

Allele frequencies for 48 forensic STR markers in the African population. These include all markers in map51 except `D3S3045`, `D6S477`, and `D6S1043`.

Usage

```
africaDB
```

Format

A list of 48 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, europeDB, southAmericaDB, westAsiaDB, midAsiaDB, eastAsiaDB

Examples

```
africaDB[1:2]
```

eastAsiaDB — *East Asian STR allele frequency database*

Description

Allele frequencies for 40 forensic STR markers in the East Asian population. These include all markers in map51 except D3S3045, D5S2800, D6S477, D6S1043, D7S3048, D11S2368, D13S325, D15S659, D18S1364, D19S253, and D22GATA198B05.

Usage

```
eastAsiaDB
```

Format

A list of 40 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, europeDB, africaDB, southAmericaDB, westAsiaDB, midAsiaDB

Examples

```
eastAsiaDB[1:2]
```

europeDB — *European STR allele frequency database*

Description

Allele frequencies for 45 forensic STR markers in the European population. These include all markers in map51 except D3S3045, D6S477, D6S1043, D11S554, APOC3, and D17S906.

Usage

```
europeDB
```

Format

A list of 45 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, africaDB, southAmericaDB, westAsiaDB, midAsiaDB, eastAsiaDB

Examples

```
europeDB[1:2]
```

---

legacyAPO — *Use legacy APOC3 marker name*

Description

Replace marker name `APOC3` by the legacy name `APOAI1` in a frequency database.

Usage

```
legacyAPO(db)
```

Arguments

`db`	A frequency database.

Value

The modified database.

---

maps — *Built-in linkage maps*

Description

Genetic maps for the autosomal STR markers featured in **norSTR**.

Usage

```
map51

map50
```

Format

`map51` is a data frame with 51 rows and 4 columns: `Marker`, `Chr`, `Mb`, and `cM`.

`map50` is a data frame with 50 rows and 4 columns: `Marker`, `Chr`, `cM`, and `Kit`.

Details

`map51` is the current map and is recommended for new analyses. It provides both physical and genetic positions for 51 STR markers.

`map50` is a legacy map retained for reproducibility of older analyses. It contains 50 markers and the genetic positions used in earlier versions of **norSTR**.

Compared with `map50`, `map51` has the following changes:

- Added column `Mb` with the physical positions (GRCh38/hg38) of each marker, defined as the midpoint of each STR interval.
- Recalculated all genetic positions (`cM`) with `ibdsim2::convertPos()`, using the deCODE 2019 recombination map (Halldorsson et al., 2019).
- Added marker `D6S1043`.
- Renamed marker `APOAI1` to `APOC3`. (This is an in-house marker not included in current commercial kits. The original name is a historical label and is no longer considered accurate.)
- Removed column `Kit`. Marker subsets corresponding to various commercial kits are available in `markerSets`.

References

Halldorsson et al. (2019). Characterizing mutagenic effects of recombination through a sequence-level genetic map. *Science*, 363, eaau1043. doi:10.1126/science.aau1043

See Also

markerSets

`markerSets` *Common STR marker sets*

Description

Lists of autosomal STR markers included in selected forensic kits and panels. Sex-determining (e.g. Amelogenin) and non-autosomal markers (e.g. Y markers) are explicitly omitted.

Usage

```
markerSets
```

Format

A named list of 7 character vectors of marker names.

Details

Kits included:

- `codis`: Expanded CODIS core loci (FBI/NIST), 21 autosomal STR markers.
- `fusion6c`: PowerPlex® Fusion 6C (Promega), 23 autosomal markers.
- `globalfiler`: GlobalFiler™ PCR Amplification Kit (Applied Biosystems), 21 autosomal markers.
- `hdplex`: HDplex STR Kit (Qiagen), 9 autosomal markers.
- `phoenix`: 3 autosomal markers (D11S554, APOC3, D17S906).
- `sureid`: SureID® 23comp Human STR Identification Kit (Health Gene Technologies), 23 autosomal markers.
- `sureid27`: Combined SureID® 23comp and SureID® PathFinder Plus, 26 autosomal markers.

Examples

```
markerSets$fusion6c
```

`midAsiaDB` *Mid Asian STR allele frequency database*

Description

Allele frequencies for 48 forensic STR markers in the Mid Asian population. These include all markers in map51 except `D3S3045`, `D6S477`, and `D6S1043`.

Usage

```
midAsiaDB
```

Format

A list of 48 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, europeDB, africaDB, southAmericaDB, westAsiaDB, eastAsiaDB

Examples

```
midAsiaDB[1:2]
```

norwayDB — *Norwegian STR allele frequency database*

Description

Allele frequencies for 50 forensic STR markers in the Norwegian population. These include all markers in map51 except D6S1043 (not currently available)

Usage

```
norwayDB
```

Format

A list of 50 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

europeDB, africaDB, southAmericaDB, westAsiaDB, midAsiaDB, eastAsiaDB

Examples

```
norwayDB[1:2]
```

southAmericaDB — *South American STR allele frequency database*

Description

Allele frequencies for 32 forensic STR markers in the South American population. These include all markers in map51 except D3S3045, D5S2800, D6S477, D6S1043, D7S3048, D9S1122, D10S1435, D11S2368, D11S554, APOC3, D13S325, D14S1434, D15S659, D17S906, D17S1301, D18S1364, D19S253, D20S482, and D22GATA198B05.

Usage

```
southAmericaDB
```

Format

A list of 32 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, europeDB, africaDB, westAsiaDB, midAsiaDB, eastAsiaDB

Examples

```
southAmericaDB[1:2]
```

---

westAsiaDB *West Asian STR allele frequency database*

Description

Allele frequencies for 50 forensic STR markers in the West Asian population. These include all markers in map51 except `D6S1043`

Usage

```
westAsiaDB
```

Format

A list of 50 frequency vectors. Each vector is numeric with sum 1, and uses the allele labels as names.

Source

Department of Forensic Sciences, Oslo University Hospital.

See Also

norwayDB, europeDB, africaDB, southAmericaDB, midAsiaDB, eastAsiaDB

Examples

```
westAsiaDB[1:2]
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