

TERMS OF REFERENCES

THE EUROPEAN DNA PROFILING GROUP – EDNAP

Adopted at the EDNAP meeting 29 May 2024 in Copenhagen

History of EDNAP

EDNAP's founding members met on 15/16 October 1988 in Sunbury near London, UK, at a meeting arranged by Peter Martin, the Metropolitan Police Laboratory. Forensic genetic scientists from 11 European countries came together to find a way of harmonizing DNA technology for crime investigation. An integrated Europe with open borders led to an escalation of cross-border crimes and increased demand for exchanging intelligence data among European countries. Data obtained with the new DNA technology could only be exchanged efficiently among laboratories and across borders if the DNA methods used in the European countries were harmonized with common standards.

EDNAP was accepted as a working group of the International Society for Forensic Genetics (ISFG) during the 1991 congress in Mainz, Germany. It was intended that each European country should be represented by one laboratory with sufficient scientific expertise in forensic DNA technology. As a small group, EDNAP could make decisions solely based on scientific considerations and operate in the spirit of helping each other.

EDNAP's main objective was to harmonize DNA typing technology for crime investigations. This has been addressed by organizing collaborative intercomparison exercises and discussing the results at group meetings.

In two initial collaborative exercises, EDNAP addressed the application of single-locus DNA probes. The exercise demonstrated that the results obtained in the participating laboratories were sufficiently close to each other to be used to compare DNA typing results.

In further collaborative exercises, EDNAP evaluated the possibility of standardizing DNA typing of several PCR-amplified STR loci. Later, automated STR typing using fluorescent detection of PCR fragments was tested. This new technique dramatically increased sample throughput and computerized online recording of typing results. The reliability of STR typing was confirmed in a collaborative exercise including EDNAP and non-EDNAP laboratories and led to the selection of the "European standard set of loci" by ENFSI and the European Union. Further exercises have dealt with Y-chromosome STR systems and mitochondrial DNA polymorphism.

Between 1997 and 2000, a network project, Standardization of DNA Profiling in Europe – STADNAP, funded by the European Commission, was carried out. One of STADNAP's achievements was identifying the need for appropriate quality control in mtDNA databasing.

In 1999, the EDNAP Forensic mtDNA Population Database – EMPOP – was established by Walther Parson, Institute of Legal Medicine, Medical University of Innsbruck. New laboratory strategies for fail-safe mtDNA typing and mathematical data analysis models were developed and have been optimized continuously. EMPOP went online in October 2006. EMPOP serves as a repository of high-quality mtDNA data scrutinized

by EMPOP. Furthermore, EMPOP is a research centre with many collaborative research projects and advises other scientists in their mtDNA research.

The collaborative exercises in the last years have included the evaluation of single nucleotide polymorphism (SNP) typing, identification of body fluids in forensic stain samples using mRNA analysis, forensic ancestry analysis by SNP typing, forensic phenotyping of eye colour, and age estimation by measuring DNA methylation of informative CpG DNA nucleotides.

The results of the collaborative exercises have been published in the scientific literature; see Appendix 1.

Since 2004, the EDNAP Group and the DNA Expert Working Group of the European Network of Forensic Science Institutes (ENFSI) have coordinated their annual personal meetings. The ENFSI DNA Expert Working Group members are invited to attend the EDNAP meetings, and the EDNAP members are invited to attend the sessions of the DNA Analysis Methods & Interpretation Group of the ENFSI DNA Expert Working Group.

New Directions for EDNAP

Today, forensic genetic typing methods are well-established and harmonized in Europe and other parts of the World. The EDNAP laboratories perform accredited DNA analyses. Most EDNAP laboratories – but not all – are members of the DNA Expert Working Group of ENFSI, which serves as a platform for practical scientific collaboration among European forensic genetic laboratories. The ENFSI group competently addresses many of the issues initially dealt with by EDNAP. The need for EDNAP's role in harmonizing standard DNA typing methods no longer exists.

EDNAP's role should change into forensic genetic research. However, most of the founding laboratories of EDNAP have limited resources for research. Therefore, EDNAP's future structure must be reconsidered.

EDNAP must have statutes, and the new directions must be formulated, e.g., Terms of References (ToR), which can support the scientific activities of EDNAP as a working group under the International Society for Forensic Genetics.

Terms of Reference (ToR) means 'The purpose and structure of a project, committee, meeting, negotiation, or a similar collection of people who have agreed to work together to accomplish a shared goal.' The ToR of a dynamic group is updated continuously.

Suggestion for EDNAP Terms of Reference

Aims:

EDNAP

1. is a forum for experts to share information, explore new research areas, and drive the development of forensic genetics,
2. organizes collaborative exercises, workshops, in-depth discussions of research results and ideas, presentations, etc.
3. strives to act as an informal scientific environment and create an atmosphere where members help each other with research-related questions.

Members:

EDNAP invites

4. European academic and technical support staff members working scientifically within the field of forensic genetics and who are members of the ISFG to apply for membership in EDNAP and the ISFG,
5. European forensic genetic laboratories with high scientific expertise in forensic DNA technologies to be represented in EDNAP by qualified staff members (ISFG membership required), and
6. Scientific colleagues with particular competencies relating to forensic genetics to participate as guests (non-EDNAP members) in meetings, research projects, collaborative exercises, etc. ISFG membership is not required for guests.

Meeting forms:

EDNAP

7. organizes at least one annual personal scientific meeting. The meeting can take place (but it is not a requirement) in conjunction with the personal meeting of the ENFSI DNA Expert Working Group,
8. can, in exceptional circumstances, organize the annual meeting as an Internet-based meeting,
9. decides on additional personal, Internet-based, or combined meetings,
10. invites guests to participate in EDNAP's meetings and will continue to communicate through the EDNAP part of the ISFG website and explore the necessity of establishing other communicative web-based platforms to exchange information.

Projects:

EDNAP

11. explores new forensic genetic research areas suitable for research projects,
12. forms research groups, including EDNAP and non-EDNAP members,
13. explores the possibilities of obtaining funding, and
14. applies for funding of forensic genetic research projects.

Publication:

15. EDNAP supports the timely publication of results in high-impact journals.

Structure and organization of EDNAP's work:

EDNAP

16. is a working group with its own statutes under the International Society for Forensic Genetics,
17. is organized with an elected board with a Chairman, a Deputy Chairman, a Secretary, and a Treasurer according to EDNAP statutes; the Secretary and the Treasurer can be the same person,
18. coordinates its work with the board of the ISFG and the DNA Expert Working Group of the European Network of Forensic Science Institutes, and
19. has currently no membership fee in addition to the membership fee of the ISFG.

Appendix 1.

EDNAP Publications:

Schneider PM, Fimmers R, Woodroffe S, Werrett DJ, Bär W, Brinkmann B, Eriksen B, Jones S, Kloosterman AD, Mevag B, Pascali VL, Rittner C, Schmitter H, Thomson JA, Gill P. (1991) Report of a European collaborative exercise comparing DNA typing results using a single locus VNTR probe. *Forensic Sci. Int.* 49:1-15

Gill P, Woodroffe S, Bär W, Brinkmann B, Carracedo A, Eriksen B, Jones S, Kloosterman AD, Ludes B, Mevag B, Pascali VL, Rudler M, Schmitter H, Schneider PM, Thomson JA. (1992) A report of an international collaborative experiment to demonstrate the uniformity obtainable using DNA profiling techniques. *Forensic Sci. Int.* 53:29-43

Gill P, Kimpton C, D'Aloja E, Andersen JF, Bär W, Brinkmann B, Holgerssen S, Johnsson V, Kloosterman AD, Lareu MV, Nellesmann L, Pfitzinger H, Phillips CP, Schmitter H, Schneider PM, Stenersen M. (1994) Report of the European DNA profiling group (EDNAP) - towards standardization of short tandem repeat (STR) loci. *Forensic Sci. Intern.* 65:51-59

Kimpton C, Gill P, D'Aloja E, Andersen JF, Bär W, Holgerssen S, Jacobsen S, Johnsson V, Kloosterman AD, Lareu MV, Nellesmann L, Pfitzinger H, Phillips CP, Rand S, Schmitter H, Schneider PM, Stenersen M, Vide MC (1995) Report on the second EDNAP collaborative STR exercise. *Forensic Sci. Int.* 71:137-152

Andersen J, Martin P, Carracedo A, Dobosz M, Eriksen B, Johnsson V, Kimpton C, Kloosterman A, Konialis C, Kratzer A, Phillips P, Mevag B, Pfitzinger H, Rand S, Rosen B, Schmitter H, Schneider P, Vide M. (1996) Report on the third EDNAP collaborative STR exercise. *Forensic Sci. Int.* 78:83-93

Gill P, d'Ajola A, Andersen J, Dupuy B, Jangblad M, Johnsson V, Kloosterman AD, Kratzer A, Lareu MV, Meldegaard M, Philips C, Pfitzinger H, Rand S, Sabatier M, Scheithauer R, Schmitter H, Schneider PM, Vide MC. (1997) Report of the European DNA profiling group (EDNAP): an investigation of the complex STR loci D21S11 and HUMFIBRA (FGA). *Forensic Sci Int* 86:25-33

Gill P, Brinkmann B, d'Ajola E, Andersen J, Bär W, Carracedo A, Dupuy B, Eriksen B, Jangblad a, Johnsson V, Kloosterman AD, Lincoln P, Morling N, Rand S, Sabatier M, Scheithauer R, Schneider PM, Vide MC. (1997) Considerations from the European DNA profiling group (EDNAP) concerning STR nomenclature. *Forensic Sci Int.* 87:185-192

Carracedo A, d'Aloja E, Dupuy B, Jangblad A, Karjalainen M, Lambert C, Parson W, Pfeiffer H, Pfitzinger H, Sabatier M, Syndercombe-Court D, Vide C. (1998) Reproducibility of mtDNA analysis between laboratories: a report of the European DNA Profiling group (EDNAP). *Forensic Sci. Int.* 97:155-164

Gill P, d'Aloja E, Dupuy B, Eriksen B, Jangblad A, Johnsson V, Kloosterman AD, Lareu MV, Mevag B, Morling N, Phillips C, Pfitzinger H, Rand S, Sabatier M, Scheithauer R, Schmitter H, Schneider PM, Skita I, Vide MC. (1998) Report of the European DNA Profiling group (EDNAP) - an investigation of the hypervariable loci ACTBP2, APOA11 and D11S554 and the compound loci D12S391 and D1S1656. *Forensic Sci. Int.* 98:193-200

Schneider PM, d'Aloja E, Dupuy BM, Eriksen B, Jangblad A, Kloosterman AD, Kratzer A, Lareu MV, Pfitzinger H, Rand S, Scheithauer R, Schmitter H, Skitsa I, Syndercombe-Court D, Vide MC (1999) Results of a collaborative study regarding the standardization of the Y-linked STR system DYS385 by the European DNA Profiling (EDNAP) group. *Forensic Sci. Int.* 102:159-165

Carracedo A, Beckmann A, Bengs A, Brinkmann B, Caglia A, Capelli C, Gill P, Gusmao L, Hagelberg C, Hohoff C, Hoste B, Kihlgren A, Kloosterman A, Myhre Dupuy B, Morling N, O'Donnell G, Parson W, Phillips C, Pouwels M, Scheithauer R, Schmitter H, Schneider PM, Schumm J, Skitsa I, Stradmann-Bellinghausen B, Stuart M, Syndercombe Court D, Vide C (2001) Results of a collaborative study of the EDNAP group regarding the reproducibility and robustness of the Y-chromosome STRs DYS19, DYS389 I and II, DYS390 and DYS393 in a PCR pentaplex format. *Forensic Sci. Int.* 119:28-41

Tully G, Bär W, Brinkmann B, Carracedo A, Gill P, Morling N, Parson W, Schneider PM (2001) Considerations by the European DNA profiling (EDNAP) group on the working practices, nomenclature and interpretation of mitochondrial DNA profiles. *Forensic Sci. Int.* 124:83-91

Schneider PM, Bender K, Mayr WR, Parson W, Hoste B, Decorte R, Cordonnier J, Vanek D, Morling M, Karjalainen M, Carlotti CMP, Sabatier M, Hohoff C, Schmitter H, Pflug W, Wenzel R, Patzelt D, Lessig R, Dobrowolski P, O'Donnell G, Garafano L, Dobosz M, de Knijff P, Mevag B, Pawlowski R, Gusmao L, Vide MC, Alonso A, Garcia Fernandez O, Pilar Sanz N, Kihlgreen A, Baer W, Meier V, Teyssier A, Coquoz R, Brandt C, Germann U, Gill P, Hallett J, Greenhalgh M (2004) STR analysis of artificially degraded DNA: Results of a collaborative European exercise. *Forensic Sci. Int.* 139:123-134

Parson W, Brandstätter A, Alonso A, Brandt N, Brinkmann B, Carracedo A, Corach D, Froment O, Furach I, Grzybowski T, Hedberg K, Keyser-Tracqui C, Kupiec T, Lutz-Bonengel S, Mevag B, Ploski R, Schmitter H, Schneider PM, Syndercombe-Court D, Sörensen E, Thew H, Tully G, Scheithauer R (2004) The EDNAP mitochondrial DNA population database (EMPOP) collaborative exercises: organisation, results and perspectives. *Forensic Sci. Int.* 139:215-226

Tully G, Barritt SM, Bender K, Brignon E, Capelli C, Dimo-Simonin N, Eichmann C, Ernst CM, Lambert C, Lareu MV, Ludes B, Mevag B, Parson W, Pfeiffer H, Salas A, Schneider PM, Staalstrom E (2004) Results of a collaborative study of the EDNAP group regarding mitochondrial DNA heteroplasmy and segregation in hair shafts. *Forensic Sci. Int.* 140:1-11

Brion M, Dupuy BM, Heinrich M, Hohoff C, Hoste B, Ludes B, Mevag B, Morling N, Niederstatter H, Parson W, Sanchez J, Bender K, Siebert N, Thacker C, Vide C, Carracedo A (2005) A collaborative study of the EDNAP group regarding Y-chromosome binary polymorphism analysis. *Forensic Sci. Int.* 153:103-108

Dixon LA, Dobbins AE, Pulker HK, Butler JM, Vallone PM, Coble MD, Parson W, Berger B, Grubwieser P, Mogensen HS, Morling N, Nielsen K, Sanchez JJ, Petkovski E, Carracedo A, Sanchez-Diz P, Ramos-Luis E, Brion M, Irwin JA, Just RS, Loreille O, Parsons TJ, Syndercombe-Court D, Schmitter H, Stradmann-Bellinghausen B, Bender K, Gill P (2006) Analysis of artificially degraded DNA using STRs and SNPs -- results of a collaborative European (EDNAP) exercise. *Forensic Sci. Int.* 164:33-44

Gill P, Fereday L, Morling N, Schneider PM (2006) The evolution of DNA databases -- recommendations for new European STR loci. *Forensic Sci. Int.* 156:242-244.

Gill P, Fereday L, Morling N, Schneider PM (2006) New multiplexes for Europe -- amendments and clarification of strategic development. *Forensic Sci. Int.* 163:155-157

Parson W, Fendt L, Ballard D, Børsting C, Brinkmann B, Carracedo A, Carvalho M, Coble MD, Corte Real F, Desmyter S, Dupuy BM, Harrison C, Hohoff C, Just R, Krämer T, Morling N, Salas A, Schmitter H, Schneider PM, Sonntag ML, Vallone PM, Brandstätter A (2008) Identification of West Eurasian mitochondrial haplogroups by mtDNA SNP screening: Results of the 2006–2007 EDNAP collaborative exercise. *Forensic Sci. Int. Genet.* 2:61-68. <http://dx.doi.org/10.1016/j.fsigen.2007.08.007>

Sanchez JJ, Børsting C, Balogh K, Berger B, Bogus M, Butler JM, Carracedo A, Syndercombe Court D, Dixon LA, Filipovic B, Fondevila M, Gill P, Harrison CD, Hohoff C, Huel R, Ludes B, Parson W, Parsons TJ, Petkovski E, Phillips C, Schmitter H, Schneider PM, Vallone PM, Morling N (2008) Forensic typing of autosomal SNPs with a 29 SNP-multiplex — Results of a collaborative EDNAP exercise. *Forensic Sci. Int. Genet.* 2:176-183. <http://dx.doi.org/10.1016/j.fsigen.2007.12.002>

Haas C, Hanson E, Bär W, Banemann R, Bento AM, Berti A, Borges E, Bouakaze C, Carracedo A, Carvalho M, Choma A, Dotsch M, Duriancikova M, Hoff-Olsen P, Hohoff C, Johansen P, Lindenbergh PA, Loddenkötter B, Ludes B, Maronas O, Morling N, Niederstätter H, Parson W, Patel G, Popielarz C, Salata E, Schneider PM, Sijen T, Sviezena B, Zatkalikova L, Ballantyne J (2011) mRNA profiling for the identification of blood — Results of a collaborative EDNAP exercise, *Forensic Sci. Int. Genet.* 5:21-26, <http://dx.doi.org/10.1016/j.fsigen.2010.01.003>

Welch L, Gill P, Tucker VC, Schneider PM, Parson W, Smidt Mogensen H, Morling N (2011) A comparison of mini-STRs versus standard STRs — Results of a collaborative European (EDNAP) exercise. *Forensic Sci. Int. Genet.* 5:257-258. <http://dx.doi.org/10.1016/j.fsigen.2010.01.004>

Tomas C, Axler-DiPerte G, Budimlija ZM, Borsting C, Coble MD, Decker AE, Eisenberg A, Fang R, Fondevila M, Frisk Fredslund S, Gonzalez S, Hansen AJ, Hoff-Olsen P, Haas C, Kohler P, Kriegel AK, Lindblom B, Manohar F, Maronas O, Mogensen HS, Neureuther K, Nilsson H, Scheible MK, Schneider PM, Sonntag ML, Stangegaard M, Syndercombe-Court D, Thacker CR, Vallone PM, Westen AA, Morling N (2011) Autosomal SNP typing of forensic samples with the GenPlex(TM) HID System: Results of a collaborative study. *Forensic Sci. Int. Genet.* 5:369-375, <http://dx.doi.org/10.1016/j.fsigen.2010.06.007>

Haas C, Hanson E, Anjos MJ, Bär W, Banemann R, Berti A, Borges E, Bouakaze C, Carracedo A, Carvalho M, Castella V, Choma A, De Cock G, Dotsch M, Hoff-Olsen P, Johansen P, Kohlmeier F, Lindenbergh PA, Ludes B, Maronas O, Moore D, Morerod ML, Morling N, Niederstätter H, Noel F, Parson W, Patel G, Popielarz C, Salata E, Schneider PM, Sijen T, Sviezena B, Turanska M, Zatkalikova L, Ballantyne J (2012) RNA/DNA co-analysis from blood stains — Results of a second collaborative EDNAP exercise, *Forensic Sci. Int. Genet.* 6:70-80. <http://dx.doi.org/10.1016/j.fsigen.2011.02.004>

Haas C, Hanson E, Anjos MJ, Banemann R, Berti A, Borges E, Carracedo A, Carvalho M, Courts C, De Cock G, Dötsch M, Flynn S, Gomes I, Hollard C, Hjort B, Hoff-Olsen P, Hříbiková K, Lindenbergh A, Ludes B, Maroñas O, McCallum N, Moore D, Morling N, Niederstätter H, Noel F, Parson W, Popielarz C, Rapone C, Roeder AD, Ruiz Y, Sauer E, Schneider PM, Sijen T, Court DS, Sviežená B, Turanská M, Vidaki A, Zatkálíková L, Ballantyne J (2013) RNA/DNA co-analysis from human saliva and semen stains—results of a third collaborative EDNAP exercise. *Forensic Sci Int Genet.* 7:230-239. <http://dx.doi.org/10.1016/j.fsigen.2012.10.011>

Haas C, Hanson E, Anjos MJ, Ballantyne KN, Banemann R, Bhoelai B, Borges E, Carvalho M, Courts C, De Cock G, Drobnic K, Dötsch M, Fleming R, Franchi C, Gomes I, Hadzic G, Harbison SA, Hartevelde J, Hjort B, Hollard C, Hoff-Olsen P, Hüls C, Keyser C, Maroñas O, McCallum N, Moore D, Morling N, Niederstätter H, Noël F, Parson W, Phillips C, Popielarz C, Roeder AD, Salvaderi L, Sauer E, Schneider PM, Shanthan G, Syndercombe Court D, Turanská M, van Oorschot RAH, Vennemann M, Vidaki A, Zatkálíková L, Ballantyne J (2014) RNA/DNA co-analysis from human menstrual blood and vaginal secretion stains: Results of a fourth and fifth collaborative EDNAP exercise, *Forensic Sci Int Genet* 8:203-212. <http://dx.doi.org/10.1016/j.fsigen.2013.09.009>

Haas C, Hanson E, Banemann R, Bento AM, Berti AM, Carracedo A, Courts C, De Cock G, Drobnic K, Fleming R, Franchi C, Gomes I, Hadzic G, Harbison SA, Hjort B, Hollard C, Hoff-Olsen P, Keyser M, Kondili A, Maronas O, McCallum N, Miniati P, Morling N, Niederstätter H, Noel F, Parson W, Porto MJ, Roeder AD, Sauer E,

Schneider PM, Shantan G, Sijen T, Syndercombe Court D, Turanska M, van den Berge M, Vennemann M, Vidaki A, Zatkalikova L, Ballantyne J (2015) RNA/DNA co-analysis from human skin and contact traces - results of a sixth collaborative EDNAP exercise, *Forensic Sci Int Genet* 16: 139-47.
<http://dx.doi.org/10.1016/j.fsigen.2014.11.014>

Chaitanya L, Walsh S, Andersen JD, Ansell R, Ballantyne K, Ballard D, Banemann R, Bauer CM, Bento AM, Brisighelli F, Capal T, Clarisse L, Groß T, Haas C, Hoff-Olsen P, Hollard C, Keyser C, Kiesler CM, Kohler P, Linacre A, Minawi A, Morling N, Nilsson H, Norén L, Ottens R, Parson W, Pascali VL, Phillips C, Porto MJ, Sajantila A, Schneider P, Sijen T, Söchtig J, Syndercombe-Court D, Tilmar A, Turanska M, Vallone PM, Zatkalíková L, Zidkova A, Branicki W and Kayser M. Collaborative EDNAP Exercise on the IrisPlex system for DNA based prediction of human eye colour. *Forensic Sci Int Genet* 2014; 11: 241-51.
<http://dx.doi.org/10.1016/j.fsigen.2014.04.006>

Santos C, Fondevila M, Ballard D, Baneman R, Bentod AM, Børsting C, Branicki W, Brisighelli F, Burrington M, Capal T, Chaitanya N, Daniel R, Decroyer V, England R, Gettings KB, Gross TE, Haas C, Hartevelde PJ, Hoff-Olsen P, Hoffmann A, Kayseri M, Linacre A, Kohler P, Mayr-Eduardoffu M, McGovern C, Morling N, Noel F, O'Donnell G, Parson W, Pascali VL, Porto MJ, Roset A, Schneider PM, Sijen T, Sten V, Syndercombe Court D, Templeton J, Turanska M, Vallone PM, van Oorschot PAV, Zatkalikova L, The EUROFORGEN-NoE Consortium, Carracedo A, Phillips C. Forensic ancestry analysis with two simple capillary electrophoresis AIMs panels: Results of a collaborative EDNAP exercise. *Forensic Sci Int Genet* 2015; 19: 56-67.
<http://dx.doi.org/10.1016/j.fsigen.2015.06.004>

Weiler NE, Baca K, Ballard D, Balsa F, Bogus M, Børsting C, Brisighelli F, Cervenáková J, Chaitanya L, Coble M, Decroyer V, Desmyter S, van der Gaag KJ, Gettings K, Haas C, Heinrich J, João Porto M, Kal AJ, Kayser M, Kúdelová A, Morling N, Mosquera-Miguel A, Noel F, Parson W, Pereira V, Phillips C, Schneider PM, Syndercombe Court D, Turanska M, Vidaki A, Wolinski P, Zatkalíková L, Sijen T. A collaborative EDNAP exercise on SNaPshot™-based mtDNA control region typing. *Forensic Sci Int Genet* 2017; 26: 77-84.
<http://dx.doi.org/10.1016/j.fsigen.2016.10.014>

Ingold S, Dørum G, Hanson E, Berti A, Branicki W, Brito P, Elsmore P, Gettings KB, Giangasparo F, Gross TE, Hansen S, Hanssen EN, Kampmann ML, Kayser M, Laurent FX, Morling N, Mosquera-Miguel A, Parson W, Phillips C, Porto MJ, Pospiech E, Roeder AD, Schneider PM, Schulze Johann K, Steffen CR, Syndercombe-Court D, Trautmann M, van den Berge M, van der Gaag KJ, Vannier J, Verdoliva V, Vidaki A, Xavier C, Ballantyne J, Haas C. Body fluid identification using a targeted mRNA massively parallel sequencing approach - results of a EUROFORGEN/EDNAP collaborative exercise. *Forensic Sci Int Genet*. 2018; 34:105-115.
<http://dx.doi.org/10.1016/j.fsigen.2018.01.002>

Ingold S, Dørum G, Hanson E, Ballard D, Berti A, Gettings KB, Giangasparo F, Kampmann ML, Laurent FX, Morling N, Parson W, Steffen CR, Ulus A, van den Berge M, van der Gaag KJ, Verdoliva V, Xavier C, Ballantyne J, Haas C. Body fluid identification and assignment to donors using a targeted mRNA massively parallel sequencing approach - results of a second EUROFORGEN / EDNAP collaborative exercise. *Forensic Sci Int Genet*. 2020; 45:102208. <http://dx.doi.org/10.1016/j.fsigen.2019.102208>