

III Module

Low Template DNA Challenges & Complex Mixture interpretations

Is a 2 week academic summer programme plus the first 3 days of the following week to offer discussion on the mainly advanced topics to help participants become aware of how genetics has changed over the years and the effects that this has had on forensic investigation.







Specific topics will highlight also at how future advances in forensic genetics might affect future criminals investigations will be held by **Peter M. Schneider**, Professor in Forensic Molecular Genetics, Institute of Legal Medicine at University of Cologne (Germany); Coordinator of the EUROFORGEN-NoE Consortium, and Chairman of the German Stain Commission.

The development of ancestry-informative markers (SNPs) and on insertion-deletion (InDel) markers and the forensic DNA phenotyping and DNA prediction for investigative purpose will be also held by Dr. **Christofer Phillips**, full-time researcher in the Forensic Genetics Unit, University of Santiago de Compostela (Spain) and by **Manfred Kayser**, Professor of Forensic Molecular Biology at the Erasmus MC University Medical Center Rotterdam (Netherland).

Y Chromosome genetics and its forensic applications, will be held by **Lutz Roewer**, Professor for Forensic Genetic at the Institute of Legal Medicine, Humboldt-University Berlin (Germany). He is currently curator of the Y Chromosome Haplotype Reference Database (YHRD) and member of the SWGDAM Y-STR committee.

In addition, a Practical Course Laboratory will give the opportunity for participants to manipulate evidence from closed case works.

During the first week academic summer programme lectures and news from the Company sponsors.

III - Module - Low Template DNA Challenges & Complex Mixture interpretations							
20 - 25 July 2015 Week V							
Week 20 - 25 July	Mon. 20	Tues. 21	Wed. 22	Thu. 23	Fri. 24	Sat. 25	San. 26
9.00 - 10.30	Welcome & participant registration	Next-Generation Sequencing for Forensics ⁴ 	Presumptive tests of forensic strains: From proteins to DNA to RNA ⁸	Validation and Thresholds: Strengths and limitations of methods ¹¹	Perspectives and future directions of forensic DNA analysis ¹⁴	Open Seminars ¹⁷	Free Day
10.45 - 13.15	Course presentations ¹	Forensic Genomics: mtDNA Analysis to Identify Missing Persons ⁵ 	Challenges of Low Template DNA : limits of sensitivity and the risk of indirect DNA transfer in casework ⁹	Complex Mixtures: Basic and advanced interpretation methods ¹²	Forensic analysis and inference of ancestry ¹⁵		
13.30 -14.30	Lunch provided by CERISDI						
14.30 -15.30	Human ID & Forensics ² 	Overview on the Forensic Genetic Workflow ⁶ 	SNP basics and use of SNPs for identification of degraded DNA ¹⁰	SNP analysis with NGS systems and accessing current online human variant data ¹³	Open Seminars ¹⁶	Free Afternoon	
15.45 - 17.15	Forensic Genetic & Technologies ³ 	Molecular Forensics ⁷ 					
					Dinner Talk with Speakers		

1 - Course presentations:

Elena Carra, Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy: Introduction to DNA mixture interpretations

Vincenzo Cavalieri, Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy: What is Epigenetics?

Paola Di Simone, Ph.D. - Director Forensic Genetics Laboratory, Department of the Minister of Interior, Scientific Police Laboratory Palermo, Italy: Introduction on Internal Validation Guide of Autosomal STR Systems for Forensic Laboratories

Salvatore Feo - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy: General Introduction to Next Generation Sequencing

III - Module - Low Template DNA Challenges & Complex Mixture interpretations

27 July - 5 August 2015
Week VI + 3 days

Week 27 July - 5 August	Mon. 27	Tues. 28	Wed. 29	Thu. 30	Fri. 31	Sat. 1	San. 2	Mon. 3	Tues. 4	Wed. 5
9.00 - 10.30	Genetics of sudden cardiac death ¹⁸	Forensic DNA Phenotyping: Appearance DNA prediction for investigative purposes ²¹	Post-mortem DNA damage & Forensic Genetics ²⁴	Paternity and relationship test: Strategies in relationship testing ²⁷	Expert Reports and Testimony ³⁰	Opens Seminars ³³		Forensic applications of X and Y chromosome markers: an overview ³⁴	Y Chromosomal STRs: forensic practice ^{1,38}	X-chromosomal STRs: forensic practice ³⁹
10.45 - 13.15	Touch DNA a quarter of a century after the fact: a mafia casework ¹⁹	Molecular alibi testing: Estimating the deposition time of forensic stains ²²	Epigenetics & Forensic Science ²⁵	Optimized workflow for sexual assault cases ²⁸	Next-generation Y-STR analysis ³¹			Sex identification ³⁵		
13.30 - 14.30	<i>Lunch provided by CERISDI</i>						<i>Lunch provided by CERISDI</i>			
15.45 - 17.15	Touch DNA a quarter of a century after the fact: a mafia casework ²⁰	<i>Practical Course</i> : Forensic Biology Laboratory ²³	<i>Practical Course</i> : Trace evidence analysis Laboratory ²⁶	<i>Practical Course</i> - Forensic Molecular Biology Laboratory ²⁹	Open Seminars ³²			Statistics of haploid markers ³⁶	Y Chromosomal STRs: forensic practice ^{2,39}	TEST
								Role of population genetics for an empirically grounded forensic identification science ³⁷	Human phylogeny and biogeographical ancestry prediction ⁴⁰	
					Dinner Talk with Speakers					Certificate Ceremony & Farewell Dinner

Courses/Module/ Speakers:
2, 7 - QIAGEN , Forensic news from the Company
3, 4 - LIFE TECHNOLOGIES , Forensic news from the Company
5 - ILLUMINA , Forensic news from the Company
6 - PROMEGA , Forensic news from the Company
8, 9, 11, 12, 14 - Prof. Peter M. Schneider , Ph.D. - Institute of Legal Medicine, University of Cologne, Germany
10,13, 15 - Dr. Christofer Phillips - Forensic Genetics Unit, University of Santiago de Compostela, Spain
25 - Prof. Vincenzo Cavalieri , Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy
16, 17, 19, 20 - Prof. Elena Carra , Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy; Dr. Paola Di Simone , Ph.D. - Director Forensic Genetics Laboratory, Department of the Minister of Interior, Scientific Police Palermo, Italy; Prof. Silvano Presciuttini - Department of Translational Research and New Technologies in Medicine, University of Pisa, Italy
18 - Prof. Salvatore Feo , - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy; Prof. Antonina Argo , M.D. - Department of Sciences for the Promotion of Health G. D'Alessandro, University of Palermo, Italy
21, 22 - Prof. Manfred Kayser , Ph.D. - Department of Forensic Molecular Biology, Erasmus MC University Medical Center, Rotterdam, Netherlands
23, 26, 29 - Prof. Elena Carra , Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy; Prof. Vincenzo Cavalieri , Ph.D. - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies STEBICEF - University of Palermo, Italy
24, 27, 28, 30, 32- Prof. Adriano Tagliabracci , M.D. - Department of Biomedical Sciences and Public Health, University of Ancona, Italy
28, 31, 36, 37, 40 - Prof. Lutz Roewer , Ph.D. - Institute of Legal Medicine, Humboldt-University Berlin, Germany
32, 34, 35, 38, 39 - Prof. Carlo Robino , M.D. - Department of Public Health Sciences and Pediatrics, University of Turin, Italy
33 - Dr. Adriano Sofri - Intellectual, Journalist and Writer, Pisa Italy

III – Module-
The Weight of Evidence : Bioethics & DNA , Biostatistics & DNA profiles
20 July – 5 August 2015
Week V

Monday 20 July

9.00 – 9.30	Registration
10.00 – 10.30	Opening addresses E. Carra (Palermo - I), P. Di Simone (Palermo - I)
10.30 – 11.00	<i>Coffee Break</i> Course Presentation
11.00 – 11.30	An Introduction to mixture interpretations E. Carra (Palermo - I)
11.30 – 12.00	Introduction on internal Validation Guide of Autosomal STR Systems for Forensic Laboratories; P. Di Simone (Palermo - I)
12.00 – 12.30	General Introduction to Next Generation Sequencing S. Feo (Palermo - I)
12.30 – 13.00	What is Epigenetics? V. Cavalieri (Palermo - I)
13.30 – 14.30	<i>Lunch</i>
15.00 – 16.30	Human ID & Forensics QIAGEN
16.30 – 16.45	<i>Break</i>
16.45 – 17.30	Forensic Genetic & Technologies LIFE TECHNOLOGIES

Tuesday 21 July

9.00 – 10.30	Next-generation Sequencing for Forensics LIFE TECHNOLOGIES
10.30 – 11.00	<i>Coffee Break</i>
11.00 – 13.15	Forensic Genomics : mtDNA Analysis to Identify Missing Persons ILLUMINA
13.30 – 14.30	<i>Lunch</i>
15.30 – 16.30	Overview on the Forensic Genetic Workflow PROMEGA
16.30 – 16.45	<i>Break</i>
16.45 – 17.30	Molecular Forensics QIAGEN

Wednesday 22 July

9.00 – 10.30	Presumptive test of forensic strains: From proteins to DNA to RNA P. Schneider (Köln - D)
10.30 – 11.00	<i>Coffee Break</i>
11.00 – 13.15	Challenges of Low Template DNA: limits of sensitivity and risk of indirect DNA transfer in casework P. Schneider (Köln - D)
13.30 – 14.30	<i>Lunch</i>
15.30 – 16.30	SNP basis and use of SNPs for identification of degraded DNA-1

Christopher Phillips (Santiago de Compostela - E)

16.30 – 16.45

Break

16.45 – 17.00

SNP basis and use of SNPs for identification of degraded DNA-2

Christopher Phillips (Santiago de Compostela - E)

Thursday 23 July

9.00 – 10.30

Validation and Thresholds: Strengths and limitations of methods

P. Schneider (Köln - D)

10.30 – 11.00

Coffee Break

11.00 – 13.00

Complex Mixtures: Basic and advanced interpretation methods

P. Schneider (Köln - D)

13.30 – 14.30

Lunch

15.00 – 16.30

SNP analysis with NGS systems and accessing current online human variant data-1

Christopher Phillips (Santiago de Compostela - E)

16.30 – 16.45

Break

16.45 – 17.00

SNP analysis with NGS systems and accessing current online human variant data-2

Christopher Phillips (Santiago de Compostela - E)

Friday 24 July

9.00 – 10.30

Perspectives and future directions of forensic DNA analysis

P. Schneider (Köln - D)

10.30 – 11.00

Coffee Break

11.00 – 13.00

Forensic analysis and inference of ancestry

Christopher Phillips (Santiago de Compostela - E)

13.30 – 14.30

Lunch

Open Seminars for Officers of the Italian Court and criminal justice professionals

15.30 – 16.30

Case report: touch DNA a quarter of a century after the fact-1

E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)

16.30 – 16.45

Break

16.45 – 17.30

Case report: touch DNA a quarter of a century after the fact-1

E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)

Dinner Talk with Speakers

Saturday 25 July

Open Seminars for Officers of the Italian Court and criminal justice professionals

9.00 – 10.30

Case report: touch DNA a quarter of a century after the fact -2

E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)

S. Presciuttini (Pisa - I)

10.30 – 11.00

Break

11.00 – 13.00

Case report: touch DNA a quarter of a century after the fact -2

E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)

S. Presciuttini (Pisa - I)

Light Buffet Lunch

Free afternoon

Sunday 26 July Free day

**III - Module-
Week VI + 3 days**

Monday 27 July

- 9.00 – 10.30 Genetic of sudden cardiac death
S. Feo (Palermo - I), **A. Argo** (Palermo - I)
- 10.30 – 11.00 *Coffee Break*
- 11.00 – 13.15 Touch DNA a quarter of a century after the fact: a mafia casework
E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)
- 13.30 – 14.30 *Lunch*
- 15.00 – 16.30 Case report: touch DNA a quarter of a century after the fact -2
E. Carra (Palermo - I), **P. Di Simone** (Palermo - I)
S. Presciuttini (Pisa - I)
- 16.30 – 16.45 *Break*
- 16.45 – 17.30 Case report: touch DNA a quarter of a century after the fact -2
E. Carra (Palermo - I), **P. Di Simone** (Palermo - I) **S. Presciuttini** (Pisa - I)

Tuesday 28 July

- 9.00 – 10.30 Forensic DNA Phenotyping: Appearance DNA prediction for investigative purposes
M. Kayser (Rotterdam - NL)
- 10.30 – 11.00 *Coffee Break*
- 11.00 – 13.00 Molecular alibi testing: Estimating the deposition time of forensic stains
M. Kayser (Rotterdam - NL)
- 13.30 – 14.30 *Lunch*
- Transfer at University of Palermo to STEBICEF Department by shuttle bus*
- 15.30 – 17.30 **Practical Course:** Forensic Biology Laboratory
E. Carra (Palermo - I), **V. Cavalieri** (Palermo - I)

Wednesday 29 July

- 9.00 – 10.30 Post-mortem DNA damage & Forensic Genetics-1
A. Tagliabracci (Ancona - I)
- 10.30 – 11.00 *Coffee Break*
- 11.00 – 12.00 Post-mortem DNA damage & Forensic Genetics-2
A. Tagliabracci (Ancona - I)
- 12.00 – 13.00 Epigenetics & Forensic Science
V. Cavalieri (Palermo - I)
- 13.30 – 14.30 *Lunch*
- Transfer at University of Palermo to STEBICEF Department by shuttle bus*
- 15.30 – 17.30 **Practical Course:** Trace evidence analysis Laboratory
E. Carra (Palermo - I), **V. Cavalieri** (Palermo - I)

Thursday 30 July

- 9.00 – 10.30 Paternity and relationship test: Strategies in relationship testing
A. Tagliabracci (Ancona - I)
- 10.30 – 11.00 *Coffee Break*
- 11.00 – 13.15 Optimized workflow for sexual assault cases
L. Roewer (Berlin - D)
- 13.30 – 14.30 *Lunch*
- Transfer at University of Palermo to STEBICEF Department by shuttle bus*
- 15.30 – 17.30 **Practical Course:** Forensic Molecular Biology Laboratory

E. Carra (Palermo - I), **V. Cavalieri** (Palermo - I)

Friday 31 July

- 9.00 – 10.30 Expert Reports and Testimony
A. Tagliabracci (Ancona - I)
10.30 – 11.00 *Coffee Break*
10.45 – 13.15 Next-generation Y-STR analysis
L. Roewer (Berlin - D)
13.30 – 14.30 *Lunch*

Open Seminars for Officers of the Italian Court and criminal justice professionals

- 15.00 – 16.30 Strengths, Limitations and Pitfalls of the DNA analysis
A. Tagliabracci (Ancona - I)
16.30 – 16.45 *Break*
16.45 – 18.00 *Free Topic & Discussion*
C. Robino (Torino - I)

Dinner Talk with Speakers

Saturday 1 August

Open Seminars for Officers of the Italian Court and criminal justice professionals

- 9.00 – 10.30 *“Reagi Mauro Rostagno sorridendo” – A. Sofri, Sellerio, Publisher*
A. Sofri (Pisa - I)
10.30 – 10.45 *Break*
10.45 – 13.00 *Free Topic & Discussion*
A. Sofri (Pisa - I)

Sunday 26 July Free day

Monday 3 August

- 9.00 – 10.30 Forensic applications of X and Y chromosome markers: an overview
C. Robino (Torino - I)
10.30 – 11.00 *Coffee Break*
10.45 – 13.15 Sex identification
C. Robino (Torino - I)
13.30 – 14.30 *Lunch*
15.00 – 16.30 Statistics of haploid markers
L. Roewer (Berlin - D)
16.30 – 16.45 *Break*
16.45 – 17.30 Role of population genetics for an empirically grounded forensic identification science
L. Roewer (Berlin - D)

Tuesday 4 August

- 9.00 – 10.30 Y Chromosomal STRs: forensic practice-1
C. Robino (Torino - I)
10.30 – 11.00 *Coffee Break*
11.00 – 13.00 Y Chromosomal STRs: forensic practice-2
C. Robino (Torino - I)
13.30 – 14.30 *Lunch*
15.30 – 16.30 Y Chromosomal STRs: forensic practice-3
C. Robino (Torino - I)
16.30 – 16.45 *Break*
16.45 – 17.30 Human phylogeny and biogeographical ancestry prediction
L. Roewer (Berlin - D)

Wednesday 5 August

9.00 – 10.30 X-chromosomal STRs: forensic practice-1

C. Robino (Torino - I)

10.30 – 11.00 *Coffee Break*

11.00 – 12.00 X-chromosomal STRs: forensic practice-2

C. Robino (Torino - I)

Free Time

13.30 – 14.30 *Lunch*

15.00 – 17.00 **TEST**

20.00 – 23.00 **Certificate Ceremony & Farewell Dinner**