

**IFCC  
EMD (Education and Management Division)**

**C-CMBC Committee**  
(Committee on Clinical Molecular Biology Curriculum)

**C-CMBC, 6 Days Beginners' Course in  
Molecular Diagnostics**

Evi S. Lianidou, PhD  
Professor of Analytical Chemistry – Clinical Chemistry,  
University of Athens, Greece  
[lianidou@chem.uoa.gr](mailto:lianidou@chem.uoa.gr)



International Federation of Clinical Chemistry and Laboratory Medicine  
C-MBC Clinical Molecular Biology Curriculum (EMD Division)

**C-CMBC activities have started in 2003**



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## C-CMBC activities have started in 2003

### Learning basics in highly sophisticated laboratory surroundings

*“When we got home, we were lost, because we did not have the sophisticated instrumentation and could not benefit fully from the things learned....”*

### Assessing the own accomplishments

*„When we produced results, we never were confident about their quality and validity. So we did not dare to communicate our findings.....“*



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## C-CMBC Committee Structure (2009-2013)

- Michael NEUMAIER, MD, PhD, Professor, University of Heidelberg, Mannheim, Germany (Chair)
- Evi LIANIDOU, PhD, Professor of Analytical Chemistry – Clinical Chemistry, University of Athens, Greece
- Andrea Ferreira-Gonzalez, PhD, Professor of Pathology and Director Molecular Diagnostics Laboratory, VCUHS, Richmond, USA
- Kenji IZUHARA, M.D., Ph.D, Professor, Division of Medical Biochemistry Department of Biomolecular Sciences, Saga Medical School, Nabeshima, Saga, Japan
- Parviz AHMAD-NEJAD, MD, PhD, HELIOS Klinikum Wuppertal, Witten/Herdecke University, Head - Institute for Med. Laboratory Diagnostics, Germany



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## C-MBC Committee Members 2014-2016

### C-CMBC Committee Members

#### Membership

Name	Position	Country	Term	Time in Office
E. Lianidou	Chair	GR	1st	2014 01 - 2016 12
A. Ferreira Gonzalez	Member	US	2nd	2014 01 - 2016 12
V. Haselmann	Member	DE	1st	2014 01 - 2016 12
A. Watanabe	Member	JP	1st	2014 06 - 2016 12

- Evi LIANIDOU, PhD, Professor of Analytical Chemistry – Clinical Chemistry, University of Athens, Greece (Chair)
- Andrea Ferreira-Gonzalez, PhD, Professor of Pathology and Director Molecular Diagnostics Laboratory, VCUHS, Richmond, USA
- Verena HASELMANN, MD, Department: Institute for Clinical Chemistry, University Medicine Mannheim, Medical Faculty Mannheim of the University of Heidelberg, Germany
- Parviz AHMAD-NEJAD, MD, PhD, HELIOS Klinikum Wuppertal, Witten/Herdecke University, Head - Institute for Med. Laboratory Diagnostics, Germany



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## C-MBC Committee Members 2017-2020

### C-CMBC Committee Members

#### Membership

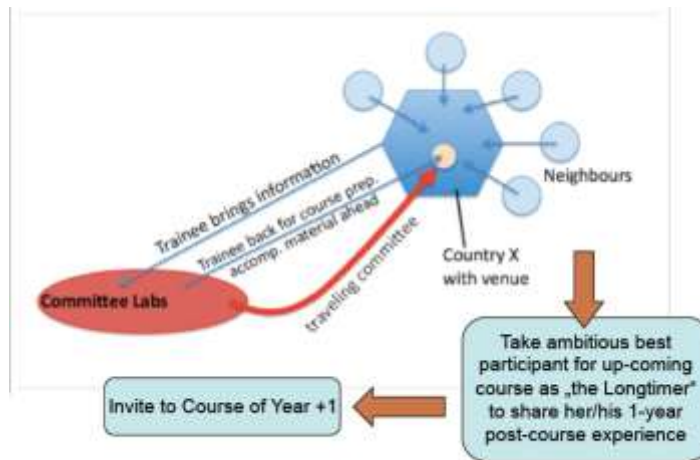
Name	Position	Country	Term	Time in Office
E. Lianidou	Chair	GR	2nd	2017 01 - 2019 12
E. Capoluongo	Member	IT	1st	2017 01 - 2019 12
V. Haselmann	Member	DE	2nd	2017 01 - 2019 12
A. Ferreira Gonzalez	Consultant	US		

- Evi LIANIDOU, PhD, Professor of Analytical Chemistry – Clinical Chemistry, University of Athens, Greece (Chair)
- Andrea Ferreira-Gonzalez, PhD, Professor of Pathology and Director Molecular Diagnostics Laboratory, VCUHS, Richmond, USA
- Verena HASELMANN, MD, Department: Institute for Clinical Chemistry, University Medicine Mannheim, Medical Faculty Mannheim of the University of Heidelberg, Germany
- Ettore Capoluongo, Professor of Clinical Biochemistry and Clinical Molecular at Catholic University of Rome, Head of Department of Laboratory Medicine and Molecular Genetics at Research Hospital IDI, Rome, Italy



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## Concept and structure of the course



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## Main aims of this course

- to bring the diagnostic techniques to the trainee country
- Teaching in their real laboratory environment helps to set up labs more easily
- Teach more people simultaneously; support local collaborations
- Aim for sustainability of teaching effort



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**C-CMBC COURSE  
PRIMARY OBJECTIVES  
SIMPLICITY – ROBUSTNESS - SUSTAINABILITY**

- Learn to design Assays for genetic Conditions.
- Set up and optimize a genetic Assay
  - using basic Components
  - not kit Systems.
- Run a genetic Test and interpret the Results.
- Assess Specificity.
- Assess Quality.
  - Concept of internal QC
  - Concept of external QA



**main Goal: improve Proficiency in visited Areas  
"It's all about Skills"**



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**SECONDARY OBJECTIVES**

Improve confidence to make the correct professional assessments.

- **Embed new labs into an international quality assurance structure.**
- Obtaining feed-back from this course for future events.
- **Teach the teachers.**
- Further improve the "lab-in-a-suitcase" concept.



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## DETAILED ASPECTS OF COURSE

- **Lab-in-a-suitcase**
  - Instruments (PCR cycler, centrifuges, electrophoresis etc.)
  - Pipettors
  - Consumables
  - etc.
- 5 Groups for practical work (à 4 participants)
- **Teaching materials after the Course (on CD)**
  - Tutorial Movies
  - Protocols
  - Literature (.pdf)
- Participants receive 2 years free admission to the molecular EQA schemes of the German Society for Clinical Chemistry & Laboratory Medicine

([www.dgkl.de](http://www.dgkl.de))



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## Activities of the C-MBC committee

- Training Courses in basic laboratory methods in “Molecular Diagnostics”
  - **preanalytical aspects** (e.g. for biomaterial resource establishment)
    - make use of international experiences
  - basic molecular laboratory techniques (**genotyping, basic RNA work**)
  - data interpretation (EQA experiences)
  - **data navigation** (EQA experiences)
- Accompanying lectures on different topics
  - Human and Molecular Genetics
  - Infectious Diseases
  - Predisposition and Diagnostics of malignant Diseases
  - **Pharmacogenetics**
  - Development and Limits of molecular diagnostic Strategies
  - New technological developments

Aim is to bring the diagnostic techniques to the trainee country.  
Teaching in their real laboratory environment helps to set up labs more easily.  
Teach more people simultaneously; support local collaborations.  
→ Aim for sustainability of teaching effort.



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## Activities 2009 - 2018

- 1<sup>st</sup> Course in Damascus, Syria (2009)
- 2<sup>nd</sup> Course in Monte-Video Uruguay (D2010)
- 3<sup>rd</sup> Course in Guatemala City, Guatemala, (2011)
- 4<sup>th</sup> Course in Kuala Lumpur, Malaysia, (2012)
- 5<sup>th</sup> Course in South Africa (2013)
- 6<sup>th</sup> Course in the Philippines (2014)
- 7<sup>th</sup> Course in Lithuania (July 2015)
- 8<sup>th</sup> Course, Tirgu Mures, Romania (2016)
- 9<sup>th</sup> Course, Martin, Slovakia (2018)



**IFCC**  
Beginner's Course  
In Molecular Diagnostics  
Committee-Clinical Molecular Biology Curriculum  
Division

Center of Medical Genetics, Montevideo U.S.  
Uruguay, 10-12 July 2010

The C-MBC of the International Federation of Clinical Chemistry and Laboratory Medicine is a guide to Biological Molecular Diagnostics in the basic techniques and concepts of designing, setting up, performing and evaluating molecular genetic tests (MGT), their evaluation in the laboratory and quality requirements. The course comprises lectures, lab work and seminars (workshops) in 10 days.

**COURSE PROGRAMME**

**July 10, 2010 - Day 1**  
08:00-09:00: Welcome to IFCC  
09:00-10:00: The curriculum and introductory practice  
10:00-11:00: Determination of health insurance by genotyping test: Diabetes

**July 11, 2010 - Day 2**  
08:00-09:00: Introduction to Molecular Diagnostics: basic concepts and laboratory techniques of DNA  
09:00-10:00: DNA analysis: sequencing, genotyping, RFLP and others  
10:00-11:00: Laboratory applications to PCR (DNA genotyping, SNP, HLA typing, HIV, Lyme disease, meningitis and other PCR diagnosis, genotyping, RFLP, etc.)

**July 12, 2010 - Day 3**  
08:00-09:00: General PCR: theory and practical techniques  
09:00-10:00: PCR: nested PCR, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Evaluation of quantitative PCR: accuracy, precision, sensitivity, specificity, linearity, range, and stability

**July 13, 2010 - Day 4**  
08:00-09:00: Basics of PCR and applications  
09:00-10:00: PCR: nested PCR, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Similar with seminar on next address: lecture on Genetic Testing and Biotechnology

**July 14, 2010 - Day 5**  
08:00-09:00: Topics: lecture on quality assurance methods  
09:00-10:00: Laboratory accreditation systems: ISO 15189 and ISO 9001  
10:00-11:00: Laboratory accreditation systems: ISO 15189 and ISO 9001

**July 15, 2010 - Day 6**  
08:00-09:00: Introduction to next course topic  
09:00-10:00: Lab 1: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Lab 2: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR

**July 16, 2010 - Day 7**  
08:00-09:00: Introduction to next course topic  
09:00-10:00: Lab 3: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Lab 4: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR

**July 17, 2010 - Day 8**  
08:00-09:00: Introduction to next course topic  
09:00-10:00: Lab 5: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Lab 6: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR

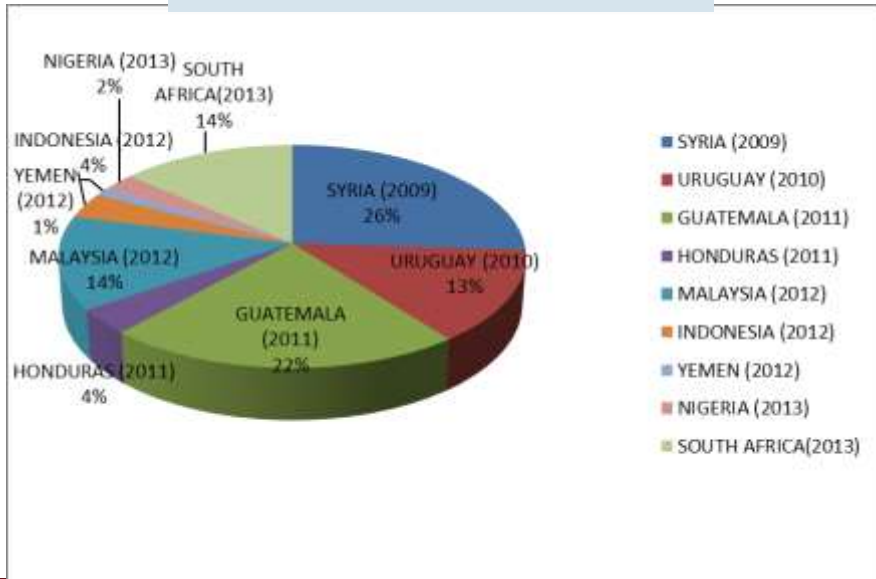
**July 18, 2010 - Day 9**  
08:00-09:00: Introduction to next course topic  
09:00-10:00: Lab 7: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Lab 8: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR

**July 19, 2010 - Day 10**  
08:00-09:00: Introduction to next course topic  
09:00-10:00: Lab 9: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR  
10:00-11:00: Lab 10: PCR, sequencing, genotyping, multiplex PCR, real-time PCR, digital PCR, high-throughput PCR, multiplex PCR

**Logos:** BIO-RAD, Roche, Abbott, BD

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## Participants 2009 - 2013



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## Lab - in - a – Suitcase Sponsors

- BioRad: 1 MyCycler
- Roche: Reagents, Consumables, LightCycler 2.0
- Eppendorf: 3 sets of adjustable Pipettes, Microfuge
- (BD: preanalytical tube systems)
- Lesser-Loewe Foundation: Suitcase
- DGKL: free access to EQA (2-3 year period)



## Local Trainee

- The local trainee, is selected by the National Host Society,
- The local trainee, is trained before the course for 1 week by Dr. Verena Hasselmann in the Institute for Clinical Chemistry, University Medicine Mannheim, Medical Faculty Mannheim of the University of Heidelberg, Germany
- The local trainee returns in the host country and prepares the course



## GENERAL STRUCTURE OF THE PROGRAM

### Lectures

- Morning lectures on “the program of the day”
- Diagnostic fields of application
- Seminars
  - Presentation today’s workshop issues
  - Technical seminar following “hands-on” bench work
  - “pre-flight” seminar for next day (for preparation, optional)
- Labwork
  - Technical equipment introduction
  - Nucleic acids work
  - Assay runs
  - Specificity assessment
  - Assay design and trouble shooting



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## Outline of the Course

**Day 1: isolation of genomic DNA from peripheral blood**

**Day 2: DNA quantitation, agarose gel electrophoresis, set up HPV PCR, in-silico training**

**Day 3: PCR reactions, specific amplification protocols, in-silico training**

**Day 4: RFLP assays, in silico training for real time PCR**

**Day 5: Real time PCR, High Resolution Melting Analysis (HRMA)**

**Day 6: Exams!! State of the art lectures, certificates**



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## Preparation of buffers and solutions



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## Collection of peripheral blood



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isolation of genomic DNA from peripheral blood



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isolation of genomic DNA from peripheral blood



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## Preparation of PCR reaction



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## Preparation of PCR reaction



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## PCR sample loading on a gel



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## PCR sample loading on a gel



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***In silico* design of a PCR reaction for SNP detection**



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***In silico* design of a PCR reaction for SNP detection**



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### Day 5: real time PCR



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### Seminar room, lecture time



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**Final day, written exams**



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**Final day, receiving the IFCC certificate!!!**



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2nd Course, URUGUAY

**FINAL TEST**

- A final test consisting of 21 multiple choice questions (18 English; 3 Spanish) was carried out in the afternoon of day 5.
- The suggestion came from Dr. Esperon.
- The questions related to the contents of the lectures given to the participants.

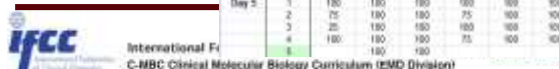
Q#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Score
1	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	87
2	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	61
3	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
4	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	30
5	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	83
6	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	61
7	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	33
8	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
9	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
10	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	33
11	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
12	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	33
13	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
14	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
15	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	33
16	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
17	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
18	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	33
19	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
20	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
21	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	97
% TOTAL	73	82	73	87	88	78	82	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87



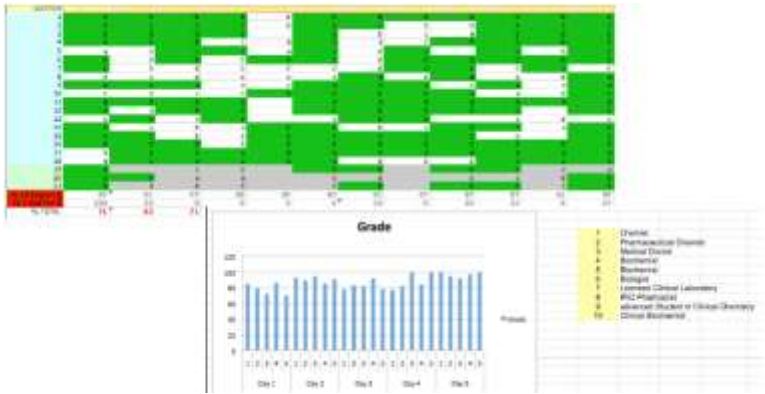
**Critique of 2nd Course URUGUAY**



Day	Profession	1	2	3	4	5	6	7	8	9	10
Day 1	1	75	180	180	180	180	180	180	180	180	180
	2	75	180	180	180	180	180	180	180	180	180
	3	180	180	180	180	180	180	180	180	180	180
	4	75	75	75	75	75	75	75	75	75	75
Day 2	1	75	180	180	180	180	180	180	180	180	180
	2	50	180	180	75	180	180	180	180	75	180
	3	180	180	75	180	180	180	75	180	180	180
	4	75	75	75	75	180	180	75	180	75	180
Day 3	1	75	180	75	180	180	180	180	75	180	180
	2	75	180	75	75	180	180	180	180	180	75
	3	180	180	75	180	180	180	75	180	180	180
	4	75	180	75	75	180	180	180	75	180	180
Day 4	1	180	180	75	180	180	180	180	180	180	180
	2	180	180	180	75	180	180	180	180	180	75
	3	180	180	25	180	180	180	180	180	180	180
	4	75	180	180	75	180	180	180	180	180	75
Day 5	1	180	180	180	180	180	180	180	180	180	180
	2	75	180	180	75	180	180	180	180	180	180
	3	25	180	180	180	180	180	180	180	180	180
	4	180	180	180	75	180	180	180	180	180	180

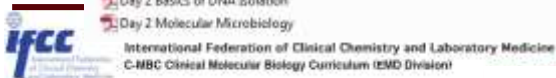


Participants' evaluation is important



4<sup>th</sup> Course, Malaysia –Educational CD contents

- CD Malaysia
- C-CMBC and - the Gang
  - Lab Results
  - Protocols and Solutions**
  - related Papers
  - Tutorial Movies
  - 1-C-CMBC Poster Kuala Lumpur 2012
  - 2-General information Malaysia
  - 3-IFCC,C-CMBC Committee Guatemala
  - 4-Participants e mail adresses
  - 5-COURSE PROGRAMME Malaysia
  - 5-COURSE PROGRAMME Malaysia
  - 6-IFCC\_2011\_RfB
  - Day 0 Basics lecture
  - Day 0 Lecture PCR, PCR optimization
  - Day 0 PCR and RT-PCR
  - Day 0 RealTimePCRlecture
  - Day 0 Sequencing
  - Day 1 Introduction Course Issues
  - Day 1 Presentation Karin Richter
  - Day 1 Systematics of MGT & QA
  - Day 1 Use of Molecular genetic Testing
  - Day 2 Basics of DNA Isolation
  - Day 2 Molecular Microbiology
  - Day 3 Molecular Diagnostics of genetic Disorders
  - Day 4 Introduction to specific detection methods
  - Day 4 Molecular Oncology A Introduction
  - Day 4 Molecular Oncology B Molecular Targets-Comparison Diagnostics
  - Day 4 Molecular/Virology
  - Day 5 in silico Training
  - Day 5 Pharmacogenomics
  - Day 5 State-of-the-Art Microarrays
  - Day 5 State-of-the-Art Sequencing
  - Glossary



## IFCC Junior member:

- The best student by the end of the course is invited to join the committee on next year's course as a guest of C-CMBC.
- In addition, these students are official junior C-CMBC members for a running period of three years by appointment of the IFCC.
- In their term, they keep contact with their fellow junior members, attend IFCC general conferences as invited C-CMBC members, establish/join young scientist networks and try to foster molecular diagnostics in their countries supported by their national societies.
- The expenses are generously being covered by the IFCC and supplemented by their societies in form of bursaries or additional support.



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## IFCC Junior members

With this strategy, we hope to achieve several things for engaged young scientists and laboratory professionals like:

- opportunities to meet with their peers in the committee and in IFCC in general
- visibility for their societies, which are interested in having young enthusiastic scientists in an IFCC committee.
- entry point to be engaged in national activities to promote molecular diagnostics and the respective programs.
- staying active members in the C-CMBC will enable junior members to better network with their fellow colleagues, making contacts, learn from each other's experiences and promote education in molecular diagnostics.
- eventually, new regular members of the C-CMBC could be recruited from the junior members, in case that these members will further get involved in relative activities in their countries or at an international level.



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## IFCC Junior members

Junior member: C-CMBC Course 2010 - Montevideo, Uruguay



B.C.(Clinical Biochemist)  
**Maria Eugenia Schroeder**

**Present position:**  
Assistant Researcher-Master fellow-Laboratory of  
Immunoregulation and Inflammation-Institut Pasteur de Montevideo

email: [meschroeder@pasteur.edu.uy](mailto:meschroeder@pasteur.edu.uy)  
[mariaeugenciaschroeder@gmail.com](mailto:mariaeugenciaschroeder@gmail.com)

Junior member: C-CMBC Course 2011 - Guatemala City, Guatemala



**Karin Richter**

**Present position:**  
Professional Technician at the National Institute of Forensic Sciences -  
INACIF, Guatemala.

email: [knicoller@hotmail.com](mailto:knicoller@hotmail.com)



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## IFCC Junior members

C-CMBC Course, 2013, Cape Town, South Africa



Madelein Hoffman,  
Department of Chemical Pathology  
National Health Laboratory Service  
Tygerberg Hospital Laboratories  
Cape Town  
South Africa

C-CMBC Course, 2014, Manila, The Philippines



Vincent Thomas Alferos,  
Faculty Member, University Santos Thomas,  
Faculty of Pharmacy,  
Manila, The Philippines



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## IFCC Junior members

### C-CMBC Course, 2015, Vilnius, Lithuania



- Liucija Bikauskaitė
- Medical geneticist
- Centre for Medical Genetics, Vilnius University Hospital Santariškių Klinikos
- Vilnius, Lithuania
- E. mail: liucija.bikauskaite@mf.vu.lt

### C-CMBC Course, 2016, Tirgu Mures, Romania



- Kovacs Zsolt
- Present position: Associate lecturer - University of Medicine and Pharmacy, Tirgu Mures, (Romania)
- E. mail: kovacs.zsolt@umftgm.ro



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### C-CMBC Course, 2018, Martin, Slovakia



- Michal Cibulka, MD
- Present position: PhD student at the Department of Medical Biochemistry, Jessenius Faculty of Medicine, Martin



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**EUROMedlab 2015, Paris, June 2015**



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**EUROMedlab, Athens, June 2017**



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1<sup>st</sup> Course in Damascus, Syria  
(December 2009)



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2<sup>nd</sup> Course

Monte-Video Uruguay (December 2010)



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3<sup>rd</sup> Course,  
Guatemala City, Guatemala, (December 2011)



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4<sup>th</sup> Course  
Kuala Lumpur, Malaysia, (November 2012)



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5<sup>th</sup> Course

Cape Town, South Africa (July 2013)



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## 6<sup>th</sup> Course Manila, The Philippines (December 2014)



Local supporting team :

Dr. ROMEO JOSEPH IGNACIO,  
President,

THE PHILIPPINE ASSOCIATION OF  
MEDICAL TECHNOLOGISTS, INC.  
(PAMET)

Trainee: Dr Leila Florento, (former  
President)



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## 7<sup>th</sup> Course Vilnius, Lithuania (July 2015)



Local supporting team : Assoc. Prof. Dalius Vitkus, PhD, President of the Lithuanian Society of Laboratory Medicine, Trainee: Dr Dovile Karciauskaite



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## 8<sup>th</sup> Course Tirgu Mures, Romania (December 2016)



Local supporting team :

Prof. Minodora Dobreanu, MD, PhD, vice-president of the Romanian Association of Laboratory Medicine and Head of the CCAMF (Advanced Medico-Pharmaceutical Research Center of University of Medicine and Pharmacy Tirgu Mures)

Prof. Claudia Banescu, MD, PhD (Head of Molecular Biology Laboratory, CCAMF)

Trainee: Dr. Valeriu Moldovan



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## 9<sup>th</sup> Course Martin, Slovakia (February 2018)



Local supporting team :

**Prof. Oliver Rác**  
(Department of Physiological Pathology, Košice), President of the Slovak Society of Clinical Biochemistry (SSKB)

**Prof. Erika Halašová**  
(Division of Molecular Medicine, Biomed, Martin),

**Prof. Dušan Dobrota**  
(Department of Medical Biochemistry, Martin)

Trainee: **Dr. Katarína Baluchová**  
(Division of Oncology, Biomed, Martin).



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## General Information about the Course:



Special report

Advancing the education in molecular diagnostics: The IFCC-Initiative  
"Clinical Molecular Biology Curriculum" (C-CMBC);  
A ten-year experience



Evi Lianidou<sup>a</sup>, Parviz Ahmad-Nejad<sup>b</sup>, Andrea Ferreira-Gonzalez<sup>c</sup>, Kenji Izuhara<sup>d</sup>, Laura Cremonesi<sup>e</sup>,  
Maria-Eugenia Schroeder<sup>f,1</sup>, Karin Richter<sup>g,1</sup>, Maurizio Ferrari<sup>h</sup>, Michael Neumaier<sup>h,4</sup>

<sup>a</sup> Department of Chemistry, University of Athens, Athens 15701, Greece

<sup>b</sup> Institute for Clinical Chemistry and Microbiology, HELIOS Klinikum Wuppertal, Wuppertal University, 42083 Wuppertal, Germany

<sup>c</sup> Division of Molecular Diagnostics, Department of Pathology, Virginia Commonwealth University, Richmond, VA 23298-0248, USA

<sup>d</sup> Department of Biomedical Sciences, Saga Medical School, Nishimita, Saga, Japan

<sup>e</sup> San Raffaele Scientific Institute, Genome Unit for the Diagnosis of Human Pathologies, Università Vita-Salute San Raffaele, Milan, Italy

<sup>f</sup> Institute Pasteur de Bratislava, Bratislava, Slovakia

<sup>g</sup> National Institute of Forensic Sciences, Guatemala City, Guatemala

<sup>h</sup> Institute for Clinical Chemistry, Medical Faculty Mannheim of the University of Heidelberg, 68107 Mannheim, Germany



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## Website

<http://www.ifcc.org/ifcc-education-division/emd-committees/c-cmbc/>



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### Education and Management

#### EMD Committees

EMD Working Groups and Special Projects

Visiting Lecturer Programme (VLP)

### Committee on Clinical Molecular Biology Curriculum (C-CMBC)

1. C-CMBC Committee Members
2. C-CMBC Course Outline
3. C-CMBC Course 2015-2019
4. C-CMBC Course Tutors
5. C-CMBC Literature
6. C-CMBC Lab in a Suitcase Sponsors



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## IFCC NEWS

News from the World of the International Federation of Clinical Chemistry and Laboratory Medicine  
Visit [www.ifcc.org](http://www.ifcc.org) for more information

### IFCC Beginner's Course in Molecular Diagnostics Held in Manila, Philippines

The IFCC Beginner's Course in Molecular Diagnostics is an initiative that is offered by the IFCC Clinical Molecular Biology Curriculum (C-CMBC) to all national societies. The intense 6 day course teaches from the very basics to advanced molecular biology and is based on the idea that everything needed to perform basic Molecular Biology can fit into a suitcase and therefore would make it fairly inexpensive to perform Molecular Diagnostics all over the world. With the recent introduction of the IFCC junior member initiative, it also provides an opportunity for one member from each country visited to travel to the next, and help out in the practical sessions, network and gain some invaluable experience. In this way this course brings people from different countries together allowing them to experience each other's customs, make friends and network.

Preparation for this year's 6th Molecular Biology course started in May 2014, with announcements being sent to representatives of all IFCC member societies asking to express their interest in the course. Eight countries responded and expressed their interest in hosting the C-CMBC course. Applicants were then asked to attend the IFCC World Congress in Istanbul in June 2014 and to meet with the C-CMBC

by 19 participants of heterogeneous professional backgrounds in molecular biology diagnostic skills ranging from 'no idea' to 'some DNA sequencing experience'. The first day was dedicated to pre-course lectures, given by Dr. Andrea Ferreira-Gonzalez, to bring everyone to the same level. On the first day it was announced that one participant would be chosen as an IFCC junior member based on his/her performance during all these days as well as on the results of the final written evaluation exam. Every morning thereafter started with an introductory lecture for the day's practical and ended off with informative and educational lectures from the C-CMBC tutors. Students randomly divided themselves into 5 groups for the practical sessions and followed a detailed practical manual provided by C-CMBC and printed by IFCC. All participants were enthusiastic about the materials, subject to practice and refinement of skills.



Photo: C-CMBC Course Tutors (from left to right: Dr. Parviz Afshar-Najad, Dr. Atsushi Watanabe, Dr. Evi Lianrika, Dr. Wenke Haselmann, and Dr. Andrea Ferreira-Gonzalez).

The course lectures, practical videos, results from each practical session and photographs that were taken during the course. Thereafter, goodbyes were said with everyone going their separate ways and back to their respective countries.



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## How to apply

### NATIONAL SOCIETY LOCAL REQUIREMENTS

- Announcement of the course
- Accommodation and food
- Registration
- Registration fees
- Local Trainee
- Technical requirements
- Lab in a suitcase

### IFCC SUPPORT

- Travel expenses
- Local Trainee
- IFCC Junior member
- Documentation



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## How to apply

### APPLICATION FORM

Please send back this form to [ifcc@ifcc.org](mailto:ifcc@ifcc.org), [evilianidou@gmail.com](mailto:evilianidou@gmail.com)

Among all requests, only one application will be selected per year

IFCC full member Society: \_\_\_\_\_

National Representative: \_\_\_\_\_

Suggested year/ month/dates for the Course: \_\_\_\_\_

*(To ensure smooth organisation for the course dates must be agreed at least five months in advance.)*

**Duration:** 6 full days

**Language:** The official language will be English.

Date: \_\_\_\_\_ Signature: \_\_\_\_\_



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## Acknowledgements / A

- IFCC:
- EMD Chairs Dr. Janet Smith, Dr. Leslie Lai
- IFCC Presidents: Dr. Graham Beastall, Dr. Maurizio Ferrari, Dr. Howard Morris
- Prof. M. Neumaier, now EFLM President
- All sponsors that have donated the instruments, consumables and reagents used in the course: BioRad Roche Eppendorf the Lesser-Loewe Foundation for advancing Clinical Chemistry, Mannheim (Suitcase) and the German Society of Clinical Chemistry and Laboratory Medicine (DGKL)



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- All C-CMBC Course Tutors and Consultants:  
Dr. Andrea Ferreira Gonzales (USA), Dr. Verena Haselmann (Germany), Dr. Parviz Ahmad-Nejad (Germany), Dr. Ettore Capoluongo (Italy) , Dr. Kenji Izuhara (Japan), Atsushi Watanabe (Japan)
- Local Organizing Committees
- All Trainees, all Participants
- All our Junior Members



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