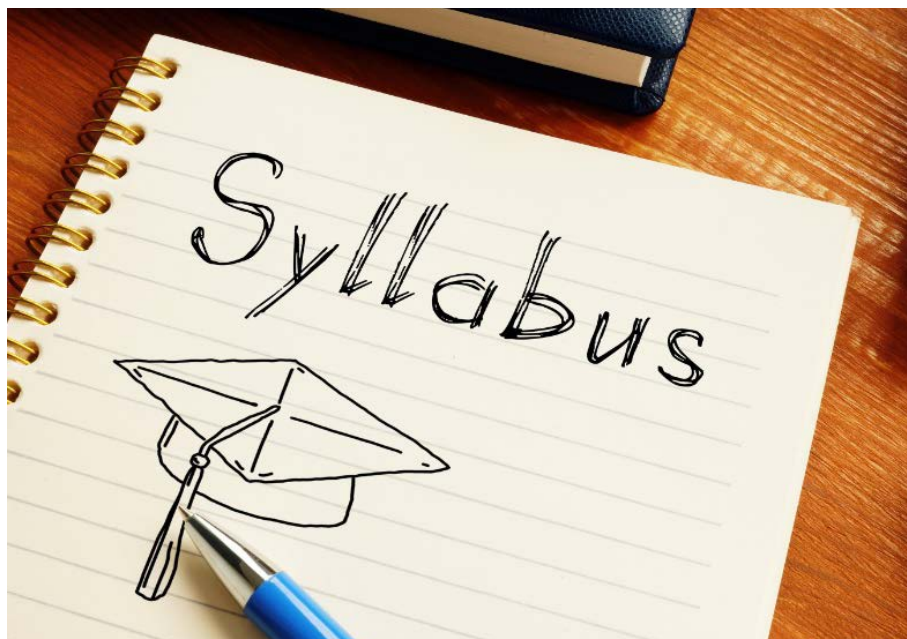


# EFLM SYLLABUS COURSE



EUROPEAN FEDERATION OF CLINICAL CHEMISTRY  
AND LABORATORY MEDICINE



Available from: January 2022  
Free course for EFLM Academy members

A top quality Revision Course  
designed by EFLM  
to increase the knowledge  
and exam confidence for  
postgraduate students

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# WELCOME MESSAGE

Dear colleagues, it is my great pleasure and honor to introduce the “EFLM Syllabus course” to you.

The course is a major EFLM educational resource designed to support the postgraduate education in clinical chemistry and laboratory medicine. I truly believe that this course is of great importance for the entire EFLM community.

On behalf of EFLM I wish to express my gratitude to all who have contributed to it. First and foremost, I wish to thank to the course coordinators for joining me in this project and helping me to shape the course outline, define the course modules, their structure and topics, as well as for recruiting course speakers. You have done an amazing job!

I also wish to thank to the course speakers for their valuable contribution. By sharing their knowledge and through delivering their amazing lectures, they have all helped building a monumental educational resource which will serve generations of students and young colleagues around Europe, in forthcoming years. It was an immense privilege to have the opportunity to collaborate on this course with so many esteemed experts in the field, well-known university professors, outstanding and inspiring colleagues, chairs, and members of many EFLM working groups and other EFLM functional units. Huge thanks to all of them.

The design and delivery of the course has been demanding, given the size of the project and a huge number of involved coordinators and speakers. My special thanks therefore go to Snežana Jovičić who has, in her capacity of the Course Secretary, been a helping hand. Without her I would have not been able to manage it. Finally, I wish to thank to Snežana Jovičić and Lejla Alić for their operational and technical support in collecting and preparing materials for this brochure.

This project will always be a memorable experience for me. The course is truly a golden mine of knowledge and information. I encourage you all to enjoy while discovering it, piece-by-piece.

Sincerely yours,

Ana-Maria Šimundić

EFLM Task group for Syllabus course (TG-ESC), chair

EFLM President (2020-2021)



# ABOUT EFLM SYLLABUS COURSE

EFLM Syllabus course is designed and produced by the members of the EFLM Task group for Syllabus course (TG-ESC), to support the harmonization of postgraduate education of specialists in laboratory medicine in Europe. The course provides a series of highly educational lectures covering practical advices and useful tools for how to master a certain skill. Scope of the course corresponds to the European Syllabus (1), the key document for EFLM which represents the basis for the Common Training Framework for non-medical Specialists in Laboratory Medicine under EU Directive 2013/55/EU (The recognition of Professional Qualifications).

**EFLM Syllabus course consists of more than 40 modules and over 300 lectures which cover all four main sections of the EFLM Syllabus:**

- **Section A: the generic knowledge, skills and competencies that need to be acquired during training.**
- **Section B: the specialist knowledge within each discipline.**
- **Section C: the skills and competencies required to carry out research, development and audit.**
- **Section D: leadership skills and competencies.**

(1) Jassam N, Lake J, Dabrowska M, Queralto J, Rizos D, Lichtinghagen R, Baum H, Ceriotti F, O'Mullane J, Homšak E, Charilaou C, Ohlson M, Rako I, Vitkus D, Kovac G, Verschuure P, Racek J, Chifiriuc MC, Wieringa G. *The European Federation of Clinical Chemistry and Laboratory Medicine syllabus for postgraduate education and training for Specialists in Laboratory Medicine: version 5 - 2018. Clin Chem Lab Med* 2018;56(11):1846-63. doi: 10.1515/cclm-2018-0344. PMID: 29870392.

## Target Audience

This course is designed for postgraduate students, residents, young trainees and PhD students, and everyone else interested in laboratory medicine.

## The aim of the Course

The aim of this top quality revision course is to increase the knowledge and exam confidence for postgraduate students. It provides a comprehensive source of generic and specialist knowledge in laboratory medicine, to enable mastering necessary skills and competencies needed for the practice of laboratory medicine, as well as adopting leadership and management skills, which will empower the future specialists of laboratory medicine to work autonomously in complex environment of a clinical laboratory.

*Note: the aim of the course is not to provide a degree to course participants.*



I feel incredibly privileged for having the opportunity to work with such an amazing team and I believe we have done an amazing job together. There has been an enormous level of commitment and enthusiasm within the group, and it was an incredible motivating force for me to move the project forward.

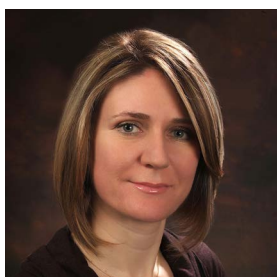
**Ana-Maria Šimundić**

EFLM TG-ESC chair  
EFLM President (2020-2021)

## COURSE ORGANIZING COMMITTEE



**Ana-Maria Šimundić**  
(Croatia)



**Snežana Jovičić**  
(Serbia)



**Lejla Alić**  
(Bosnia and Herzegovina)



**Silvia Cattaneo**  
EFLM office secretary  
(Italy)

## TG-ESC MEMBERS

Ana-Maria Šimundić, TG-ESC chair (Croatia)  
Snežana Jovičić, TG-ESC secretary (Serbia)  
Lejla Alić (Bosnia and Herzegovina)  
Josep Miquel Bauçà (Spain)  
Harjit Pal Bhattoa (Hungary)  
Michael Cornes (UK)  
Janne Cadamuro (Austria)  
Pilar Fernández Calle (Spain)  
Damien Gruson (Belgium)  
Evgenija Homšak (Slovenia)  
Marielle Kaplan (Israel)  
Michel Langlois (Belgium)  
Graham Lee (Ireland)  
Giuseppe Lippi (Italy)  
Tomris Ozben (Turkey)  
Mario Plebani (Italy)  
María Salinas (Spain)  
Zorica Šumarac (Serbia)  
Pieter Vermeersch (Belgium)  
Dalius Vitkus (Lithuania)

## EXTERNAL COURSE COORDINATORS

Josep M. Augé Fradera (Spain)  
Etienne Cavalier (Belgium)  
Barbara de la Salle (UK)  
Alejandro Gella (Spain)  
Anna Merino (Spain)  
Avi Peretz (Israel)  
Irma Salimović-Bešić (Bosnia and Herzegovina)

## EFLM TASK GROUP FOR SYLLABUS COURSE (TG-ESC)

The EFLM task group for Syllabus course (TG-ESC) is founded in January 2021 with the aim to deliver and maintain the EFLM European Syllabus Course.

For more info about the TG-ESC please visit: <https://www.eflm.eu/site/page/a/1388>

# GENERAL INFORMATION

## Course lectures

- All lectures are in English language;
- The length of all lectures is 45 minutes;
- Lectures are of educational nature and they cover useful information about routine biomarkers used in clinical practice:
  - indications for their use, based on clinical guidelines;
  - preanalytical sources of variation of these biomarkers;
  - analytical methods routinely used for their measurement, as well as reference methodology;
  - performance specifications of these biomarkers, their biological variation, clinical significance and reference change value;
  - postanalytical issues related to these biomarkers, such as reporting of the test results, reflex testing and interpretative comments, where and when applicable;
- Each lecture provides a number of practical examples and clinical cases (where and when applicable, depending on the topic of the lecture);
- Learning outcomes are defined for each lecture and provided in the beginning of the lecture;
- Each lecture provides 3–5 questions in the end for a quick check of the understanding of the topic.

## How to access the course?

The EFLM Syllabus Course is available for free to EFLM Academy members only, as a part of the package of exclusive benefits included in the annual Academy membership. The Course can be accessed at EFLM Academy webpage, with personal login credentials obtained after the enrolment in the EFLM Academy. (access link: <https://www.eflm.eu/eusplm-member>).

For all information about the course, please contact the EFLM office at: [eflm@eflm.eu](mailto:eflm@eflm.eu)

# PROGRAMME AT A GLANCE

MODULE	COORDINATOR
Leadership and management	Ana-Maria Šimundić
Biostatistics and data analysis	Ana-Maria Šimundić
Quality management	Mario Plebani, Pilar Fernández Calle, Janne Cadamuro, Dalius Vitkus
Analytical and clinical evaluation of laboratory methods	Snežana Jovičić
Preanalytical phase	Pieter Vermeersch, Zorica Šumarac, Michael Cornes, María Salinas
Post-analytical phase	Janne Cadamuro
Biological variation	Pilar Fernández Calle
Analytical principles and techniques	Michael Cornes, Josep Miquel Bauçà, Dalius Vitkus
POCT testing	Pilar Fernández Calle, Michael Cornes
Big-data and artificial intelligence	Janne Cadamuro
Enzymes	Dalius Vitkus, Snežana Jovičić
Tumour markers	Tomris Ozben, Mario Plebani, Josep M. Augé Fradera
Diabetes mellitus	Ana-Maria Šimundić, Snežana Jovičić, Zorica Šumarac
Lipids and CVD risk markers	Michel Langlois, Marielle Kaplan, Tomris Ozben
Electrolytes and blood gases	Marielle Kaplan
Nutrition	Tomris Ozben
Vitamins and trace elements	Snežana Jovičić, Ana-Maria Šimundić
Iron, haem metabolism and porphyrins	Snežana Jovičić, Pieter Vermeersch
Body fluids	Snežana Jovičić
Molecular diagnostics	Lejla Alić



Available for free to  
**EFLM Academy members only**

# PROGRAMME AT A GLANCE

MODULE	COORDINATOR
Therapeutic drug monitoring and pharmacogenomics	Pieter Vermeersch
Cardiac markers	Snežana Jovičić, Tomris Ozben, Damien Gruson
Renal function and urinalysis	Pieter Vermeersch, Etienne Cavalier
Liver and bile	Graham Lee
Inflammation	Marielle Kaplan
Immune system	Evgenija Homšak
Gastrointestinal system biochemistry	Snežana Jovičić, Mario Plebani, Ana-Maria Šimundić
Bone and mineral metabolism	Harjit Pal Bhattoa
Hormones	Damien Gruson
Reproductive endocrinology and pregnancy	Evgenija Homšak
Paediatric biochemistry and inherited metabolic disorders	Zorica Šumarac, Josep Miquel Bauçà, Pieter Vermeersch
Biochemical markers of neurological disorders	Tomris Ozben, Alejandro Gella
Organ transplantation	Mario Plebani
Introduction to haematology	Anna Merino, Barbara de la Salle
Automation and complimentary tests in haematology	Anna Merino, Barbara de la Salle
Non-malignant haematological disorders	Anna Merino, Barbara de la Salle
Malignant haematological disorders	Anna Merino, Barbara de la Salle
Haemostasis and fibrinolysis	Giuseppe Lippi
General microbiology	Avi Peretz
Bacteriology	Avi Peretz
Parasitology	Avi Peretz
Mycology	Avi Peretz
Virology	Irma Salimović-Bešić



# DETAILED PROGRAMME OF EACH MODULE

**Modules are accessible on individual basis without a specific order of attendance**

## MODULE 1: LEADERSHIP AND MANAGEMENT

Coordinator: Ana-Maria Šimundić

Leadership skills-introduction	Ana-Maria Šimundić (Croatia)
Communication skills	Arijana Meštrović (Croatia)
Time management skills	Ana-Maria Šimundić (Croatia)
How to build strong and efficient team	Alan Ivković (Croatia)
How to delegate tasks and empower people?	Velimir Srića (Croatia)
Change management	Janne Cadamuro (Austria)
Laboratory management	Geoffrey Baird (USA)
Laboratory health and safety management	Zorica Šumarac (Serbia)
Informed consent and ethical approval in laboratory medicine	Vesna Šupak Smolčić (Croatia)
Confidentiality and data protection in laboratory medicine	Jón Jóhannes Jónsson (Iceland)



## MODULE 2: BIOSTATISTICS AND DATA ANALYSIS

Coordinator: Ana-Maria Šimundić

Study design and potential sources of bias	Matthew S. Thiese (USA)
Data analysis and presentation	Helena Čičak (Croatia)
How to select a statistical test?	Dora Vuljanić (Croatia)
Difference tests for quantitative data	Marija Siter Kuprešanin (Croatia)
Difference tests for qualitative data	Adrijana Dorotić (Croatia)
Correlation and regression	Lidija Bilić Zulle (Croatia)
Survival analysis	Marko Lucijanić (Croatia)
Understanding Bland Altman analysis	Davide Giavarina (Italy)
Passing Bablok regression analysis	Lidija Bilić Zulle (Croatia)
Diagnostic accuracy: sensitivity and specificity, ROC curves	Patrick Bossuyt (The Netherlands)
Diagnostic accuracy: predictive values and LR	Patrick Bossuyt (The Netherlands)
STARD statement and diagnostic accuracy study design	Patrick Bossuyt (The Netherlands)
How to assess the quality of diagnostic accuracy study? QUADAS tool	Sally Lord (Australia)

## MODULE 3: QUALITY MANAGEMENT

Coordinators: Mario Plebani, Pilar Fernández Calle, Janne Cadamuro, Dalius Vitkus

Introduction to quality management systems

Marc Thelen (The Netherlands)

Quality indicators - basic principles

Mario Plebani (Italy)

Quality indicators - implementation in practice

Vincent DeGuire (Canada)

Traceability and commutability

Greg Miller (USA)

Setting analytical performance specifications

Federica Braga (Italy)

Developing a quality control plan

Graham Jones (Australia)

Monitoring analytical quality

Nuthar Jassam (UK)

Patient based quality control

Tony Badrick (Australia)

External quality assessment: state-of-the-art

Laura Sciacovelli (Italy)

Graphical presentation of internal and external quality control

Wim Coucke (Belgium)



**I am enthusiastic about the new EFLM educational initiative. Syllabus course is more than a course, it is an immense educational resource that encompasses the entire curriculum of laboratory medicine.**

### **Mario Plebani**

TG-ESC member and Module coordinator  
Editor in Chief, Clinical Chemistry and Laboratory Medicine (CCLM)  
Full Professor of Clinical Biochemistry and Clinical Molecular Biology  
Past-Dean of the Medical School, University of Padova  
Chief Department of Integrated Diagnostics  
University Hospital – Padova, Italy

# MODULE 4: ANALYTICAL AND CLINICAL EVALUATION OF LABORATORY METHODS

Coordinator: Snežana Jovičić

Verification of precision and estimation of bias

Tze Ping Loh (Singapore)

Evaluation of linearity of quantitative measurement procedures

Tze Ping Loh (Singapore)

Evaluation of detection capability for clinical laboratory measurement procedures

Ken Sikaris (Australia)

Evaluation of qualitative test performance

Joachim Pum (Germany)

Preliminary evaluation of quantitative clinical laboratory measurement procedures

Snežana Jovičić (Serbia)

Measurement procedure comparison and bias estimation using patient samples

Dora Vuljanić (Croatia)

Interference testing in clinical chemistry

Snežana Jovičić (Serbia)

How to construct and interpret an error grid for quantitative diagnostic assays

Nataša Bogavac-Stanojević (Serbia)

Traceability and measurement uncertainty

Neda Milinković (Serbia)

Defining, establishing, and verifying reference intervals in the clinical laboratory

Ken Sikaris (Australia)



The EFLM Syllabus Course is an educational treasure that sets the standard for professional development in Laboratory Medicine, and lays the professional foundation for harmonised clinical laboratory practice.

**Tze Ping Loh**

National University Hospital  
Singapore



## MODULE 5: PREANALYTICAL PHASE

Coordinators: Pieter Vermeersch, Zorica Šumarac, Michael Cornes, María Salinas

Patient preparation

Zorica Šumarac (Serbia)

Venous blood collection: introduction  
to collection systems and tubes

Mads Nybo (Denmark)

Venous blood collection: the EFLM-COLLABIOCLI guideline

Zorica Šumarac (Serbia)

Implementation of the EFLM-COLLABIOCLI guideline

Zorica Šumarac (Serbia)

Sample preparation

Andrea Padoan (Italy)

Sample transport and stability

Michael Cornes (UK)

Haemolysis: causes and impact on analyses

Ana-Maria Šimundić (Croatia)

Lipaemia and icterus

Vera Lukić (Serbia)

Haemolysis: detection and management

Ana-Maria Šimundić (Croatia)

Series of short cases

Pieter Vermeersch (Belgium)



The EFLM syllabus course is an important milestone for the EFLM. This project will give laboratory medicine trainees and professionals direct access to high-quality e-courses and will help improve the scientific, professional and clinical aspects of laboratory medicine in Europe.

### Pieter Vermeersch

Department of Cardiovascular Sciences, University of Leuven, Belgium; Clinical Department of Laboratory Medicine, University Hospitals Leuven, Belgium

## MODULE 6: POST-ANALYTICAL PHASE

Coordinator: Janne Cadamuro

Reference intervals - pros, cons and alternatives

Thomas Streichert (Germany)

Laboratory overuse - strategies to improve physician ordering and their impact on patient outcomes

Danielle Freedman (UK)

Laboratory diagnostic algorithms: a demand management tool to avoid laboratory underuse

María Salinas (Spain)

Laboratory report formatting:  
how the format may influence medical decisions

Janne Cadamuro (Austria)

Result management: defining and reporting alert and critical values

To be announced

Result management: reflex testing

Enrique Rodríguez Borja (Spain)

Result management: interpretative commenting

Wytze Oosterhuis (The Netherlands)

Series of successfully implemented demand management strategies

María Salinas (Spain)



**My motivation to contribute to this fantastic project is the premise that freely accessible education is key to human development.**

### **Janne Cadamuro**

TG-ESC member and Module coordinator  
University Hospital Salzburg, Paracelsus Medical University  
Department of Laboratory Medicine  
Salzburg, Austria

## MODULE 7: BIOLOGICAL VARIATION

Coordinator: Pilar Fernández Calle

How to derive and apply biological variation data  
– concepts and limitations

Aasne Karine Aarsand (Norway)

Biological variation data new and old;  
how to assess them and drive up their quality

William Bartlett (UK)

Interpretation of Biological Variation data:  
Reference Change Values

Sverre Sandberg (Norway)

Uses of biological variation in the total testing process  
for clinical practice

Pilar Fernández Calle (Spain)

Biological variation and personalized reference intervals.  
Theory and practice

Abdurrahman Coskun (Turkey)



More than **40 modules** and  
over **300 speakers** from all over the Globe!

# MODULE 8: ANALYTICAL PRINCIPLES AND TECHNIQUES

Coordinators: Michael Cornes, Josep Miquel Bauçà, Dalius Vitkus

Introduction to laboratory techniques

Michael Cornes (UK)

Laboratory automation and robotics

Mads Nybo (Denmark)

Principles of chromatography

Laura Owen (UK)

Spectroscopic methods 1: molecular absorption

Michael Cornes (UK)

Spectroscopic methods 2: turbidimetry, nephelometry, densitometry, fluorimetry

Lora Dukić (Croatia)

Spectroscopic methods 3: mass spectrometry

Andreas Thomas (Germany)

Spectroscopic methods 4: atomic spectroscopy

Chris Harrington (UK)

Electrochemistry and osmometry

Dalius Vitkus (Lithuania)

Immunochemistry

Lora Dukić (Croatia)

Interpretation of fraction irregularities in capillary electrophoresis

Axel Regeniter (Switzerland)

Biosensors

Gregori Casals (Spain)

Proteomics

Vathany Kulasingam (Canada)



Covers all four  
**main sections** of  
the EFLM Syllabus



## MODULE 9: POCT

Coordinators: Pilar Fernández Calle, Michael Cornes

Introduction. Concept. Areas of applicability.  
Technologies - past, present and future

Tony Cambridge (UK)

POCT in clinical settings  
in secondary care and in primary care.  
Pharmacy and direct-to-consumer

Adil I. Khan (USA)

Organisational and structural aspects for POCT networks  
including connectivity

Antonio Buño (Spain)

Key performance indicators

Paloma Oliver (Spain)

ISO framework. Particular considerations  
regarding ISO 22870 and ISO 15189 for the accreditation

Pilar Fernández Calle (Spain)

Instrument selection. Method performance verification  
and quality assurance in POCT

Anne Vegard Stavelin (Norway)

Personnel training and competency

Katy Heaney (UK)

Course offers a number of  
**practical examples and  
clinical cases**



## MODULE 10: BIG DATA AND ARTIFICIAL INTELLIGENCE

Coordinator: Janne Cadamuro

Introductory lecture

Janne Cadamuro (Austria)

Data warehouses and big data

Alexander Leichtle (Switzerland)

Artificial Intelligence in modern laboratory medicine

To be announced

# MODULE 11: ENZYMES

Coordinators: Dalius Vitkus, Snežana Jovičić

Basic principles of enzyme biochemistry

Jelena Vekić (Serbia)

Enzyme kinetics

Philip Monaghan (UK)

Analytical enzymology

Jelena Vekić (Serbia)

Isoenzymes and isoforms

Dalius Vitkus (Lithuania)

Macroenzymes

Joely A. Straseski (USA)

Enzymes in disease - liver and pancreatic enzymes

Joanna Siodmiak (Poland)

Diagnostic enzymology

Philip Monaghan (UK)

Enzymes in disease - clinical significance and methods for determination of CK

Goce Dimeski (Australia)

Enzymes in disease - LDH, ACE, cholinesterase

Joanna Siodmiak (Poland)



The EFLM Syllabus course is an amazing project, a true legacy for our profession. I feel privileged to be a part of it and of such an inspiring team.

**Snežana Jovičić**

TG-ESC member and Module coordinator

Center for Medical Biochemistry, Clinical Center of Serbia;

Department for Medical Biochemistry, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia



**Speakers are esteemed experts  
and well-known scientists**

## MODULE 12: TUMOUR MARKERS

Coordinators: Tomris Ozben, Mario Plebani, Josep M. Augé Fradera

Tumour markers: what is tumour marker?

Marta Kalousová (Czech Republic)

Clinical significance of tumour markers measured currently  
in medical laboratories

Vathany Kulasingam (Canada)

Methods to measure tumour markers

Catharine M. Sturgeon (UK)

Liquid profiling (biopsy) - Part 1

Evi S. Lianidou (Greece)

Liquid profiling (biopsy) - Part 2

Evi S. Lianidou (Greece)

Clinical cases (clinical use of serum tumour markers  
in daily practice)

Josep M. Augé Fradera (Spain)



**An essential platform of knowledge for teaching, increasing proficiency and learning  
up-to-date information in laboratory medicine prepared by the outstanding, renowned  
experts in their fields.**

### **Tomris Ozben**

EFLM President (2022-2023)

Dept. of Clinical Biochemistry

Faculty of Medicine, Akdeniz University, Antalya, Turkey

## MODULE 13: DIABETES MELLITUS

Coordinators: Ana-Maria Šimundić, Snežana Jovičić, Zorica Šumarac

Basic principles of regulation of glucose metabolism

Clinton R. Bruce (Australia)

Classification of diabetes, patogenesis, and diagnostic criteria

Marijana Vučić Lovrenčić (Croatia)

Preanalytical considerations in glucose measurement

Niamh Daly (Ireland)

HbA1c – preanalytical, analytical and clinical considerations

Cas Weykamp (The Netherlands)

Laboratory evaluation of acute complications of diabetes

Jaroslav Racek (Czech Republic)

Self-monitoring, minimally invasive and noninvasive monitoring of diabetes

Marijana Vučić Lovrenčić (Croatia)

Clinical and laboratory aspects of hypoglycaemia

Tony Huynh (Australia)

Metabolic syndrome

Hana Rosolová (Czech Republic)

Clinical cases

Eric Kilpatrick (UK)



**Fascinating and inspiring professional challenge. A powerful contribution to the improvement of knowledge. I am honored to be a part of this significant project.**

### **Zorica Šumarac**

Research Associate, Faculty of Medicine, University of Belgrade, Serbia

Deputy Director of Center for Medical Biochemistry

Head of the Department of the Polyclinic Laboratory, Clinical Center of Serbia, Belgrade, Serbia

Assistant Professor, Department for Biochemical Sciences, Faculty of Pharmacy, Novi Sad, Serbia



# MODULE 14: LIPIDS AND CVD RISK MARKERS

Coordinators: Michel Langlois, Marielle Kaplan, Tomris Ozben

Lipoprotein metabolism

Marielle Kaplan (Israel)

Primary and secondary lipoprotein disorders

Yacov Henkin (Israel)

Atherosclerosis (AS) and ASCVD risk factors

Borge Nordestgaard (Denmark)

Lipid and (apo)lipoprotein measurements  
and global standardization

Christa Cobbaert (The Netherlands)

Pre-and postanalytical phases of lipid testing

Michel Langlois (Belgium)

Lipidomics in health and diseases

Carla Ferreri (Italy)



It was a challenge and a privilege to have the opportunity to contribute to the Syllabus course. I believe it is going to serve many young colleagues throughout Europe and beyond.

## Michel Langlois

TG-ESC member and Module coordinator  
Department of Laboratory Medicine  
AZ St. Jan Hospital  
Bruges, Belgium

# MODULE 15: ELECTROLYTES AND BLOOD GASES

Coordinator: Marielle Kaplan

Normal physiology of sodium potassium and chloride

Marielle Kaplan (Israel)

Interpretation of  
electrolytes (sodium and potassium) disorders

Suheir Assady (Israel)

Physiology of acid-base balance

Zaid Abassi (Israel)

Interpretation of acid-base disorders

Zaid Abassi (Israel)

Sweat chloride measurement and clinical significance

Michal Gur (Israel)

Electrolytes and blood gases laboratory measurements

Marielle Kaplan (Israel)



Participation to this project for me, is an opportunity to emphasize the need for a standardized program in Laboratory Medicine specialization in Europe and beyond. The EFLM syllabus course project will have a positive repercussion on the professionalism of clinical Laboratory scientists in many countries and ultimately will lead to increased standards of professional practice and patients safety.

## Marielle Kaplan

Clinical Laboratories Division & Biochemistry Laboratory, Rambam Health Care Campus, Haifa, Israel  
The Rappaport Faculty of Medicine, Technion, Haifa, Israel

# MODULE 16: NUTRITION

Coordinator: Tomris Ozben

Macro and micronutrients. Essential and non-essential nutrients

Guidelines on definitions and terminology of clinical nutrition

Protein-energy malnutrition

Laboratory assessment of the hydration status

Nutritional support, principles of enteral and parenteral nutrition

Laboratory markers of nutritional status and monitoring of nutritional support

Nutritional and dietetic management of diseases

Applying genetic testing and nutrigenomics to clinical practice

Aysun Bay Karabulut (Turkey)

Pierre Singer (Israel)

Danijela Ristić Medić (Serbia)

Ruth Ayling (UK)

Andrew Day (UK)

Alan Shenkin (UK)

Omar A. Obeid (Lebanon)

Daiva E. Nielsen (Canada)



**On-demand access  
to all video lectures**

# MODULE 17: VITAMINS AND TRACE ELEMENTS

Coordinators: Snežana Jovičić, Ana-Maria Šimundić

Biochemistry and clinical significance of vitamins

Ravinder Sodi (UK)

Liposoluble vitamins

Lawrence de Koning (Canada)

Hydrosoluble vitamins

Lawrence de Koning (Canada)

Vitamin D

[Link to module: Bone and mineral metabolism](#)

Vitamin B12 and folic acid

[Link to module: Haematology](#)

Biochemistry and clinical significance of trace elements

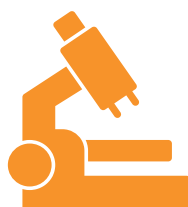
Chris Harrington (UK)

Laboratory assessment of trace element status

Andrew Taylor (UK)

Essential trace elements

Alan Shenkin (UK)



**Cutting-edge fields in  
laboratory medicine covered**



# MODULE 18: IRON, HAEM METABOLISM AND PORPHYRINS

Coordinators: Snežana Jovičić, Pieter Vermeersch

Systemic and cellular regulation of iron metabolism

Yelena Ginzburg (USA)

Laboratory assessment of iron body status

Snežana Jovičić (Serbia)

Iron deficiency anaemia vs. anaemia of chronic disease

[Link to module: Haematology](#)

Haemochromatosis: the key role of laboratory medicine

Pierre Brissot (France)

Biochemistry of haemoglobin

Aleksandra Stefanović (Serbia)

Thalassaemias and haemoglobinopathies

[Link to module: Haematology](#)

Laboratory assessment of porphyrias

Sverre Sandberg (Norway)



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## **Sverre Sandberg**

Past President of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)  
Director The Norwegian Organisation for Quality Improvement of Laboratory Examinations (NOKLUS),  
Director Norwegian Porphyria Centre (NAPOS)  
President of the European Porphyria Network Association (EPNET)  
Haukeland University Hospital, Bergen, Norway

## MODULE 19: BODY FLUIDS

Coordinator: Snežana Jovičić

Preamerical considerations in body fluids analysis

Laboratory analysis of cerebrospinal fluid

Laboratory analysis of pleural and pericardial fluid

Laboratory analysis of peritoneal fluid (ascites), dialysis and drainage fluids

Laboratory analysis of synovial fluid

Laboratory analysis of saliva

Cellular analysis of body fluids

Clinical cases

Snežana Jovičić (Serbia)

Svetlana Ignjatović (Serbia)

Eirini Tsilioni (USA)

Peadar McGing (Ireland)

Peadar McGing (Ireland)

Eirini Tsilioni (USA)

Michela Seghezzi (Italy)

All speakers



**Tips and tricks for  
laboratory medicine  
practice**

# MODULE 20: MOLECULAR DIAGNOSTICS

Coordinator: Lejla Alić

Basic principles of molecular diagnostics

Lejla Alić (Bosnia and Herzegovina)

Nucleic acid techniques (isolation, amplification and detection)

Lejla Alić (Bosnia and Herzegovina)

Genetics of monogenic and mitochondrial disorders and imprinting

Thomas Liehr (Germany)

Genetics of complex diseases

Gregor Hörmann (Germany)

Solid tumour genomics

Elaine Mardis (USA)

Genetic aspects of haematopoietic malignancies

Amina Kurtović-Kozarić (Bosnia and Herzegovina)

Epigenetic biomarkers and diagnostics

Luke B. Hesson (Australia)

Cell free DNA

Lejla Pojskić (Bosnia and Herzegovina)

Identity testing

Jasmina Čakar (Bosnia and Herzegovina)



It is my honour and pleasure to participate in such an important project for our profession! The whole team showed such a contagious enthusiasm and positive synergy, under the inspiring leadership of Prof. Šimundić. I wish I had these materials when I was studying.

**Lejla Alić**

TG-ESC member and Module coordinator  
Department of Medical Biochemistry, Faculty of Medicine University of Sarajevo,  
Sarajevo, Bosnia and Herzegovina

# MODULE 21: THERAPEUTIC DRUG MONITORING AND PHARMACOGENOMICS

Coordinator: Pieter Vermeersch

Principles of therapeutic drug monitoring

Pierre Wallemacq (Belgium)

Principles of pharmacogenomics

Janja Marc (Slovenia)

Clinical application of pharmacogenomics

Ron Van Schaik (The Netherlands)

Pharmacogenetic biomarkers predicting pharmacokinetics and pharmacodynamics of immunosuppressants

Laure Elens (Belgium)

Monitoring immunosuppressants after kidney transplantation

Dirk Kuypers (Belgium)

Monitoring immunosuppressants after liver transplantation

Florian Lemaitre (France)

Therapeutic drug monitoring of antiepileptic drugs

Alain Verstraete (Belgium)

The use of TDM in ensuring effective antibiotic therapy in hospitalized patients

Alain Verstraete (Belgium)

**The most comprehensive resource  
for laboratory medicine trainees**



# MODULE 22: CARDIAC MARKERS

Coordinators Snežana Jovičić, Tomris Ozben, Damien Gruson

Pathophysiology of the acute coronary syndrome

Ola Hammarsten (Sweden)

Cardiac troponins - analytical considerations

Päivi Laitinen (Finland)

Use of cardiac troponins for the diagnosis of myocardial infarction

Paul O. Collinson (UK)

Evaluation of congestive heart failure

Damien Gruson (Belgium)

Inflammation markers in the evaluation of cardiac risk

Thomas F. Lüscher (Switzerland)

Biochemical investigation and management of hypertension

Paula M. O'Shea (Ireland)

# MODULE 23: RENAL FUNCTION AND URINALYSIS

Coordinators: Pieter Vermeersch, Etienne Cavalier

Anatomy and physiology of kidney and urinary tract

Pieter Vermeersch (Belgium)

Assessment of kidney function  
and diagnosis of chronic kidney failure

Pierre Delanaye (Belgium)

Diagnosis of acute kidney injury

Konstantinos Makris (Greece)

Bone metabolism in CKD patients

Etienne Cavalier (Belgium)

Urine preanalytics and test strips

Timo Kouri (Finland)

Urine particle analysis

Timo Kouri (Finland)

Proteinuria and nephrotic syndrome

Joris Delanghe (Belgium)

Urine and stone analysis for the investigation of nephrolithiasis

Vincent Castiglione (Belgium)

Diagnosis and assessment of renal and bladder cancer

Jose Antonio Tesser Poloni (Brazil)

Diagnosis and assessment of prostate cancer

Jose Antonio Tesser Poloni (Brazil)



**This syllabus represents a fantastic opportunity to improve and harmonize medical laboratory competences of young European trainees in laboratory medicine.**

## Etienne Cavalier

President of the Royal Belgian Society of Laboratory Medicine  
Chairman of the IFCC Committee on Bone Metabolism (C-BM)  
Treasurer of the Belgian Bone Club  
Head, Department of Clinical Chemistry  
University of Liège, CHU de Liège, Belgium.

## MODULE 24: LIVER AND BILE

Coordinator: Graham Lee

Overview of the hepatobiliary system and enterohepatic circulation - structure and function

Graham Lee (Ireland)

Liver (dys)function tests for diagnosis and monitoring liver disease. Looking across the total testing pathway

Jenny Nobes (UK)

Bilirubin formation and classification of hyperbilirubinaemia

Maria Fitzgibbon (Ireland)

Jaundice of the newborn and familial causes of hyperbilirubinaemia and liver disease

Roy Peake (USA)

Liver and pregnancy

Ruth O'Kelly (Ireland)

Cirrhosis and end stage liver failure

Navneet Ramlal (Ireland)

## MODULE 25: INFLAMMATION

Coordinator: Marielle Kaplan

Inflammation - definition and pathophysiology

Marielle Kaplan (Israel)

The role of M1 pro-inflammatory and M2 anti-inflammatory macrophages in inflammation

Marielle Kaplan (Israel)

Acute phase and acute-phase proteins

Marielle Kaplan (Israel)

CRP as a biomarker for inflammation

Neval Uyar (Turkey)

Diagnosis and assessment of sepsis

Judith Attias (Israel)

Laboratory measurement of cytokines as inflammatory biomarkers: new perspectives with POCT devices

Ma'anit Shapira (Israel)

# MODULE 26: IMMUNE SYSTEM

Coordinator: Evgenija Homšak

Introduction of immune system  
(innate and acquired immunity)

Alojz Ihan (Slovenia)

Cellular immunity: diagnosis of immune deficiencies  
and tests for investigating

Alojz Ihan (Slovenia)

Humoral immunity and laboratory diagnostics

Mira Barak (Israel)

Complement factors and hereditary/acquired disorders

Zoltan Prohaszka (Hungary)

Immune disorders-immunoglobulin deficiency

Joanna Sheldon (UK)

Immune disorders-immunoglobulin  
overproduction/monoclonal gammopathy

Joanna Sheldon (UK)

Systemic autoimmune rheumatic  
diseases and systemic vasculitides

Joanna Sheldon (UK)

Antiphospholipid syndrome

Saša Čučnik (Slovenia)

Coeliac disease

Evgenija Homšak (Slovenia)

Atopic diseases (allergy and hyper-sensitivity)

Joanna Sheldon (UK)



## MODULE 27: GASTROINTESTINAL SYSTEM BIOCHEMISTRY

Coordinators: Snežana Jovičić, Mario Plebani, Ana-Maria Šimundić

Physiology of GIT and biochemical processes of digestion and absorption

Daniel Rajdl (Czech Republic)

Stomach - diseases and laboratory investigations

Edoardo Vincenzo Savarino (Italy)

Laboratory investigation of coeliac disease

Link to module: Immune system

Laboratory investigation of maldigestion, malabsorption, and diarrhoea

Roy Sherwood (UK)

Biomarkers in differential diagnosis of inflammatory bowel disease and irritable bowel syndrome

Daniela Basso (Italy)

Diseases and laboratory assessment of exocrine pancreatic function

Daniela Basso (Italy)

Gastrointestinal regulatory peptides and tumour markers for carcinoid syndrome and neuroendocrine neoplasms

H. Christian Weber (USA)

Bowel and colon cancer screening

Josep M. Augé Fradera (Spain)

Principles and practical problem of faecal analysis

Andrea Padoan (Italy)

Clinical cases

Josep M. Augé Fradera (Spain)

## MODULE 28: BONE AND MINERAL METABOLISM

Coordinator: Harjit Pal Bhattoa

Anatomy of the bone and physiology of bone metabolism

Markus Herrmann (Austria)

The role of PTH in bone metabolism

Etienne Cavalier (Belgium)

The role of vitamin D (and other hormones) in bone metabolism

Annemieke C. Heijboer (The Netherlands)

Markers of bone turnover

Harjit Pal Bhattoa (Hungary)

Laboratory investigations in the management of metabolic bone diseases

Samuel Vasikaran (Australia)

## MODULE 29: HORMONES

Coordinator: Damien Gruson

Thyroid gland: introduction and pathophysiology

Brigitte Decallonne (Belgium)

Thyroid disorders: clinical aspects and management

Brigitte Decallonne (Belgium)

Laboratory investigations in the management of thyroid disorders

Damien Gruson (Belgium)

Pituitary gland: introduction and pathophysiology

Damien Gruson (Belgium)

Pituitary gland: clinical aspects and management

Dominique Maiter (Belgium)

Laboratory investigations of the disorders of pituitary gland

Damien Gruson (Belgium)

Adrenal gland: introduction and pathophysiology

Caroline Le Goff (Belgium)

Adrenal gland: clinical aspects and management

Dominique Maiter (Belgium)

Laboratory investigations of the disorders of adrenal gland

Caroline Le Goff (Belgium)

Clinical cases

Dominique Maiter (Belgium)

## MODULE 30: REPRODUCTIVE ENDOCRINOLOGY AND PREGNANCY

Coordinator: Evgenija Homšak

Reproductive endocrinology of the gonads (female/male)

Janja Marc (Slovenia)

Importance of AMH (ovarian failure, menopause and polycystic ovarian syndrome)

Evgenija Homšak (Slovenia)

Biochemical assessment of hirsutism and virilization

Damien Gruson (Belgium)

Infertility (female/male): causes, investigations and treatment

Jure Knez (Slovenia)

Pregnancy (physiology and complications)

Faris Mujezinović (Slovenia)

Preeclampsia (pathophysiology and laboratory diagnostics)

Evgenija Homšak (Slovenia)

Prenatal testing (hormone, genetic and other tests)

Joško Osredkar (Slovenia)

# MODULE 31: PAEDIATRIC BIOCHEMISTRY AND INHERITED METABOLIC DISORDERS

Coordinators: Zorica Šumarac, Josep Miquel Bauça, Pieter Vermeersch

Pediatric reference values: challenges and recent advances

Khosrow Adeli (Canada)

Newborn screening: introduction and basic concepts

Hugo Rocha (Portugal)

Newborn screening: applications and perspectives

Raquel Yahyaoui (Spain)

Inherited metabolic disorders: introduction and awareness

Daisy Rymen (Belgium)

Disorders of organic acid metabolism

Sonia Pajares García (Spain)

Disorders of the carnitine cycle and fatty acid oxidation

Judith García Villoria (Spain)

Disorders of carbohydrate metabolism

Tim Lang (UK)

Mitochondrial energy generation disorders

Rudi Van Coster (Belgium)

Lysosomal storage diseases

Elena Dumin (Israel)

Purine and pyrimidine disorders:

Introduction - Metabolism and pathophysiology (Part 1)

Heterogenous group of disorders (Part 2)

Sandrine Marie and Joseph Dewulf (Belgium)

Dyslipoproteinaemia

[Link to module: Lipids and CVD risk markers](#)



**An authoritative and incredibly comprehensive course with a rich curriculum, and a truly valuable resource for both practicing laboratory professionals as well as young scientists and trainees from across Europe and around the world.**

**Khosrow Adeli**

President, IFCC  
Senior Scientist & Professor of Clinical Biochemistry  
University of Toronto, Toronto, Canada

## MODULE 32: BIOCHEMICAL MARKERS OF NEUROLOGICAL DISORDERS

Coordinators: Tomris Ozben, Alejandro Gella

Laboratory markers of Alzheimer's disease-update on CSF and blood tests for diagnosis and screening

Kaj Blennow (Sweden)

Laboratory markers of stroke

Joan Montaner (Spain)

Cerebrospinal fluid biomarkers as diagnostic and prognostic tools in Parkinson's disease

Lucilla Parnetti (Italy)

Laboratory markers of multiple sclerosis

Lorenzo Gaetani (Italy)

Laboratory markers of the mild traumatic brain injury

Henrik Zetterberg (Sweden)



The aim is  
to increase the knowledge and exam  
confidence for postgraduate students

## MODULE 33: ORGAN TRANSPLANTATION

Coordinator: Mario Plebani

The immunology of organ transplantation

Emanuele Cozzi (Italy)

Non Invasive Biomarkers in Solid Organ Transplant

Kayla Joyal (USA)

Intraoperative thromboelastography

Lesley de Pietri (Italy)

Donor derived cell-free DNA  
as a biomarker in transplantation  
to improve personalized immunosuppression

Michael Oellerich (Germany)

Perspective in pancreatic and kidney transplantation

Lucrezia Furian (Italy)

Monitoring of immunosuppressive therapies  
in organ transplantation: case reports

Mariela Marinova (Italy)

## MODULE 34: INTRODUCTION TO HAEMATOLOGY

Coordinators: Anna Merino, Barbara de la Salle

Haematopoiesis in health and disease

Tracey Smith-Straney (UK)

Morphology and kinetics of blood cells

Laura Boldú (Spain)

Critical values in haematology

Barbara de la Salle (UK)

Quality management in haematology

Richard McCafferty (Ireland)

## MODULE 35: AUTOMATION AND COMPLIMENTARY TESTS IN HAEMATOLOGY

Coordinators: Anna Merino, Barbara de la Salle

Automated cell analysis. Complete blood counts.  
Reticulocytes. Differential leucocyte analysis. ESR.

Sandra Gómez Rojas (Spain)

New parameters in automated counting

Cristian Morales Indiano (Spain)

Preparation, staining and examination of  
peripheral blood and bone marrow films

Javier Laguna (Spain)

Detection of pseudothrombocytopenia

Barbara de la Salle (UK)

Next generation sequencing and its application  
in rare haematological disease

Noémi Roy (UK)

Principles, methodology and application of flow cytometry

Javier Nieto Moragas (Spain)

Machine learning techniques  
in automatic blood cell recognition

Jose Rodellar (Spain)



**Access to the high-quality content of the EFLM Syllabus is an invaluable educational resource for trainees and students of laboratory medicine.**

**Barbara de la Salle**

UK NEQAS Haematology  
West Hertfordshire Hospitals NHS Trust, Watford, UK

## MODULE 36: NON-MALIGNANT HAEMATOLOGICAL DISORDERS

Coordinators: Anna Merino, Barbara de la Salle

Benign WBC disorders

Joana Silva (UK)

Classification of anaemia

Jhonatan Wong-Arteta (Spain)

Iron deficiency anaemia, the anaemia of chronic disease and the differential diagnosis

Eloísa Urrechaga (Spain)

Nutritional anaemia because of folic acid and vitamin B12 deficiency

Anthony Ermens (The Netherlands)

Pathophysiology and investigation of haemolysis (non-autoimmune/autoimmune HA)

Xavier Tejedor Ganduxé (Spain)

Haemoglobinopathies, haemoglobin variants and thalassaemia.

Detection of normal and variants haemoglobins

Teresa Villalba (Spain)

Red cell membranopathies and enzymopathies

Paola Bianchi (Italy)

Congenital and acquired thrombocytopenia

Sue Pavord (UK)

Clinical cases related to red blood cells

María Rodríguez García (Spain)

Clinical cases related to platelets

Ana Laila Qasem (Spain)

## MODULE 37: MALIGNANT HAEMATOLOGICAL DISORDERS

Coordinators: Anna Merino, Barbara de la Salle

Symptoms, pathogenesis and laboratory investigation of acute leukaemia

Anna Merino (Spain)

Symptoms, pathogenesis and laboratory investigation myelodysplastic syndromes

María Sanz de Pedro (Spain)

Symptoms, pathogenesis and laboratory investigation of myeloproliferative neoplasms

Angel Molina Borrás (Spain)

Symptoms, pathogenesis and laboratory investigation of lymphoid neoplasms

Maite Serrando (Spain)

Symptoms, pathogenesis and laboratory investigation of multiple myeloma

Aleix Borja Fabregat Bolufer (Spain)

Clinical cases related to haematological malignancy

Laura Boldú (Spain)

# MODULE 38: HAEMOSTASIS AND FIBRINOLYSIS

Coordinator: Giuseppe Lippi

Introduction on primary, secondary haemostasis and fibrinolysis	Giuseppe Lippi (Italy)
Preanalytics of haemostasis testing	Gian Luca Salvagno (Italy)
Classification, clinics and diagnosis of bleeding disorders	Emmanuel J. Favaloro (Australia)
Classification, clinics and diagnosis of thrombotic diseases	Martina Montagnana (Italy)
Disseminated intravascular coagulation (DIC)	François Mullier (Belgium)
Monitoring of anticoagulant therapy	Steve Kitchen (UK)
COVID-19-related coagulopathy	Brandon M. Henry (USA)



**The syllabus course is exactly what has been for long missing in the field of Laboratory Medicine.**

## **Giuseppe Lippi**

TG-ESC member and Module coordinator

Secretary of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)

Full Professor of Clinical Biochemistry, University of Verona

Director, Service of Laboratory Medicine, University Hospital of Verona

Executive Editor-in-Chief, Annals of Translational Medicine

Editor in Chief, Journal of Laboratory and Precision Medicine

Associate Editor, Clinical Chemistry and Laboratory Medicine

Associate Editor, Seminars in Thrombosis and Hemostasis



## MODULE 39: GENERAL MICROBIOLOGY

Coordinator: Avi Peretz

Automation and design of the clinical microbiology laboratory

Gilbert Greub (Switzerland)

The human microbiome

Omry Koren (Israel)

## MODULE 40: BACTERIOLOGY

Coordinator: Avi Peretz

Blood cultures

Oshrat Ayalon (Israel)

Body fluid cultures (excluding blood, cerebrospinal fluid and urine)

Milena Pitashny (Israel)

Helicobacter pylori

Francis Megraud (France)

Genital cultures and STD

Nadav Sorek (Israel)

Tuberculosis laboratory diagnostic methods

Yelena Losev (Israel)

Urine cultures

Yoram Keness (Israel)

Wound/Abscess and Soft tissue cultures

Milena Pitashny (Israel)

Susceptibility test methods

Amos Adler (Israel)



I am glad to be a part of this important project, in which any interested individual will be able to find the most recent knowledge in the field and expand their horizons through fascinating lectures. This is a project in which a lot of thought has been invested by an amazing team.

### Avi Peretz

Clinical Microbiology Laboratory, Baruch Padeh Medical Center, Poriya, Israel  
The Azrieli Faculty of Medicine, Bar-Ilan University, Safed, Israel

## MODULE 41: PARASITOLOGY

Coordinator: Avi Peretz

Malaria

Tamar Grossman (Israel)

Trematodes, Nematodes and Cestodes

Tamar Grossman (Israel)

Insects, mites and ticks of medical significance

Kosta Y. Mumcuoglu (Israel)

## MODULE 42: MYCOLOGY

Coordinator: Avi Peretz

Laboratory diagnostic methods in medical mycology

Sean Zhang (USA)

Pneumocystis

Or Kriger (Israel)

Aspergillus and Penicillium

Milena Pitashny (Israel)

Dematophytes and Superficial Mycoses

Milena Pitashny (Israel)

## MODULE 43: VIROLOGY

Coordinator: Irma Salimović-Bešić

Viral pathogenesis

Mark Heise (United States of America)

Hepatitis viruses

Snežana Židovec Lepej (Croatia)

Herpesviruses

Amela Dedeić-Ljubović (Bosnia and Herzegovina)

Human coronaviruses

Brankica Filipić (Serbia)

COVID-19 in-vitro diagnostics: State-of-the-Art Matthew

Irma Salimović-Bešić (Bosnia and Herzegovina)

COVID-19: Vaccines to prevent SARS-CoV-2 infection

Brankica Filipić (Serbia)

Influenza viruses

Daria Danilenko (Russia)

Human immunodeficiency virus (HIV)

Snježana Židovec-Lepej (Croatia)

Human papillomaviruses

Irma Salimović-Bešić (Bosnia and Herzegovina)

Hemorrhagic fever viruses

Sunit K. Singh (India)

Molecular biology and oncogenic pathways of human oncoviruses

Ezequiel M. Fuentes-Pananá (Mexico)

Therapeutic viruses

Susanne M. Bailer (Germany)

# SPEAKERS LIST

In alphabetical order – (to be updated)

SPEAKER; AFFILIATION	MODULES
<b>Aarsand, Aasne Karine;</b> Department of Medical Biochemistry and Pharmacology, Haukeland University Hospital; Norwegian Organization for Quality Improvement of Laboratory Examinations (Noklus), Bergen, Norway	7
<b>Abassi, Zaid;</b> Department of Physiology and Biophysics, Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Rambam Health Care Campus, Haifa, Israel	15
<b>Adeli, Khosrow;</b> Pediatric Laboratory Medicine and Molecular Medicine, The Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada	31
<b>Adler, Amos;</b> Clinical Microbiology Laboratory, Tel-Aviv Sourasky Medical Center, Tel Aviv, Israel	40
<b>Alić, Lejla;</b> Department of Medical Biochemistry, Faculty of Medicine University of Sarajevo, Sarajevo, Bosnia and Herzegovina	20
<b>Assadi, Suheir;</b> Department of Nephrology and Hypertension, Rambam Health Care Campus, The Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel	15
<b>Attias, Judith;</b> Emergency Laboratory, Rambam Health Care Campus, Haifa Israel	25
<b>Augé Fradera, Josep M.;</b> Clinical Chemistry and Molecular Genetics Department, Hospital Clinic, Barcelona, Catalonia, Spain	12, 27
<b>Ayalon, Oshrat;</b> Clinical Microbiology Laboratory, Hadassah University Medical Center, Jerusalem, Israel	40
<b>Ayling, Ruth;</b> Department of Clinical Biochemistry, Royal London Hospital, Newark Street, London, UK	16
<b>Badrick, Tony;</b> Royal College of Pathologists of Australasia, Quality Assurance Programs, St. Leonards, Sydney, Australia	3
<b>Bailer, M. Susanne;</b> Head of Innovationfield Virus-based technologies, Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB Institute of Interfacial Process Engineering and Plasma technology IGVP, University of Stuttgart	43
<b>Baird, Geoffrey;</b> Department of Laboratory Medicine and Pathology, University of Washington, Seattle, Washington, USA	1
<b>Barak, Mira;</b> Zefat Academic College, Zefat, Israel	26
<b>Bartlett, William;</b> Blood Sciences, Ninewells Hospital and Medical School, Scotland, UK	7
<b>Basso, Daniela;</b> Department of Laboratory Medicine, University Hospital of Padova; Department of Medicine-DIMED, University of Padova, Italy	27
<b>Bauçà, Josep Miquel;</b> Department of Laboratory Medicine, Hospital Universitari Son Espases, Palma, Spain	8
<b>Bhattoa, Harjit Pal;</b> Department of Laboratory Medicine, Faculty of Medicine, University of Debrecen, Debrecen, Hungary	28

# SPEAKERS LIST

SPEAKER; AFFILIATION	MODULES
<b>Bianchi, Paola;</b> Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy	36
<b>Bilić Zulle, Lidija;</b> Clinical Department of Laboratory Diagnostics, Rijeka University Hospital Center, Rijeka, Croatia	2
<b>Blennow, Kaj;</b> Clinical Neurochemistry Laboratory, Sahlgrenska University Hospital, Mölndal, Sweden	32
<b>Bogavac-Stanojević, Nataša;</b> Department for Medical Biochemistry, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia	4
<b>Boldú, Laura;</b> IDIBAPS (Institut d'Investigacions Biomèdiques August Pi i Sunyer), Barcelona, Spain	34, 37
<b>Bossuyt, Patrick;</b> Department of Epidemiology & Data Science, Amsterdam University Medical Centers, University of Amsterdam, Amsterdam, The Netherlands	2
<b>Braga, Federica;</b> Research Centre for Metrological Traceability in Laboratory Medicine (CIRME), University of Milan, Milan, Italy	3
<b>Brissot, Pierre;</b> Institut NuMeCan, Inserm U-1241, Univ Rennes 1, Rennes, France	18
<b>Bruce, Clinton R.;</b> Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia	13
<b>Buño, Antonio;</b> Department of Laboratory Medicine, La Paz University Hospital, Madrid, Spain	9
<b>Cadamuro, Janne;</b> University Hospital Salzburg, Paracelsus Medical University, Department of Laboratory Medicine, Salzburg, Austria	1, 6, 10
<b>Cambridge, Tony;</b> Pathology Management Team, University Hospitals Plymouth, NHS Trust, Plymouth, UK	9
<b>Casals, Gregori;</b> Biochemistry and Molecular Genetics, Hospital Clinic, Barcelona, Spain	8
<b>Castiglione, Vincent;</b> Department of Clinical Chemistry, CHU of Liège, University of Liège (ULg CHU), Liège, Belgium	23
<b>Cavalier, Etienne;</b> Department of Clinical Chemistry, University of Liège, CHU de Liège, Liège, Belgium	23, 28
<b>Cobbaert, Christa;</b> Department of Clinical Chemistry and Laboratory Medicine, Leiden University Medical Center, Leiden, The Netherlands	14
<b>Collinson, Paul O.;</b> Departments of Clinical Blood Sciences and Cardiology, St George's University Hospitals NHS Trust and St George's University of London, London, UK	22
<b>Cornes, Michael;</b> Biochemistry Department, Worcestershire Acute Hospitals NHS Trust, Worcester, UK	5, 8
<b>Coskun, Abdurrahman;</b> Acibadem Mehmet Ali Aydinlar University, School of Medicine, Atasehir, Istanbul, Turkey	7
<b>Coucke, Wim;</b> Quality of Laboratories Sciesano, Brussels, Belgium	3
<b>Cozzi, Emanuele;</b> Transplant Immunology Unit, University Hospital of Padova, Padova, Italy	33

# SPEAKERS LIST

SPEAKER; AFFILIATION	MODULES
<b>Jasmina Čakar;</b> Laboratory for Forensic Genetics, Institute for Genetic Engineering and Biotechnology, University of Sarajevo; Department of Biology, Faculty of Science, University of Sarajevo, Sarajevo, Bosnia and Herzegovina.	20
<b>Čičak, Helena;</b> Department of Medical Laboratory Diagnostics, University Hospital "Sveti Duh", Zagreb, Croatia	2
<b>Čučnik, Saša;</b> Department of Rheumatology, University Medical Centre Ljubljana, Ljubljana, Slovenia	26
<b>Daly, Niamh;</b> Rotunda Hospital and Royal College of Surgeons in Ireland, Dublin, Ireland	13
<b>Day, Andrew;</b> Department of Clinical Biochemistry, Bristol Royal Infirmary, University Hospitals Bristol and Weston NHS Foundation Trust, Bristol, UK	16
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<b>Delanaye, Pierre;</b> Department of Nephrology-Dialysis-Transplantation, University of Liège, CHU Sart Tilman, Liège, Belgium	23
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<b>Dewulf, Joseph;</b> Service de Biochimie génétique, Cliniques Universitaires Saint-Luc, Université Catholique de Louvain, Leuven, Belgium	31
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<b>Dumin, Elena;</b> Department of Clinical Biochemistry, Rambam Medical Center, Haifa, Israel	31

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<b>Elens, Laure;</b> Integrated PharmacoMetrics, pharmacoGenomics and pharmacoKinetics (PMGK) research group, Louvain Drug Research Institute (LDRI), UCLouvain; Louvain Centre for Toxicology and Applied Pharmacology (LTAP), Institut de Recherche Expérimentale et Clinique (IREC), UCLouvain, Belgium	21
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<b>Freedman, Danielle;</b> Clinical Biochemistry & Immunology, Luton & Dunstable University Hospital, Luton, Bedfordshire, UK	6
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<b>Giavarina, Davide;</b> Diagnostic department, Laboratory Medicine, St. Bortolo Hospital, Vicenza, Italy	2
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<b>Heijboer, Annemieke C.;</b> Endocrine Laboratory, Department of Clinical Chemistry, Amsterdam Gastroenterology & Metabolism, Vrije Universiteit Amsterdam and University of Amsterdam, Amsterdam, The Netherlands	28
<b>Heise, Mark;</b> Professor of Genetics, and Microbiology and Immunology, The University of North Carolina, USA	43
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<b>Homšak, Evgenija;</b> Department for Laboratory Diagnostics, University Clinical Centre Maribor, Maribor, Slovenia	26, 30
<b>Hörmann, Gregor;</b> MLL Münchner Leukämielabor GmbH, Munich, Germany	20
<b>Huynh, Tony;</b> Department of Endocrinology & Diabetes, Queensland Children's Hospital, South Brisbane, Queensland, Australia; Department of Chemical Pathology, Mater Pathology, South Brisbane, Queensland, Australia; School of Clinical Medicine, Faculty of Medicine, The University of Queensland, Brisbane, Queensland, Australia	13
<b>Ignjatović, Svetlana;</b> Center for Medical Biochemistry, Clinical Center of Serbia; Department for Medical Biochemistry, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia	19
<b>Ihan, Alojz;</b> Institute of Microbiology and Immunology, Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia	26
<b>Ivković, Alan;</b> Department of orthopaedics and traumatology, University hospital "Sveti Duh", Zagreb, Croatia	1
<b>Jassam, Nuthar;</b> Department of Clinical Biochemistry, Harrogate Foundation Trust, Harrogate, UK	3
<b>Jónsson, Jón Jóhannes;</b> Department of Genetics and Molecular Medicine, Landspítali - National University Hospital, Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Iceland, Reykjavík, Iceland	1



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<b>Kalousová, Marta;</b> Institute of Medical Biochemistry and Laboratory Diagnostics, Prague, Czech Republic	12
<b>Kaplan, Marielle;</b> Clinical Laboratories Division & Clinical Biochemistry Laboratory, Rambam Health Care Campus, The Rappaport Faculty of Medicine, Technion - Haifa, Israel	14, 15, 25
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<b>Kilpatrick, Eric;</b> Department of Clinical Biochemistry, Manchester University NHS Foundation Trust and Hull York Medical School, Manchester, UK	13
<b>Kitchen, Steve;</b> Department of Coagulation, Royal Hallamshire Hospital, Sheffield, UK	38
<b>Knez, Jure;</b> Department of gynecological oncology and breast oncology, University Clinical Centre Maribor, Maribor, Slovenia	30
<b>Koren, Omry;</b> Azrieli Faculty of Medicine, Bar-Ilan University, Safed, Israel	39
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<b>Kurtović-Kozarić, Amina;</b> Clinical Center of the University of Sarajevo, University of Sarajevo, Sarajevo, Bosnia and Herzegovina	20
<b>Kuypers, Dirk;</b> Department of Microbiology and Immunology, Catholic University of Leuven, Leuven, Belgium; Department of Nephrology and Renal Transplantation, University Hospitals Leuven, Leuven, Belgium	21
<b>Laitinen, Päivi;</b> Clinical Chemistry, HUS Diagnostic Center, University of Helsinki and Helsinki University Hospital, Helsinki, Finland	22
<b>Laguna, Javier;</b> Core Laboratory, Department of Biochemistry and Molecular Genetics, Biomedical Diagnostic Centre, Hospital Clínic, Barcelona, Spain	35

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<b>Le Goff, Caroline;</b> Department of Clinical Biochemistry, CHU de Liège, Liège, Belgium	29
<b>Lee, Graham;</b> Department of Clinical Biochemistry and Diagnostic Endocrinology, Mater Misericordiae University Hospital, Dublin, Ireland	24
<b>Leichtle, Alexander;</b> University Institute of Clinical Chemistry, Inselspital - Bern University Hospital and Center of Artificial Intelligence, University of Bern, Bern, Switzerland	10
<b>Lemaitre, Florian;</b> Univ Rennes, CHU Rennes, Inserm, EHESP, Irset (Institut de recherche en santé, environnement et travail), Rennes, France	21
<b>Lianidou, Evi S.;</b> Analytical Chemistry – Clinical Chemistry, Laboratory of Analytical Chemistry, Analysis of Circulating Tumor Cells (ACTC) Laboratory Department of Chemistry, University of Athens, Athens, Greece	12
<b>Liehr, Thomas;</b> Institute of Human Genetics, University Hospital Jena, Jena, Germany	20
<b>Lippi, Giuseppe;</b> Section of Clinical Biochemistry, University of Verona, Verona, Italy	38
<b>Loh, Tze Ping;</b> Department of Laboratory Medicine, National University Hospital, Singapore, Singapore	4
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<b>Losev, Yelena;</b> Central Laboratory for Tuberculosis, Ministry of Health, Jerusalem, Israel	40
<b>Lucijanić, Marko;</b> Hematology Department, University Hospital Dubrava, Zagreb, Croatia; University of Zagreb, School of Medicine, Zagreb, Croatia	2
<b>Lukić, Vera;</b> Department of laboratory diagnostics, Railway Healthcare Institute, Belgrade, Serbia	5
<b>Lüscher, Thomas F.;</b> Royal Brompton and Harefield Hospitals Trust and Imperial College, London, UK; Center for Molecular Cardiology, Schlieren Campus, University of Zurich, Zurich, Switzerland	22
<b>Maiter, Dominique;</b> Department of Endocrinology, Cliniques Universitaires Saint-Luc, Brussels, Belgium	29
<b>Makris, Konstantinos;</b> Clinical Biochemistry Department, KAT General Hospital, Kifissia, Greece	23
<b>Marc, Janja;</b> Faculty of Pharmacy, University of Ljubljana, Ljubljana, Slovenia; Institute for Clinical Chemistry and Biochemistry, University Clinical Centre Ljubljana, Slovenia	21, 30
<b>Mardis, Elaine;</b> Institute of Genomic Medicine, Nationwide Children's Hospital, Columbus, Ohio, USA	20
<b>Marie, Sandrine;</b> Service de Biochimie génétique, Cliniques Universitaires Saint-Luc, Université Catholique de Louvain, Leuven, Belgium	31
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<b>Milinković, Neda;</b> Department for Medical Biochemistry, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia	4
<b>Miller, Greg;</b> Clinical Chemistry Department, Pathology Information Systems, Virginia Commonwealth University, Richmond, USA	3
<b>Molina Borrás, Angel;</b> Core Laboratory, Department of Biochemistry and Molecular Genetics, Biomedical Diagnostic Centre, Hospital Clínic, Barcelona, Spain	37
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<b>Morales Indiano, Cristian;</b> Laboratory Medicine Department. Laboratori Clínic Metropolitana Nord, Hospital Germans Trias i Pujol, Badalona, Spain	35
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<b>Nordestgaard, Borge;</b> Copenhagen University Hospital, Herlev Gentofte Hospital, Dept. Clinical Biochemistry, Herlev, Denmark; University of Copenhagen, Institute of Clinical Medicine, Faculty of Health and Medical Sciences, Copenhagen, Denmark	14
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<b>Owen, Laura;</b> Clinical Biochemistry Department, Royal Salford NHS Trust, UK; University of Manchester, Manchester, UK	8
<b>Padoan, Andrea;</b> Department of Medicine-DIMED, Medical School, University of Padova; Department of Laboratory Medicine, University Hospital of Padova, Padova, Italy	5, 27
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<b>Prohaszka, Zoltan;</b> Third Department of Internal Medicine, Semmelweis University, Budapest, Hungary	26
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<b>Qasem, Ana Laila;</b> Laboratory Medicine Department, La Paz University Hospital, Madrid, Spain	36
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<b>Rodríguez García, María;</b> Core Laboratory, Department of Biochemistry and Molecular Genetics, Biomedical Diagnostic Centre, Hospital Clínic, Barcelona, Spain	36
<b>Rosolová, Hana;</b> Centre of Preventive Cardiology of the 2nd Department of Internal Medicine, University Hospital, Pilsen, Czech Republic; Czech Institute for Metabolic Syndrome, Czech Republic	13
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<b>Rymen, Daisy;</b> Center for Metabolic diseases, University Hospitals Leuven, Belgium	31
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<b>Sandberg, Sverre;</b> Department of Medical Biochemistry and Pharmacology, Haukeland University Hospital; Norwegian Organization for Quality Improvement of Laboratory Examinations (Noklus); Department of Global Public Health and Primary Care, University of Bergen, Bergen, Norway	7, 18
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<b>Silva, Joana;</b> Morphology and Immunophenotyping, Oxford University Hospitals Foundation Trust, Oxford, UK	36
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<b>Siodmiak Joanna;</b> Department Laboratory Medicine, Faculty of Pharmacy, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Torun, Bydgoszcz, Poland	11
<b>Siter Kuprešanin, Marija;</b> Department of Medical Laboratory Diagnostics, University Hospital "Sveti Duh", Zagreb, Croatia	2
<b>Smith-Straney, Tracey;</b> Department of Haematology, Liverpool University Hospital NHS Foundation Trust, Liverpool, UK	34
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<b>Sorek, Nadav;</b> Clinical Microbiology Laboratory, Assuta Medical Center, Tel Aviv, Israel	40
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<b>Streichert, Thomas;</b> Institute for Clinical Chemistry, Faculty of Medicine, University of Cologne, Germany	6
<b>Sturgeon, Catherine M.;</b> Department of Laboratory Medicine, Royal Infirmary of Edinburgh, Edinburgh, UK	12
<b>Šimundić, Ana-Maria;</b> Department of Medical Laboratory Diagnostics, University Hospital "Sveti Duh", Zagreb, Croatia	1, 5
<b>Šumarac, Zorica;</b> Faculty of Medicine, University of Belgrade, Serbia; Center for Medical Biochemistry, Department of the Polyclinic Laboratory, Clinical Center of Serbia, Belgrade, Serbia; Department for Biochemical Sciences, Faculty of Pharmacy, Novi Sad, Serbia	1, 5

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<b>Taylor, Andrew;</b> SAS Trace Element Centre, Surrey Research Park, Guildford, Surrey, UK	17
<b>Tejedor Ganduxé, Xavier;</b> Laboratori Clínic Metropolitana Nord, Hospital Germans Trias i Pujol, Badalona, Spain	36
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<b>Thelen, Marc;</b> Laboratory for Clinical Chemistry, Result Laboratorium, Amphia, Breda, The Netherlands	3
<b>Thiese, Matthew S.;</b> Rocky Mountain Center for Occupational and Environmental Health, University of Utah School of Medicine, Salt Lake City, Utah, USA	2
<b>Thomas, Andreas;</b> Institute of Biochemistry/Center for Preventive Doping Research, German Sport University, Cologne, Germany	8
<b>Tsilioni, Eirini;</b> ExosomeDx, a Bio-Techne Brand, Waltham, Massachusetts, USA	19
<b>Urrechaga, Eloísa;</b> Biocruces Bizakaia Health Research Institute, Baracaldo, Spain	36
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<b>Van Coster, Rudi;</b> Ghent University Hospital, Gent Area, Belgium	31
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<b>Vermeersch, Pieter;</b> Department of Cardiovascular Sciences, University of Leuven, Belgium; Clinical Department of Laboratory Medicine, University Hospitals Leuven, University of Leuven, Belgium	5, 23
<b>Verstraete, Alain;</b> Department of Laboratory Medicine, Ghent University Hospital, Ghent, Belgium; Department of Diagnostic Sciences, Ghent University, Ghent, Belgium	21
<b>Villalba, Teresa;</b> Hematología, Catlab, Terrassa, Spain	36
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<b>Vuljanić, Dora;</b> Department of Medical Laboratory Diagnostics, University Hospital "Sveti Duh", Zagreb, Croatia	2, 4
<b>Wallemacq, Pierre;</b> Louvain Centre for Toxicology and Applied Pharmacology (LTAP), Institut de Recherche Expérimentale et Clinique, UCLouvain and Department of Clinical Chemistry, Cliniques Universitaires Saint-Luc, Brussels, Belgium	21
<b>Weber, H. Christian;</b> Boston University School of Medicine, Gastroenterology and Hepatology; VA Boston Healthcare System, Gastroenterology and Hepatology, Boston, Massachusetts, USA	27
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# ABOUT EFLM ACADEMY

The EFLM Academy offers an exclusive individual membership for Specialists in Laboratory Medicine and everyone else interested in laboratory medicine.

## The aims of EFLM Academy are:

- ✓ To support education, training and continuous professional development of laboratory medicine practitioners,
- ✓ To provide an online platform with a wealth of useful information,
- ✓ To raise the EFLM profile.

## Who can be a member of the EFLM Academy?

Eligible individuals for membership in the EFLM Academy are:

- ✓ All individuals who are interested in Laboratory Medicine
- ✓ Representatives of diagnostics companies

## Which are the benefits for EFLM Academy Members?

By becoming a member of the EFLM Academy, you are entitled to the package of professional benefits for listed below.

	EFLM Countries		Non EFLM Countries		IVD reps
Education and training	Individual Registrations	National Society en bloc registration	Individual Registrations	National Society en bloc registration	Individual Registrations
Free access to EFLM live webinars	✓	✓	✓	✓	✓
Free access to EFLM webinars on demand	✓	✓	✓	✓	✓
Free access to EFLM Syllabus Course (available from Jan 2022)	✓	✓	✓	✓	✓
Reduced registration fee for EFLM congresses and conferences (*)	✓	✓	✓	✓	✓
Reduced registration fee for EFLM postgraduate courses	✓	✓	✓	✓	✓

	EFLM Countries		Non EFLM Countries		IVD reps
Resources	Individual Registrations	National Society en bloc registration	Individual Registrations	National Society en bloc registration	Individual Registrations
Free access to CLSI Documents		✓		✓	
CLSI membership at a reduced rate (25% discount)	✓		✓		
Free access to Clinical Chemistry Laboratory Medicine Journal	✓	✓	✓	✓	
Free access to Clinical Chemistry Journal	✓	✓	✓	✓	
Free access to Journal of Applied Laboratory Medicine	✓	✓	✓	✓	
Free access to Critical Reviews in Clinical Laboratory Sciences Journal	✓	✓	✓	✓	
Free access to Clinical Biochemistry Journal	✓	✓	✓	✓	
Free access to Scandinavian Journal of Clinical and Laboratory Investigation	✓	✓	✓	✓	
Free access to Annals of Clinical Biochemistry Journal	✓	✓	✓	✓	
Regular e-mail notifications about all EFLM activities, programmes and opportunities	✓	✓	✓	✓	✓

	EFLM Countries		Non EFLM Countries		IVD reps
Eligibility to apply for (**)	Individual Registrations	National Society en bloc registration	Individual Registrations	National Society en bloc registration	Individual Registrations
EFLM travel grants	✓	✓			
EFLMLabX bursaries	✓	✓			
EFLM Academy Award	✓	✓			
EFLM EuSpLM Register	✓	✓			

(\*) - does not apply to EuroMedLab

(\*\*) - specific criteria apply to each listed item (criteria shall be made available with each call for applications)

# ABOUT EFLM ACADEMY



## How can I become a member of the EFLM Academy?

### Block enrollment from National Societies

EFLM encourages its National Societies to establish automatic block enrolment of its members into the EFLM Academy. Two simple steps are necessary to active a block enrolment:

#### ✓ THE AGREEMENT

The block enrollment is based on an agreement signed between EFLM and the National Society (please contact the EFLM Office: [eflm@eflm.eu](mailto:eflm@eflm.eu) to receive the proposal of agreement). Important: agreements signed during the year will be valid for registrations starting in the coming year (i.e. if an agreement is signed in April 2021, registrations will start from Jan 1, 2022).

#### ✓ THE LIST OF MEMBERS TO REGISTER

Within 31st December each year, National Societies will be asked by the EFLM Office to send the list of members to register for the coming year.

### Individual registration

If the EFLM National Society does not support the block enrolment or for those individuals from non-EFLM National Societies and In Vitro Diagnostics (IVD) representatives, individual membership is possible at this on-line registration link.

Please note that individual registrations do not have the free access to CLSI documents among the benefits.

In both the above cases, the annual fee is 15 Euros and is valid from 1 January to 31 December.

# EFLM SYLLABUS COURSE



EUROPEAN FEDERATION OF CLINICAL CHEMISTRY  
AND LABORATORY MEDICINE

EFLM Office

[eflm@eflm.eu](mailto:eflm@eflm.eu)

(for information about the EFLM Academy)



MZ Virtual

[eflm-elearning@mzevents.it](mailto:eflm-elearning@mzevents.it)

(for technical information about the EFLM Syllabus Course)

