EUCIC EUROPEAN COMMITTEE ON INFECTION CONTROL

European Society of Clinical Microbiology and Infectious Diseases

EUCIC IPC Certificate v 2.0

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The EUCIC Infection Prevention and Control Certificate

-European Training Programme-

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Abbreviations

ASP	Antimicrobial stewardship programmes
CAI	Community-acquired infections
CM	Clinical microbiology
EC	Executive committee
ECTS	European Credit Transfer and Accumulation System
ESCMID	European Society of Clinical Microbiology and Infectious Diseases
EUCIC	European Committee on Infection Control
HAI	Healthcare-associated infections
HCW	Healthcare worker
HH	Hospital hygiene
IC	Infection control
ICU	Intensive care unit
ID	Infectious diseases
IPC	Infection prevention and control
IT	Information technology
MDROs	Multidrug-resistant organisms
MLST	Multilocus sequence typing
PCR	Polymerase chain reaction
PH	Public health
PPE	Personal protective equipment
SC	Steering committee
SPC	Statistical process control

Concept and coordination of the training programme

Evelina Tacconelli, Alex W. Friedrich and Nico T. Mutters

EUCIC education working group and education board

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Foreword

Healthcare-associated infections (HAIs) are a leading cause of morbidity and mortality worldwide. Of even more concern, therapy of HAIs is becoming more difficult due to the increasing rate of antimicrobial resistance among common HAI causing pathogens. Over the last decade, multidrug-resistant organisms (MDROs) have been implicated in severe invasive infections and their occurrence has been increasing steadily in healthcare institutions and in the community. Patients and healthcare organizations alike are starting to use the rate of HAI and antibiotic resistance as an important indicator of quality of care.

In addition to well-known risk factors of HAI, international migration, travel and country-to-country transfer of patients lead to a permanently increasing risk of spreading MDROs, which means that the introduction and establishment of MDROs in previously unaffected or less affected regions is becoming more likely every day. The same applies to the spread of new virus variants. Successful infection prevention and control (IPC) can therefore no longer be established by individual healthcare institutions at the local level alone, and international cooperation has become an absolute necessity to control further spread of pathogens. Knowledge and experience gathered in one's own speciality, healthcare institute and country is important but far too limited to prevent communicable disease, HAI and especially antibiotic resistance. Therefore, there is a need to change from a purely competence-based to a meta-competence-based learning system, introducing a multidisciplinary and multi-professional approach. Training cannot be limited to IPC in the local healthcare institution and to an individual's professional knowledge (monovalent competence) but needs to be extended to multiple healthcare institutions in the regional/national healthcare network and involve (direct interaction with) a multidisciplinary team (polyvalent meta-competence).

Europe's approach to IPC still varies enormously between different countries and sometimes also between different healthcare settings within the same country. However, every country has a certain expertise and/or specialty to offer. The mutual exchange of knowledge is a key feature of providing a European perspective in IPC – a European competence. Major goals of EUCIC are to contribute to the harmonization of IPC and the standardization of procedures in Europe. To reach this objective, education plays a pivotal role. A pan-European competence in IPC is indeed vital to meet the challenges (e.g. changing infectious disease epidemiology, demographic changes and migration) currently confronting IPC specialists. Such competence can only be established if the three fields, clinical microbiology (CM), infectious diseases (ID) and infection control/hospital hygiene (IC/HH), work together towards building an inter-professional and/or inter-disciplinary IPC network, the basis of successful IPC. Only then can operational regional infection control be established and only on that basis can a European competence be achieved.

The EUCIC Infection Prevention and Control Certificate is the first training programme providing both meta- and European competence (Fig. 1). Graduates of the EUCIC programme will be able to cope with the major challenges that are ahead of us in the field of infection prevention and control.

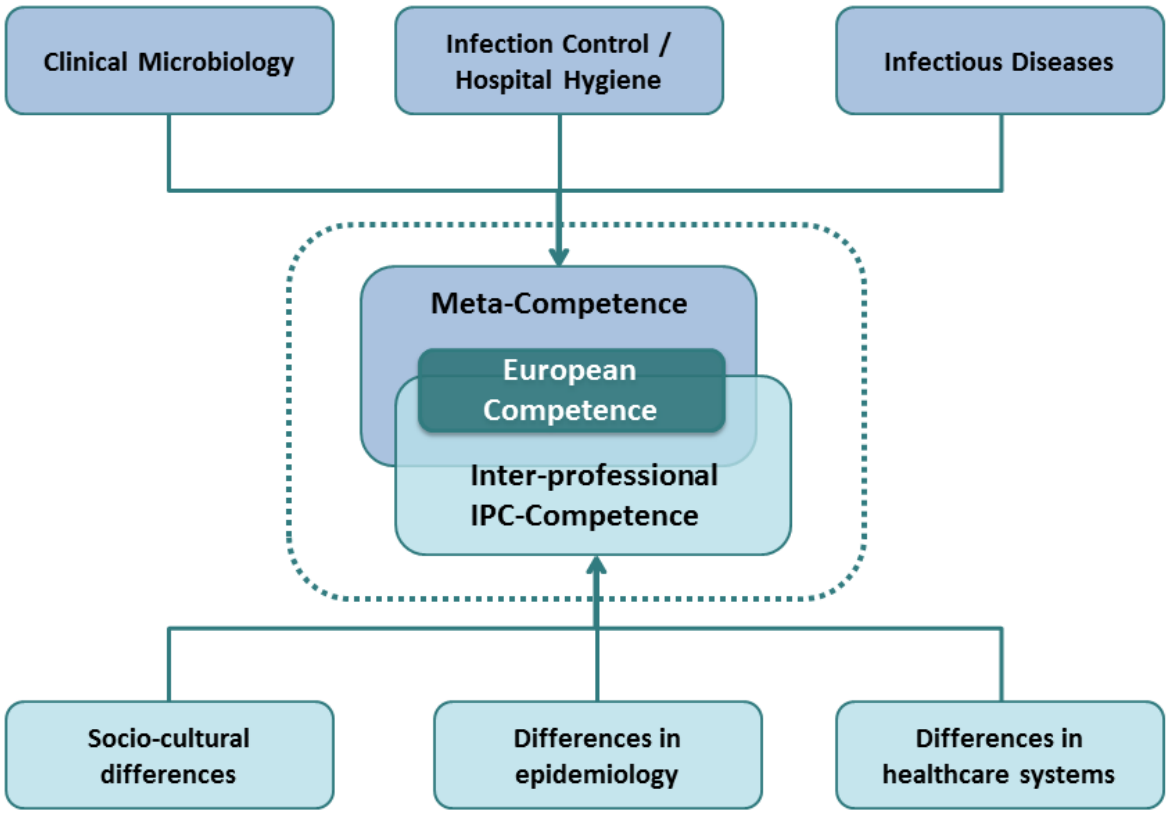

Figure 1: Overview of key aspects of the EUCIC infection prevention & control certificate

Aims of the programme

The programme aims to train individuals in current IPC practices, providing trainees with a European perspective and a meta-competence in IPC. On the one hand, trainees will acquire theoretical and practical knowledge about CM, ID and HH/IC. On the other, they will learn about the differences and similarities of the many European IPC systems. Graduates will acquire competence focused on IPC in Europe, including adapting to, anticipating and creating change in healthcare practices. In terms of meta-competence, the trainees will learn how to apply their own professional knowledge (monovalent competence) in the multidisciplinary team that is needed in their own country and hospital environment (polyvalent meta-competence) by applying network-based learning and network-based governance models.

Graduates of the programme will have acquired the necessary knowledge and skills to make a significant contribution to this extremely important emerging field. The programme prepares participants for research positions, academic and/or teaching careers, positions in national and international organizations related to IPC, employment in IPC departments of healthcare institutions, and governmental positions. Whether starting, continuing or advancing their career in IPC, graduates will be able to actively stimulate the IPC dynamic.

Learning objectives

The programme covers 11 learning areas in which all relevant basic (indicated with B in the table) and advanced (A in the table) aspects of IPC are addressed.

Area 1 – Epidemiology and transmission of healthcare-associated infections		
Understanding different modes of transmission of pathogens (viral, bacterial, parasitic, fungal)		B
Differentiation of infection, colonization, and contamination		
Principles of HAI		
	Influence of HAI on patient safety and potential socioeconomic burden	
	Requirements in organizational structure for HAI control (multidisciplinary cooperation)	
	Appropriate indicators for the control of HAI and antimicrobial resistance	
	HAI evaluation and interpretation of data collected from healthcare organizations	
	Review of policies for HAI prevention and control	
	Event rate calculation and risk-adjustment for HAIs and other patient adverse events	
	Cost implications of nosocomial infections	
Environmental sources of infection		
Pathogenesis of HAI and community-acquired infections (CAI)		
	Association between HAI and medical devices	

	Respiratory tract infections	B
	Urinary tract infections	
	Bloodstream infections	
	Healthcare-associated diarrhoea	
	Surgical site infections	
	Infections in high-risk populations	

Area 2 – Microbiological diagnostic skills			
Basic microbiological methods			B
	Microbiological cultures		
	Susceptibility testing and interpretation		
	Other basic microbiological methods (e.g. serology)		
Performance characteristics of different testing methods and principles used in clinical laboratories (i.e. culture-based methods, serology, rapid diagnostics and molecular assays)			
Biochemical markers			
Microbiological infrastructure and qualification (medical/clinical/scientific microbiologists, in hospitals, private laboratories, other forms of infrastructure)			
Advanced and modern methods of CM			A
	Real time PCR and other molecular methods		
	Typing methods		
		Next generation sequencing, WGS etc.	
		MLST, spa-typing, RAPD, MLVA etc.	
	Combining molecular data with epidemiological data for outbreak control		
Screening			B
	Indication for screening		
	Implementation of screening and types of screening protocols		
Availability of medical microbiology for diagnostic stewardship (24/7, daily, weekly consultancy, by phone, at the location)			A
Diagnostic stewardship			

Area 3 – Antibiotic therapy and antibiotic stewardship programmes	
Antimicrobial therapy	

	Resistance situation in Europe – epidemiological overview	A
	Appropriate antimicrobial therapy regimens for common infectious diseases including bacterial, viral and fungal infections	
	Relationship between antimicrobial use and antimicrobial resistance	
	Interventions to reduce antimicrobial resistance	
	Biofilm active agents	
	Bacteriophages	
Antimicrobial stewardship programmes (ASP)		
	Mission and goals of an ASP	
	Roles and responsibilities of stakeholders in antimicrobial stewardship (e.g. physician, pharmacist, IPC practitioner, microbiologist, administrator)	
	Multidisciplinary strategies for antimicrobial stewardship	
	Major limitations of antimicrobial stewardship	
Information technology (IT) and ASP		
	Minimum requirements and strategies for automatic support systems	
	IT decision support systems for antimicrobial therapy	
	Automated alert systems for new microbiological results and/or therapy adaption	

Area 4 – Practical IPC skills	
Wearing of personal protective equipment (PPE)	B
Hand hygiene: multimodal hand hygiene improvement strategy, methods for compliance monitoring, targets for improvement, self-assessment framework	
Catheter insertion and maintenance, including sharps handling, choice and application of appropriate precautions	
Prevention of ventilator-associated pneumonia	
Choice and application of appropriate precautions and measures in different scenarios	
Correct handling and disposal of sharps, handling of spilled blood	
IPC bundle approaches	

Area 5 – Development and implementation of IPC programmes	
Development and key elements of an IPC programme, including: • mission statement, • description of objectives and indicators	

• presentation of an action plan (including outcomes, success measures, rules for the functioning of the infection control committee, operating manual, links to other patient safety and healthcare organization programmes)	
Adherence to EU, national or local regulations, healthcare organization policies, and existing guidelines	A
Public health topics concerning infection control e.g. vaccination, sexually transmitted diseases, foodborne outbreaks, Q-fever.	
Review, assess, recommend and provide appropriate resources for infection control in the healthcare organization: scientific and technical expertise, facilities for infection control, information systems, continuing education, use of link professionals, allocated budget	
Use cost-benefit analyses for infection control activities	
Responsible handling of an infection control budget	
Regional collaboration with other healthcare institutions	
Joining/founding a regional, national or international prevention programme	
Coordination of infection control activities with other safety programmes	
Appropriate reporting of IPC findings	
Teamwork: tools for sharing responsibilities, exchanging information, and planning tasks	A
Familiarization with common products used in healthcare for infection prevention and whether evidence exists for their use (e.g. antibiotic impregnated devices)	
IT tools for infection control programmes: automatic risk assessment of patients at admission; semi-automated epidemiologic surveillance based on the electronic medical record of each patient	
Understand emergency preparedness concepts	
Understand and implement correct infection control interventions	
Contributing to reducing antimicrobial resistance	
Advising appropriate laboratory testing and use of laboratory data	
Effective outbreak investigation: developing a case definition, identifying cases, creating a line listing, creating epidemic curves, and collecting and evaluating specimens and cultures	
Public outbreak management, including sequencing and molecular typing, to identify, investigate and manage outbreaks	
Appropriately incorporate results of rapid diagnostic testing into infection prevention interventions	

Area 6 – Occupational health	
Assurance of healthcare worker safety, internal information exchange and public disclosure of information, respecting ethical standards for patient protection	**B**
Screening and immunization of healthcare workers	
PPE (personal protective equipment)	
Biohazards (e.g. sharps) and biohazard management	
Medical waste regulation	
Post exposure prophylaxis	
Role of healthcare workers in outbreaks (particularly viral-borne, e.g. influenza, norovirus) as vectors or accelerators	
Laboratory safety (e.g. working with *Brucella*, HIV, hepatitis B/C)	

Area 7 – Scientific and Managerial Implementation		
Contributing to quality management		**A**
	Evaluate IC in collaboration with HCWs, patients and their relatives	
	Develop concepts of patient safety	
	Understand the concept of failure modes, effect analysis and root-cause analysis	
Contributing to risk management		
	Integrate risk management programmes into IC within the healthcare organization	
	Perform audits of professional practices and evaluate performance, thereby taking into account different clinical and cultural circumstances	
Prepare protocols for the evaluation of performance		
Assess institution performance compared with national benchmarks and target areas for improvement		
Train others to do assessments		
IC training of employees		
Leadership and management skills (i.e. agenda development, inclusiveness, action and follow up, clearly define responsibilities and task management, establish feedback mechanisms)		
Interpersonal skills: knowledge of behavioural sciences, negotiation skills		
Communication skills: communication between different levels of care, HCWs, etc.		
Assessments in field e.g. isolation precautions inclusive feedback to assessed units		
Collaboration with multidisciplinary experts (meta-competence)		

Area 8 – Data analysis, management and publication		
Principles of evaluative and research studies		A
	Basic concepts of statistics and epidemiology	
	Test characteristics (e.g., sensitivity, specificity, positive and negative predictive value, incidence and prevalence) of an infection or pathogen	
	Establish appropriate control measurements and generate exposure ratios, relative risks, or odds ratios and confidence intervals	
	Principles of bias and confounders	
	Study designs (efficacy, cost-effectiveness or intervention)	
	How to design an IC study intervention	
	Understand and select appropriate study design (e.g. case control vs. cohort) for an outbreak investigation	
Basic data management		
	Applying appropriate epidemiological methods during data collection in accordance with study design and defined methodology to ensure reliability and reproducibility, and to correct for bias	
	Identifying outcome data and exposure data	
	Analyses/interpretation/evaluation of results	
Statistical process control (SPC)		
	IT tools for run- and control charts to distinguish (non-random variation) from noise (random variation) in time series data	
	SPS as statistical framework for quality control and improvement, monitoring HAIs, and detection of non-random variations in HAI rates caused by outbreaks or following improvement interventions	

Area 9 – Surveillance		
Differences between HAI surveillance definitions and clinical definitions for infectious syndromes		B
The role of surveillance and feedback (prospective, benchmarking) reporting		
Surveillance systems (local, regional, national, European and global)		
Use data management resources to obtain needed information and perform healthcare epidemiology and public HAI surveillance		
Validation of HAI surveillance data		
Proper selection of HAI surveillance software		
Surveillance in special areas		
	Surveillance in the intensive care unit	
	Surveillance of surgical site infections	

	Surveillance of C. difficile infections	A
	Surveillance of antimicrobial resistance	
	Surveillance of antimicrobial consumption	
Performing point prevalence surveys of HAI and antimicrobial use		
Comparison of surveillance data across institutions/settings and against population-based data sets		

Area 10 –Meta-competence and European competence			
Meta-competence			A
	Interdisciplinary teamwork, including role-play and case studies		
	Communication skills, including role-play and case studies		
	Team-efficiency; group dynamics		
	Leadership abilities		
	Regional IC		
		Assessment of regional healthcare (infra)structure	
		Analysis of patient transfer patterns	
		Establishment of regional prevention networks	
		Basics of collaboration with regional stakeholders	
		Regional surveillance and data sharing	
		Regional outbreak control	
European Competence			
	Intercultural competence		
	Culture-based differences in use of antibiotics and IC measures		
	Language competence		
	Evidence-based IC		
	Evidence-based solution finding		
	Differences in ID epidemiology and pathogen and vector reservoirs		
	Differences in European healthcare systems		
		Healthcare structures	A
		Healthcare economics	
		Vaccination policies	
	Differences in research focus		
	Differences in ASP		

Area 11 – Technical hygiene – methods and assessments		
Ventilation and air-conditioning systems in health-care settings		A
	Planning, installation, and safe operation	
Water systems in healthcare institutions		
	Planning, installation, and safe operation	
	Bacterial filter systems	
	Water-borne diseases (e.g. legionellosis)	
	Risk analysis and risk regulation	
	Development of a water safety plan	
IC implications of construction and construction measures in healthcare institutions		
	Design and function of key areas such as the ICU, operating theatre and sterilization department	
	Monitoring and planning of spatial and organizational concepts for construction of new facilities	
	Building hygiene, i.e. ensuring compliance with hygiene standards when construction takes place without stopping regular services and operations	
	Coordination between supervisory authorities and all individuals involved in construction works	
	Final assessment of finished construction, including a detailed hygiene inspection report	
Decontamination and sterilization of medical devices		

EUCIC Infection Prevention and Control Certificate: a 2-year European Training Programme

1. Programme overview

The programme has a duration of 2 years and is open to all medical doctors and those with an MSc or PhD who are pharmacists, nurses or other healthcare professionals.

It consists of 12 compulsory activities:

1 **basic module** (optional for CM, ID, HH/IC specialists), which lasts for 4-6 days

6 **advanced modules**, each lasting 1 to 2 days

3 **local modules** or **observerships** with different duration as per centre specifications.

2 **E-learning** educational activities

Modules are provided in specialized centres across Europe. For an overview of all centres taking part in the programme, please see the figure below.

2. Trainee requirements

Trainees who are not specialized in either CM, ID or HH/IC need to complete the basic module to be eligible to take the advanced modules. If trainees are already specialists in CM, ID, or HH/IC or public health (if the degree is a Master in Public Health in infectious diseases or equivalent), respectively, they do not need to take the basic module. The successful completion of one of these specialties is considered sufficient to

immediately take advanced level modules. It is, however, possible for specialists to take the basic module if they wish.

Registration will start in **December 2017** and the first certificates will be presented during ECCMID 2020.

Entry requirements

- Regular access to a personal computer and the internet (including basic skills in their use).
- A good command of the English language (B2 level is strongly recommended).

In case of sickness, trainees will need to provide a certificate. They will have a second opportunity to re-join the course within a 24-month period.

Evaluation

Modules can be successfully completed by obtaining a pass grade on in-class assignments, written or oral examinations, practical assignments or essays or presentations depending on the chosen module. The type of exam will be stated in the module description. All modules and the final examination (written and oral) need to be successfully completed to receive the European Infection Prevention and Control Certificate.

The final examination will be performed one day before ECCMID and the names of the successful students will be publicly announced during ECCMID. The certificate will be provided by EUCIC **(60 European credit transfer system [ECTS] estimated)**.

The programme must not take more than 3 years to complete. If a trainee is not able to finish it within this time period, they can continue the programme at an increased cost (please see tuition).

Trainees who fail the test of one particular module will be allowed to repeat the module at no extra cost or they can choose to repeat the test only after obtaining permission of the local faculty.

Tuition

The cost of tuition for the whole programme is €5000 per trainee and covers 10 modules (1 basic module, 6 advanced modules, 3 local modules). The cost of tuition for the whole advanced programme (for those who can start the training for the advanced module) is €4200 per trainee and covers 9 modules (6 advanced modules, 3 local modules). Accommodation is covered only for the basic course. Travel costs are not included in the fee. After registration, trainees can also choose to pay per module. Prices differ per module and can be found in the module descriptions.

The best performing graduate will be honoured at ECCMID and receive a full tuition refund.

If trainees take longer than three years to complete the programme, they will need to pay 25% of the full costs of each missing module.

3. Module providing centres

The programme will run at **EUCIC excellence sites**, which provide the basic and advanced modules in English (mandatory), and **EUCIC training sites**, which provide modules in local languages or in English.

Based on course availability, single modules will also be open to trainees not enrolled in the certification programme.

For more details on excellence and training sites see the website.

4. Programme schedule and content

Basic module

The basic module will take place in Groningen from 25 February to 02 March 2018 and covers the following topics:

- Epidemiology and transmission of antibiotic resistance
- Microbiological diagnostic skills
- Interventions to improve infection prevention and control
- Epidemiology and surveillance of healthcare associated infections
- Practical infection prevention control skills
- Infectious diseases and appropriate infection prevention and control

Trainees can register at the following link.
The registration fee for ESCMID members is € 795 and for non-members € 895. For EUCIC trainees the registration fee is included in the learning programme.

Advanced modules

Currently the following modules are scheduled:

- June 2018 (Paris, FR)
- October 2018 (Utrecht, NL)
- January 2019 (Freiburg, DE)
- March 2019 (Ljubljana, SI)
- May 2019 (Geneva, CH)

- September 2019 (Vienna, AT)
- April 2020: Final examination at ECCMID and announcement of the graduates

For more details on the topics of the modules (including local modules and observerships), please see below. Further details on the contents of each module will follow shortly.

Basic and Advanced modules

Name of the module	Date	Type of module	City	Country	Module coordinators
EUCIC basic module	25 February – 2 March 2018	Basic	Groningen	Netherlands	Alex W. Friedrich
Surveillance and early warning systems of healthcare-associated infections	4-6 July 2018	Advanced	Paris	France	Pascal Astagneau
Epidemiology and data analysis in infection control	24-27 October 2018	Advanced	Utrecht	Netherlands	Jan Kluytmans
Dynamics of disease transmission: from genomes to infection control	14-16 January 2019	Advanced	Freiburg	Germany	Hajo Grundmann, Sandra Reuter, Nico T. Mutters
Antimicrobial stewardship	13-15 March 2019	Advanced	Ljubljana	Slovenia	Tatjana Lejko Zupanc
Science of implementation in infection control	May 2019	Advanced	Genève	Switzerland	Didier Pittet, Walter Zingg
Technical hygiene	13-14 September 2019	Advanced	Vienna	Austria	Elisabeth Presterl

Local modules

Major topic of the local module	City	Country	Module coordinators
Antimicrobial therapy and stewardship	Zagreb	Croatia	Ana Budimir
Antimicrobial therapy and stewardship	Porto	Portugal	Nuno Rocha-Pereira
Biofilm-driven infections: research and clinical relevance	Bucharest	Romania	Oana Sandulescu
Carbapenem resistance control in Israel	Jerusalem	Israel	Nir-Paz Ran
Development and implementation	Bergamo	Italy	Annibale Raglio
Epidemiology and surveillance	Berlin	Germany	Petra Gastmeier
Implementation of surveillance	Heraklion	Greece	Achilleas Gikas
Implementation science and management	Senhora da Hora	Portugal	Isabel Neves
Infection control in high-risk patients	Genova	Italy	Claudio Viscoli
Meta-competence and European competence	Loures	Portugal	Carlos Palos
Microbiological diagnostic skills	Athens	Greece	Athanassios Tsakris

Practical infection control skills	Loures	Portugal	Carlos Palos
Surveillance and meta-competence	Nicosia	Cyprus	Constantinos Tsioutis
Technical hygiene	Tamworth	England	Nick Read
Technical hygiene	Regensburg	Germany	Wulf Schneider

E-learning modules

E-learning usually includes case presentations (~8/10 ECTS) and/or webinars (~1/10 ECTS) and /or videos (~1/10 ECTS) covering basic and advanced aspects of IPC. The type and number of e-learning activities will be evaluated every year. At least 80% of all e-learning materials need to be completed by the trainees; e-learning will also earn ECTS points. Specific (optional) e-learning events will be organized on “hot” or “emergency” topics. All materials will be available to trainees on the EUCIC website.

Observerships

City	Country	Coordinators
Sofia	Bulgaria	Rossitza Vatcheva-Dobrevska
Zagreb	Croatia	Ana Budimir, Rok Civljak
Tel Aviv	Israel	Yehuda Carmeli, Mitchell Schwaber
Verona	Italy	Evelina Tacconelli
Athens	Greece	Athanasios Tsakris
Crete	Greece	Achilleas Gikas
Cluj Napoca	Romania	Mihaela lupse
Lasi	Romania	Doina Azoicăi, Mioara Matei
Timisoara	Romania	Voichița Elena Lăzureanu
Brasoy	Romania	Andreea Moldovan
Barcelona	Spain	Juan Pablo Horcajada
Sevilla	Spain	Jesús Rodríguez-Baño
Ankara	Turkey	Murat Akova
Kiev	Ukraine	Aidyn Salmanov

5. Contact information

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