# Of an Accredited Postgraduate Fellowship Program in Medical and Public Health Laboratory Microbiology

# ESTABLISHED BY THE SUBCOMMITTEE ON POSTGRADUATE EDUCATIONAL PROGRAMS (CPEP)

# Adopted by the American Academy of Microbiology Board of Governors

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# 1. PREAMBLE

The Essentials of approved postgraduate fellowship programs in medical and public health laboratory microbiology

## 2. AND GUIDELINES FOR ACCREDITATION

#### 2.1. Sponsorship

# 2.1.1. Institutions – *Essentials*

Postgraduate fellowship programs must be established in institutions with complete clinical laboratories or reference laboratories that perform clinical and/or public health microbiology procedures in sufficient volume at an appropriate level of quality, such as:

- 1. University and other medical centers
- 2. Public health laboratories
- 3. Hospitals and clinics
- 4. Reference clinical laboratories

#### 2.1.2. Affiliates – *Essentials*

In instances where any aspect of the program cannot be provided by a single sponsoring institution, collaborative arrangements with other institutions must be established.

# 2.1.3. Accreditation – *Essentials*

In programs where the laboratory bench experience, clinical phases, and didactic instruction are provided by two or more institutions, accreditation will be granted to the sponsoring institution that assumes primary responsibility for curriculum planning and mode of instruction; coordination of the various elements of the program and guidance of individual Fellows; selection of the faculty for the program; admission and registration of Fellows; and verification of successful completion of the program. The sponsoring institution must also be responsible for assuring that the activities assigned to Fellows in the clinical laboratories are appropriately educational and not merely service work.

The sponsoring and collaborating institutions must not be the subject of an interim action by a recognized institutional accrediting agency or state agency potentially leading to the suspension, revocation or termination of its accreditation or have been threatened of a suspension, revocation or termination of its accreditation and the due process procedures required by the action have not been completed. The sponsoring and collaborating institutions must be accredited by the Joint Commission of Accreditation of Health Care Organizations, the College of American Pathologists, or the Center for Medicare and Medicaid Services, as appropriate.

#### 2.1.3.1. Guidelines

In providing a postgraduate fellowship program in medical and public health laboratory microbiology, it is necessary for one institution to assume the major responsibility for the development and management of the program. D0.9 (i)-()-12.7.001 Tcoi[(s)5.5 (,)5(e)-2.8 (c)-2.700c9 ([(s)5.867 -(n)8.1 ( a. Tc)-Pl(o)-4 Ms(i)2.9 ([1.1 (,)-4 Ms(i)2.9

practices with regard to race, color, creed, sex, age, sexual preference, national origin, or disability, in admission and treatment of students and postgraduate Fellows and in appointment and employment of staff.

# 2.1.5. Responsibilities of the Sponsor and Affiliate Institutions – *Essentials*

Responsibilities of the sponsor and each affiliate/collaborating institution for program administration, instruction, supervision, and documentation must be clearly described in written documents and made available for distribution and inspection.

# 2.2. Curriculum

# 2.2.1. Program Length – *Essentials*

The length of the program is 24 months.

2.2.1.1. Guidelines

Although the ABMM and other certification boards may give credit for partial participation in an

Major training objectives should be developed for the Fellow to identify the knowledge and skills to be acquired by the end of the two-year fellowship. In preparing objectives, the program directors should consider the *Essentials* and accompanying guidelines in Section 2.2.3.

The first year of the postgraduate training in medical and public health laboratory microbiology should be organized on a broad basis to furnish instruction in each of the specialty areas. While instruction may be provided in organized courses and self-instructional materials, practical bench exercises and training and clinical experience should be emphasized. The Fellow should have in-depth knowledge of clinical aspects of infectious diseases as they apply to laboratory diagnosis and detection of antimicrobial resistance. Fellows accepted in these programs may have had prior training in specific areas, such as microbial physiology, microbial genetics, bacteriology, statistics, pathology, or pathogenesis of infections. Therefore, the program may have to individualize training according to each Fellow's prior experience while still covering the *Essentials*.

The second year should continue broad training but at a substantially higher level with emphasis on clinical significance and interpretation of laboratory results to solve epidemiological problems and to care for patients and populations. The program must also provide training in laboratory management and experience in dealing with management of interpersonal relationships and supervisory aspects of the laboratory. Program directors should draw Fellows into the management decision-making process and provide increasing responsibility for at least some important aspects of the laboratory services. Fellows' attendance at ward rounds and clinical conferences should increase in frequency and level of participation.

To help the Fellows know whether or not an assignment or segment of the program is being adequately covered, modular or rotation objectives should be prepared for the major components of the program. The program director (or designee) should review objectives with the Fellow at the beginning of each component. The modular objectives should also help the faculty to organize content, learning experiences, and performance evaluations for various portions of the program.

If the parent institution cannot provide adequate training in certain areas, arrangements must be made for the Fellows to learn the material at other institutions and through supervised independent study.

The Fellows should have the opportunity to become acquainted with "new" infectious disease problems, epidemics of national or global concern, and major effects or trends in health care and maintenance.

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# 2.2.3.1.1. Guidelines

The Fellow should be familiar with transport devices and conditions for preserving the viability of microorganisms during a brief or extended transport period.

He/she should be able to recommend optimum blood collection procedures including number of cultures, timing of collections, volume of blood per culture, and proper antisepsis before venipuncture.

He/she should understand the use and content of the Laboratory Test Catalog/Handbook and be able to assist clinicians in the selection of appropriate tests.

The Fellow should be able to evaluate the quality of the specimen based on gross and microscopic examination of the material and apply criteria for specimen rejection.

The Fellow should be able to determine if a shipment classifies as a Category A, Category B or Exempt Human Specimen and define the packaging and shipping requirements associated with each shipment type.

2.2.3.2. Isolation and Identification – Essentials

The Fellow must be able to:

- interpret direct stains of clinical material and provide rapid results based on examination of slides prepared by various staining procedures. He/she must be able to correlate commonly used histopathology stains of tissue sections with the presence of infectious agents.
- identify test results that necessitate referral of possible biological threat and/or select agents
- communicate to and consult with clinicians regarding the clinical relevance of culture and other clinical microbiology test results.
- understand the evolution of point of care testing and its increasing impact on infectious disease diagnostics.

The Fellow must be familiar with techniques for specimen preparation and routine and reference procedures to recover bacteria, mycobacteria, fungi, parasites, viruses, and nucleic acid from clinical specimens. He/she must be familiar with procedures for the direct detection of infectious agents (antigen detectio.

The Fellow should be familiar with the antimicrobial stewardship committee, infection control committee, and epidemiology/surveillance activities with participation if possible.

# 2.2.3.4. Infectious Disease Serology and Immunology - Essentials

The Fellow must be familiar with the theory and practice of agglutination, precipitation, enzyme immunoassay, immunodiffusion, immunofluorescent, complement fixation, and immunoblotting techniques. He/she must know the application and interpretation of antibody and and antisetigen illus (30.00.000 TVd[(2).000)

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The Fellow should understand modes of transmission and acquisition of relatively common laboratory acquired infections.

Fellows should understand the principles and practices of the following safety issues:

- Composition and use of a laboratory safety manual
- Principles of biosecurity
- Standard precautions
- How to conduct a risk assessment
- OSHA requirements
- Biosafety hazards, including handling specimens potentially containing highly infectious/pathogenic organisms
- Selection and use of appropriate personal protective equipment (PPE) to include proper donning and doffing
- Waste management, including disposal of biohazard material and sharps
- Safe handling of radioactive materials
- Physical and chemical hazards, including carcinogens
- Methods of disinfection and sterilization
- Baseline medical testing (immune status, protection immunization)
- Laboratory design as it applies to safety
- Biological safety cabinets and biosafety levels
- Policy for managing laboratory accidents, including managing a safety emergency
- Regulations related to packaging and shipping infectious substances and the disposal of biohazardous materials
- Possession and transportation of select agents
- Occupational exposures
- Disaster planning/Continuity of Operations Plan (COOP)
- 2.2.3.7. Epidemiology of Infectious Disease and Hospital Infection Control Essentials

The Fellow

The Fellow

# 2.2.3.14.1. Guidelines

The Fellow should be familiar with nationally notifiable diseases as well as the reportable disease list utilized by the local public health laboratory. The Fellow should understand how the information and / or specimens that must be sent to the public health laboratory are utilized.

The Fellow should learn to identify microorganisms that cause infectious diseases of public health importance, including agents of bioterrorism.

The Fellow should be familiar with the types of outreach activities that public health entities offer (e.g. APHL teleconferences, laboratory training, etc.).

The Fellow should be familiar with the principles and logistics of the investigation of outbreaks of diseases of public health importance.

The Fellow should be able to provide professional educational assistance to other clinical/diagnostic microbiologists throughout the state and where applicable to the general public.

The Fellow should be familiar with the following public health laboratory methods:

- Potable and waste water testing
- Food and dairy microbiology
- Sexually transmitted diseases testing
- Tuberculosis testing
- Whole genome sequencing; both PulseNet and non-PulseNet methods
- Bioinformatic analysis, molecular epidemiology, and data interuCID 14 e-j-0d

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# 2.2.3.15. Molecular Diagnostics - Essentials

The Fellow must be exposed to the theory and application of

The table below lists the amount of time an individual spends in each of the major training areas during a two-year program. The minimum *Essential* or requirement times are intended for individuals who enter a program with little or no previous experience in clinical microbiology and represent the time needed to achieve the objectives stated in the *Essentials*. The ranges of time or guidelines for each area provide flexibility that may be necessary due to prior experience of the Fellow.

Essentials and Guidelines for Length of Time in Major Training Areas					
Major Training Area	<i>Essentials</i> Minimum Time Spent (Months)	Guidelines Range of Time Spent (Months)			
Bacteriology and Antimicrobial	3	3-6			
Susceptibility Testing					
Mycology	1	1-2			
Mycobacteriology	1	1-2			
Virology, Chlamydia,	1.5	1.5-3			
Mycoplasma, and Ureaplasma					
Parasitology	1	1-2			
Clinical Infectious Diseases	1	1-3			
Infectious Disease Serology and	0.5	0.5-1			
Immunology					
Public Health Microbiology	0.5	.5-2			
Infection Control	0.5	.5-2			
Management & LIS/Computer	0.5	0.5-1.5			
Training					
Molecular Diagnostics	1	1-3			
Research	Open				
Teaching	Open				

# 2.2.5. Evaluation of Instruction – *Essentials*

Programs must develop and implement means to evaluate all phases of the instruction. Performance and competence must be documented in relation to stated program objectives that are made known upon entering the program. Performance must be documented and reviewed with the Fellow. Documentation of the review must be maintained for at least seven years.

2.2.5.1. Guidelines

Because a standard curriculum for all individuals is inappropriate, the parent institution should record the bench and clinical rotations, research, organized courses, and individual study that engaged the time of each Fellow. A list of these program components and other information on Fellow activities and performance should be retained by the institution.

#### 2.3. Resources

# 2.3.1. General Resources – *Essentials*

Resources, as described below, must be adequate to support the number of Fellows admitted to the program.

#### 2.3.1.1. Guidelines

Care should be taken to ensure that the supervisory and instructional staff and other resources are available for all Fellows enrolled in the program and are adequate to provide quality instruction for this advanced, professional level of training.

# 2.3.2. Program Staff – *Essentials*

The program must have a qualified program director(s) and adequate support staff. The program director must assume overall responsibility. When the program director is changed or is on leave for longer than one month, CPEP must receive immediate notification. The interim/acting director is responsible for all components of the program. The curriculum vitae of the new director, giving details o B419 (ed8 (f)2 (Ce 0.004 Tw 3[0.0)5 (training,banklexpittichtorPEP) for inspection and approval by the committee. If the

new director's credentials are in order, accreditation of the program will be continued.

# 2.3.2.1 Guidelines

Primary responsibilities o (B6 (t)-12.1 (0)5 (e)]TJ0 Tc 0 Tw 12.133 0 Td()Tj0.004 Tc -0.004 Tw 0.253 0 Td[(p)-2 (ro)-2 (g)10 (ra)2.2 (m)]TJ0 T

The program director must be (a) a medical microbiologist who holds a responsible leadership position in the sponsoring institution and (b) certified (with active status) as a Diplomate by the American Board of Medical Microbiology (ABMM). The program director may be certified by another board that is acceptable to CPEP, provided the program has a deputy director at the sponsoring institution who is certified (with active status) by the ABMM. The program director must be engaged full time in microbiological work (diagnostic, research, teaching, program administration) at the sponsoring institution.

#### 2.3.5. Assistant or Deputy Program Director Qualifications – *Essentials*

If the program has a designated assistant or deputy program director, he/she must be certified by the ABMM or a board that is acceptable to CPEP and the certification must be active. The assistant or deputy program director(s) must have appropriate credentials that are acceptable for faculty appointments at the sponsoring and/or collaborating institutions.

# 2.3.6. Instructional Staff

2.3.6.1. General Qualifications - Essentials

All instructional staff must be qualified through academic preparation, experience, and appointment to e.9 (-2.3)-1 (ow3(r)-2.2.8 (l9 (c p)-4 (r)9.7 (o)-4glh,)-qis)2.5 (t3 (n)8 (Tc 0 Tw47.277 0 Td()Tj0.002 Tc 0.001 Tw 0.253 0 Tc

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The financial resources of the sponsoring institution must be such that continued operation of the educational program is assured for completion of the program by current and newly accepted Fellows.

#### 2.3.7.1. Guidelines

In addition to adequate budgetary support for the teaching and diagnostic operations of the laboratory, adequate stipend support for Fellows should be provided.

#### 2.3.8. Physical Resources – *Essentials*

Adequate laboratories, classrooms, office space, computer resources, and other facilities must be provided.

# 2.3.8.1. Guidelines

The laboratories should have sufficient space to accommodate both the staff and Fellows without interfering with the regular activities of the laboratory. A separate office(s)/laboratory area for Fellows is desirable.

### 2.3.9. Equipment and Supplies – *Essentials*

Appropriate, modern equipment and supplies in sufficient quantity must be provided.

## 2.3.9.1. Guidelines

Institutions lacking state-of-the-art automated instruments and computer facilities should make Fellows aware of such technology by having them rotate through other institutions and/or attend lectures and workshops dealing with these subject areas. Adequate instructional materials should be available, including microorganisms and clinical materials that are not available on a regular basis. Programs should also maintain self-instructional materials such as collections of color images, movies, and digital media to supplement the instruction available in the program.

# 2.3.10. Library – *Essentials*

A library must be readily accessible and contain an adequate supply of up-to-date books, journals, and reference materials related to the curriculum. Computerized search services must be available, and the Fellow must be trained in their application and use.

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frequent meetings may be necessary to resolve certain issues that arise during the year. Minutes of these meetings must be prepared and submitted to CPEP with the annual report.

#### 2.3.12.1. Guidelines

The advisory committee should be relatively small, consisting of the program director, one or two of associates at the sponsoring institution, and one representative from each collaborating institution. One of the more senior Fellows in the training program may also serve.

#### 2.4. Fellows

#### 2.4.1. Program Description – *Essentials*

Prospective Fellows must be provided with a clear description of the program and its contents, including the program objectives and competencies that the Fellows are expected to attain. There must be no deceptive publicity concerning job placement or income expectations for Fellows. Fellows must be given a copy of the CPEP *Essentials* upon entering the program, if not before.

The program must have a printed document that clearly describes the training program that is offered. Additional information on stipend, travel, health insurance, and scheduled time off must be disclosed in writing to each Fellow.

#### 2.4.2. Admission – Essentials

The Fellow must have earned a doctoral degree (such as Ph.D., M.D., D.O., Sc.D., Dr. P.H., and D.V.M.) with graduate education in microbiology or molecular biology to qualify for admission to the training program. At this time, Doctorates of Clinical Laboratory Sciences (DCLS), Pharmacy (PharmD) or Health Sciences are not acceptable for admission to a CPEP-accredited program. Fellow recruitment and selection must be nondiscriminatory with respect to race, color, creed, age, sex, sexual preference or national origin; appropriate consideration must be given to the physically handicapped. Matriculation practices must be consistent with all applicable laws regarding nondiscrimination. The decision for selecting a Fellow must be documented in writing and retained for seven years.

#### 2.4.2.1. Guidelines

Educational prerequisites, other criteria for selection, and the method of selection should be explained to prospective candidates. Desirable prerequisites for the postgraduate training programs include courses in epidemiology, immunology, microbiology, molecular biology, histology, pathogenesis of infection, and statistics. Previous work experience in medical and/or public health diagnostic laboratories may be considered when evaluating candidates for the program.

A fellowship selection committee consisting of two, and preferably three, members should participate in the selection process. It is usually desirable to have members of the advisory committee serve on the selection committee. If possible, all members of the fellowship selection committee should interview candidates. Current Fellows should have the opportunity to meet with prospective candidates and answer their questions on all phases of the program.

Documentation of the selection process and the decision to select a candidate may consist of the minutes from the meeting of the Selection Committee. These written minutes should be retained for a period of seven years.

#### 2.4.3. Benefits and Scheduled Time – *Essentials*

Fellows must have available the following benefits equivalent to those received by other postgraduate residents, Fellows, interns, and employees at the institution:

- The option to participate in health and hospitalization insurance programs
- Customary leave, vacation, and holidays
- Eligibility for sick leave, maternity leave, and childcare

The program must be educational, and the Fellows must use their scheduled time for educational experiences. The laboratory diagnostic work performed by the Fellows must be primarily for the purpose of developing competency rather than to provide routine diagnostic services.

2.4.3.1. Guidelines

Exceptions to this *Essential* may be necessary to provide emergency services for brief periods. The Fellows may assume other managerial, supervisory, and professional responsibilities as assignments to meet the training objectives of the program.

# 2.4.4. Health and Safety – *Essentials*

The program director must assure that the Fellows' **Esa**lth and safety is(protected by app) oprize tr4 Ef4sws()Tj0.002 T5.072GGtss sFsEs80.6.ng0 T3..1 a•212.(ng0 2 (81 Every attempt should be made to resolve the Fellows' complaints and concerns within the department or within the institution. A more formal appeal mechanism is available through CPEP. Details of this process are described in the *Operational Procedures* of CPEP which may be obtained from a program director or the ASM website.

#### 2.4.8. Withdrawal or Termination – *Essentials*

Policies and procedures for Fellow withdrawal or termination must be fair, published, and made known to all applicants. Written documentation of any disciplinary action must be included as part of the Fellow's record and included in the permanent record forwarded to CPEP.

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1. The educational program is not maintained in substantial compliance with the *Essentials* and the *Operational Procedures* of CPEP.