

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY



This document comprises a discipline-specific version of the general competence document and provides additional guidance as to how to complete the general document, Appendix 1 of the Guidelines, that you must submit with your application.

Remember that the aim of the process is for the candidate to satisfy the assessor that he or she has the appropriate basic qualifications and length of experience for issue of the Certificate of Attainment, and that the training programme/period of supervised practice has enabled the candidate to achieve the basic level of competence required for registration as a clinical scientist.

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|--|---|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| | GENERIC COMPETENCES | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 1-SCIENTIFIC | Be able to demonstrate the rigorous application of scientific methods in his/her experience to date |
| 3a.1 | <ul style="list-style-type: none"> understanding the science that underpins the specialty (modality) and the broader aspects of medicine and clinical practice | <ul style="list-style-type: none"> must understand the principles of the techniques and methods employed in the discipline must be able to advise on choice of samples and aspects of preparation of the patient relevant to the discipline must be familiar with the evidence for, and limitations of, the common procedures relevant to the discipline used in the diagnosis and management of patients must have a basic knowledge of related disciplines in order to be able to integrate relevant diagnostic results into an interpretation must be familiar with information on developments and needs in the discipline |
| 3a.1 | <ul style="list-style-type: none"> demonstrating a strong base of knowledge appropriate to the specialty and to the investigations and therapeutic options available | |
| 2b.1 | <ul style="list-style-type: none"> experience of searching for knowledge, critical appraisal of information and integration into the knowledge base | |
| 2b.4 | <ul style="list-style-type: none"> ability to apply knowledge to problems associated with the routine provision, and development, of the service | |
| 2a.1 | <ul style="list-style-type: none"> ability to identify the clinical decision which the test/intervention will inform | |
| 2a.3, 2c.1 | <ul style="list-style-type: none"> ability to make judgements on the effectiveness of procedures | |
| 2a.2 | <ul style="list-style-type: none"> application of the knowledge base to the specialty (modality) and to the range of procedures/investigations available | |
| | | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> an understanding of the wide variety of methods employed in the practice of clinical microbiology a critical understanding of the application of investigative protocols and diagnostic tests in clinical microbiology a critical understanding of the integration and interpretation of clinical microbiology parameters with other diagnostic parameters (haematological, clinical biochemistry, imaging etc) in the overall clinical assessment of the patient a critical understanding of scientific method and the tools required to successfully evaluate, develop and/or modify both current and emerging technologies as routine diagnostic tools in clinical microbiology developed research skills and expertise sufficient to support supervised and collaborative research initiatives in clinical microbiology and with clinical medicine | |
| <i>Achieved through:</i> | <ul style="list-style-type: none"> an approved postgraduate degree course and/or seminar programme and participation in appropriate ACM and related training programmes the presentation of outcomes of method evaluations, protocol development and clinical research initiatives of a standard suitable for publication participation in local research meetings and evidence of supervised and collaborative research initiatives, potentially leading to PhD | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisors (usually a registered Accredited Specialist) and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|---|---|--|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| | GENERIC COMPETENCES | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 2-CLINICAL | Be able to demonstrate the following relevant to the contribution of his/her specialty to patient care: |
| 2a.4, 2b.2, 2c.1 | <ul style="list-style-type: none"> ability to provide interpretation of data and a diagnostic (therapeutic) opinion, including any further action to be taken by the individual directly responsible for the care of the patient | <ul style="list-style-type: none"> must understand the underlying mechanisms of the pathology of infection must have sufficient 'clinical knowledge' to communicate effectively with clinical and other professional colleagues must be able to advise on appropriate samples and appropriate tests for specific clinical situations must be able to interpret results from range of tests relevant to the discipline taking particular account of other clinical information available must be able to contribute to monitoring of patients as appropriate for specific specialty within clinical microbiology |
| 2b.3, 3a.1 | <ul style="list-style-type: none"> understanding of the wider clinical situation relevant to the patients presenting to his/her specialty | |
| 2b.3 | <ul style="list-style-type: none"> ability to develop/devise an investigation strategy taking into account the complete clinical picture | |
| 1a.5, 3a.2 | <ul style="list-style-type: none"> understanding of the clinical applications of his/her specialty and the consequences of decisions made upon his/her actions/advice | |
| 3a.2 | <ul style="list-style-type: none"> awareness of the evidence base that underpins the use of the procedures employed by the service | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> a general understanding of clinical medicine and the effects of infection an understanding of antimicrobials available, therapeutic options and drug interactions in specific clinical situations an understanding of clinical laboratory protocols appropriate for specific clinical needs | |
| <i>Achieved through:</i> | <ul style="list-style-type: none"> an approved postgraduate degree course, short courses and seminar programme self endeavour, through literature awareness, essays and tutorials with nominated and local supervisors participation in clinical audit, case presentations, attendance at grand rounds and word rounds, clinical report evaluation | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisors and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|--|--|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| GENERIC COMPETENCES | | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 3-TECHNICAL | Be able to demonstrate the following, relevant to the modality or area of specialisation in which he/she wishes to be recognised |
| 3a.2 | <ul style="list-style-type: none"> understanding of the principles associated with a range of techniques employed in the modality | <ul style="list-style-type: none"> must be proficient in the commonly used techniques in the discipline must be able to interpret quality control and quality assurance data and take appropriate action must be able to use knowledge of underlying technical principles to resolve problems associated with methods, samples, reagents or limitations must understand underlying principles and practice with respect to health and safety aspects of work |
| 2b.4 | <ul style="list-style-type: none"> knowledge of the standards of practice expected from these techniques | |
| 2b.4 | <ul style="list-style-type: none"> experience of performing these techniques | |
| 2b.4 | <ul style="list-style-type: none"> the ability to solve problems that might arise during the routine application of these techniques (troubleshooting) | |
| 2c.1, 2c.2 | <ul style="list-style-type: none"> understanding of the principles of quality control and quality assurance | |
| 2c.1, 2c.2 | <ul style="list-style-type: none"> experience of the use of quality control and quality assurance techniques including restorative action when performance deteriorates | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> an ability to perform technical procedures as detailed in ACM Training Manual to the required standards of an operational protocol as defined for the purposes of laboratory accreditation under CPA (UK) Ltd or equivalent a critical ability to review results and determine significance of internal quality control and external quality assurance a detailed understanding of technical principles to facilitate trouble shooting an understanding of the hazards (biological, chemical, environmental and physical) associated with the practice of clinical microbiology, the appropriate controlling legislation (eg COSHH, RIDOR) and procedures for risk assessment | |
| <i>Achieved through:</i> | <ul style="list-style-type: none"> an approved postgraduate degree course and short courses practical instruction at bench level self endeavour, through literature awareness, essays and local tutorials and seminars nominated by local supervisors | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisors and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|---|--|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| | GENERIC COMPETENCES | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 4-RESEARCH AND DEVELOPMENT | Be able to demonstrate a training in research which should include: |
| 2b.1 | <ul style="list-style-type: none"> ability to read and critically appraise the literature | <ul style="list-style-type: none"> •must show critical appraisal of specific areas (such as new technologies) in relation to discipline of clinical microbiology •must be capable of recognising and defining problems •must be capable of making improvements to existing methods •must be able to contribute to individual or collaborative research projects •must be able to present findings in both written and oral form through reports, posters and publications, seminars and short presentations •must maintain an up to date knowledge of scientific and technical aspects of the discipline |
| 2b.1 | <ul style="list-style-type: none"> ability to develop the aims and objectives associated with a project | |
| 2b.1 | <ul style="list-style-type: none"> ability to develop an experimental protocol to meet the aims and objectives in a way that provides reliable and robust data (i.e. free of bias) | |
| 2b.1 | <ul style="list-style-type: none"> ability to perform the required experimental work ability to produce and present the results (including statistical analysis) | |
| 2b.1 | <ul style="list-style-type: none"> ability to critically appraise results in the light of existing knowledge and the hypothesis developed and to formulate further research questions | |
| 1b.4, 2b.1 | <ul style="list-style-type: none"> ability to present data and provide a critical appraisal to an audience of peers – both spoken and written | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> • knowledge of emerging technologies and their application to a clinical microbiology service, a general understanding of clinical medicine and the effects of infection • ability to conceive, design and execute an individual research project • an ability to write a concise and accurate report of research or development findings | |
| <i>chieved through:</i> | <ul style="list-style-type: none"> • a structured research project within an approved postgraduate degree • self endeavour, through report writing, poster preparation and presentation, and contribution to manuscript preparation • participation in individual research or development and audit projects | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> • the degree supervisor, the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisor and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|---|--|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| GENERIC COMPETENCES | | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 5-COMMUNICATION | Be able to communicate in both the written and spoken media to colleagues, peers and patients: |
| 1a.6 | <ul style="list-style-type: none"> ability to assess a situation and act accordingly when representing the specialty | <ul style="list-style-type: none"> must be able to communicate effectively with colleagues within the discipline and wider clinical community must be able to present findings in both written and oral form must be able to educate/train colleagues in specific areas of expertise must be capable of using modern communication media |
| 1a.6 | <ul style="list-style-type: none"> ability to respond to enquiries regarding the service provided when dealing with clinical colleagues | |
| 1a.2, 1b.1, 1b.3 | <ul style="list-style-type: none"> ability to communicate with patients, carers and relatives, the public and other healthcare professionals as appropriate | |
| 1b.3, 1b.4 | <ul style="list-style-type: none"> ability to communicate the outcome of problem solving and research and development activities | |
| 2b.1 | <ul style="list-style-type: none"> evidence of presentation of scientific material at meetings and in the literature | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> ability to communicate clearly and confidently to clinical and other professional colleagues in both formal and informal settings ability to educate others both within and outside clinical microbiology department an understanding of all aspects of information technology pertinent to service provision and support of clinical microbiology laboratory | |
| <i>Achieved through:</i> | <ul style="list-style-type: none"> a postgraduate degree, short courses and practical instruction presentations both oral and written within and outside clinical microbiology laboratory participation in local seminars, clinical audit and case presentations self-endeavour | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisors and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|---|---|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| GENERIC COMPETENCES | | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code - Clinical Scientist | 6-PROBLEM SOLVING | Be able to deal with the unexpected and thus be able: |
| 2a.2 | <ul style="list-style-type: none"> to assess a situation | <ul style="list-style-type: none"> must be aware of the operation of the service and its detail in order to recognise aberrant output must be capable of seeking and establishing relationships between independent pieces of information must be capable of utilising the knowledge base pertinent to the discipline must be able to integrate information from different sources in relation to decision making and results interpretation must be able to recognise the unusual and act appropriately |
| 1a.6, 2b.1 | <ul style="list-style-type: none"> determine the nature and severity of the problem | |
| 1a.6, 2b.1 | <ul style="list-style-type: none"> call upon the required knowledge and experience to deal with the problem | |
| 1a.6,2b.1 | <ul style="list-style-type: none"> initiate resolution of the problem | |
| 1a.6 | <ul style="list-style-type: none"> demonstrate personal initiative | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> an understanding of the significance of, and interrelationships between, individual items of laboratory data an awareness of the extent of available knowledge in clinical microbiology and an ability to employ appropriate information tools to search for, consolidate and critically examine information | |
| <i>Achieved through:</i> | <ul style="list-style-type: none"> an approved postgraduate degree course and/or short courses and seminar programme self endeavour through literature surveys and tutorials with nominated and local supervisors participation in local clinical and laboratory seminars, clinical audit and case presentations | |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> the nominated supervisor (must be grade C Clinical Microbiologist) or locally approved supervisors and also by ACM Training Committee | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | | |
|--|--|---|
| EXPERIENCE: | The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below. | |
| GENERIC COMPETENCES | | SPECIFIC COMPETENCES |
| HPC Standards of Proficiency Code – Clinical Scientist | 7-PROFESSIONAL ACCOUNTABILITY | Be able to demonstrate an understanding of management principles and techniques, including the following: |
| 1a.1 | <ul style="list-style-type: none"> Understanding of the legal and ethical boundaries of the modality, and the ethical aspects of scientific research. | <ul style="list-style-type: none"> must be able to recognise legal and ethical boundaries of the modality and practice and conduct research within these boundaries must be able to recognise the limits of his/her knowledge and skills must understand the principles of clinical governance and be able to audit, reflect on and review practice must understand the need for and basic requirements of accreditation schemes appropriate to the modality must understand the importance of effective communication with colleagues and be able to function as an effective member of a multidisciplinary team must understand the principles of appraisal and be able to supervise staff in his/her area of responsibility must participate in an appropriate CPD scheme (after completion of training) must have acquired a basic knowledge of health and safety requirements appropriate to the discipline must have acquired a basic understanding of the structure and organization of the department, and relevant financial aspects. |
| 1a.6 | <ul style="list-style-type: none"> Ability to recognise the limits of personal practice and when to seek advice. | |
| 1a.7 | <ul style="list-style-type: none"> Ability to manage personal workload and prioritize tasks appropriately. | |
| 1a.3, 1a.4, 2b.5, 2c.2 | <ul style="list-style-type: none"> Understanding of the principles of clinical governance including clinical audit, accreditation requirements relevant to the modality. The importance of confidentiality, informed consent and data security | |
| 1b.2 | <ul style="list-style-type: none"> Ability to contribute effectively to work undertaken as part of a multi-disciplinary team | |
| 1b.4 | <ul style="list-style-type: none"> Ability to supervise others as appropriate to area of practice. Understanding of the role of appraisal in staff management and development. | |
| 1a.8, 2c.2 | <ul style="list-style-type: none"> Understanding of the need for career-long self-directed learning and the importance of continuing professional development. | |
| 1a.5, 1a.8, 2b.4, 3a.3 | <ul style="list-style-type: none"> Understanding of the need for, and ability to establish and maintain, a safe practice environment. | |
| | <ul style="list-style-type: none"> Understanding of the structure and organization of the department and how it fits into the local clinical setting, General understanding of the way the modality is structured and practised in other locations within the UK. Basic understanding of the importance of financial accountability, budgetary control and resource management. | |
| <i>Achievement of:</i> | <ul style="list-style-type: none"> an understanding of the management principles and tools used in the service the ability to act as a professional and work effectively as part of a team understanding of the importance and principles of accreditation, audit, confidentiality, data security and safe working practice | |

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

CLINICAL MICROBIOLOGY

| | |
|--------------------------|--|
| <i>Achieved through:</i> | <ul style="list-style-type: none"> • a structured taught element (eg approved MSc course or approved lecture programme), participation in appropriate training programmes and local courses on general, personnel and financial management, health and safety, audit, etc • participation in local seminars and meetings, attendance at clinical audit meetings and clinical governance committees. • attendance at departmental management meetings • involvement, under supervision, in management within the laboratory • mentoring by an experienced practitioner |
| <i>Assessed by:</i> | <ul style="list-style-type: none"> • the nominated local supervisor and appropriate professional body external advisor/tutors |