MALAYSIAN MEDICAL COUNCIL

SPECIALTY-SPECIFIC REQUIREMENTS (SSR)

(GENETIC PATHOLOGY)

Prepared By:

Specialty Education Subcommittee (SEC)

of the Medical Education Committee (MEC),

Malaysian Medical Council

Approved by the Malaysian Medical Council:

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Preface

1. The Specialty-Specific Requirements (SSR) pertain to requirements within each specialty and specify the minimum requirements pertaining to the training curriculum, trainers, educational resources and head of programme.

2. The Specialty-Specific Requirements (SSR) are intricately linked to the MMC Malaysian Standards for Medical Specialist Training 2019, and the Standards and SSR must be read and applied together.

Attachment 2

Specialty-Specific Minimum Requirements for Training Curriculum (Based on Area 1.2.4 of Malaysian Standards for Medical Specialist Training) -

Genetic Pathology

Specialty-Specific Requirements (Reference Standard)	**Criteria**
1) Minimum entry requirements for postgraduate training (Standard 3.1.)	i. Fully registered with the Malaysian Medical Council with a current annual practicing certificate ii. Successful entry evaluation to programme
2) Minimum duration of training programme (Standard 1.2.4 - Table 2)	Completion of a minimum of 48 months of specialised training in the specialty programme.
3) Structure of training (rotation/modules) (Standard 1.2.4 - Table 3 & Table 4) Training overview Training	The programme should encompass rotations in General Pathology and in-depth specialised training in Genetic Pathology.

Scope/Content	**Minimum Duration (Weeks)**

<table>
<tr><td>rotation/modules and case mix</td><td>
<table>
<tr><td>General Pathology (Genetic Pathology, Medical Microbiology, Anatomical Pathology, Chemical Pathology, Hematology)</td><td>48</td></tr>
<tr><td>Medical Genetics, Genomics and Epigenomics</td><td>120</td></tr>
<tr><td>Genetic Counselling, Population Genetics, Bioinformatics, Genetic Ethics, Laboratory Quality Management System</td><td>20</td></tr>
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<tr><td>4) Assessments

(Standard 2.2.1)</td><td>Assessments should

i. Employ appropriate methods and levels that are well-aligned with learning outcomes. These include a variety of methods and tools such as written assessments, clinical assessments, supervisor's report, logbook, attendance, training attended, practice diary, research report, formative assessment, communication skills including methods appropriate to assess ethics and professionalism.
ii. Include formative and summative assessments throughout each rotation, semester, or year of study.
iii. Include clear criteria for progression to next year of study.
iv. Include an exit exam.</td></tr>
<tr><td>5) Additional requirements for completion of training

(Standard 1.2.4)</td><td>i. Completion of graduate-level research or clinical audit project.
ii. Completion of the required minimum core procedures (may include technical or interpretative skills) in the following areas:

<table>
<tr><th>Areas</th><th>Cases</th></tr>
<tr><td>Cytogenetics</td><td>300</td></tr>
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	Molecular cytogenetics	100
	Molecular genetics & cancer genetics	100
	Quality assurance	2 external quality assessment cases (in areas such as cytogenetics or molecular cytogenetics or molecular genetics)
6) List of competencies to be acquired upon completion of training (Standard 1.1.4)	i. Demonstrate knowledge and understanding in genetic pathology. ii. Analyse, interpret and correlate clinical cases to genetic pathology. iii. Critically evaluate and discuss diagnostic genetic findings with patients, family members and healthcare providers involved in patient care. iv. Conduct audit and quality assurance activities to improve genetic laboratory services. v. Identify occupational health hazards and safety requirements for the safe provision of genetic laboratory services. vi. Critically evaluate research findings and to contribute towards medical research, education and training in genetic pathology.	

Note : These criteria represent the minimum standards. Each educational programme provider may exercise their autonomy to state criteria above and beyond these minimum standards.

Attachment 4

Specialty-Specific Minimum Requirements for Training Centres and Head of Programme (Based on Areas 3-6 of Malaysian Standards for Medical Specialist Training) - Genetic Pathology		
Item No	**Specialty-Specific Requirements** (Reference Standard)	**Criteria**
4	Trainer-to-trainee ratio (Standard 3.1.3)	1:4
5	Minimum qualifications and experience of trainers (Standard 4.1.2)	i. Registered with National Specialist Register ii. Attended Training-of-Trainer course.
6	Minimum requirements for educational resources (Standard 5.1.1)	i. Physical facilities: a. Genetic laboratory b. Genetic clinic c. Seminar/ tutorial rooms d. Trainee workspace e. Computer room with internet facilities f. Library of reference books or journals (physical and/or virtual) ii. Equipment The diagnostic facilities and equipment requirement of the programme training centres must **collectively** be able to accommodate the following minimum requirement:

Equipment	Quantity
Workstations-PC with software for cytogenetic karyotyping and analysis	1
Fluorescence Microscope with FISH capturing and analysis software system	1
Extraction workstation	1
Polymerase chain reaction (PCR) thermocycler	1
Microarray	1
Genetic analyser for DNA Sequencing and multiple ligation-dependent probe amplification (MLPA) fragment analysis	1
Multiple Ligation-dependent Probe Amplification (MLPA)	1
Next Generation Sequencing (NGS) machine	1
Biosafety cabinet	1
Medical lab refrigerator 4°C	1
Medical lab freezer -20°C	1

Biomedical Freezer -80°C	1
Brightfield Microscope	1
Automated DNA Extraction Machine	1
Real-time PCR machine	1
Nanodrop spectrophotometer	1
Electrophoresis Gel System	1
Sequencer	1
Chamber Hybridization Oven Hybridization Instrument	1

iii. Case Load

The case load of the programme training centres must **collectively** be able to accommodate the following minimum requirements for each trainee:

(Note: Specimens may be shared between trainees)

Areas	**Minimum Quantity (specimens/trainee/year)**
Cytogenetics	75

		Molecular cytogenetics	25
		Molecular genetics and cancer genetics	25
7	Minimum qualifications and experience of Head of Programme (Standard 6.2.2)	i. 5 years of working experience in the field of genetics ii. Experience in administration and/or academic management	

Note: These criteria represent the minimum standards. Each educational programme provider may exercise their autonomy to state criteria above and beyond these minimum standards.