

# Master of Science in Applied BioMedicine

Overview of **Semester 1** Course Schedules (Subjected to changes)

Core course	Specialisation in Drug Discovery & Development + Infectious Diseases Management
Specialisation in Vaccinology & Immunotherapy	Specialisation in Vaccinology & Immunotherapy + Infectious Diseases Management
Specialisation in Drug Discovery & Development	
Specialisation in Infectious Diseases Management	

\*Detailed course timetable can be viewed on CANVAS after successfully enrollment

One timetable for both Full-time and Part-time students

Time Day	Monday	Tuesday	Wednesday	Thursday	Friday	
0800 - 0830						
0830 - 0900						
0900 - 0930						
0930 - 1000						
1000 - 1030	ABM5102 Vaccine development and its modern applications	MDG5246 Infectious Diseases: Principles & Research Methods		MDG5246 Infectious Diseases: Principles & Research Methods	ABM5103 Advanced technologies in immune therapeutic development	
1030 - 1100						
1100 - 1130						
1130 - 1200						
1200 - 1230	ABM5101 Applied Immunology		ABM5107 One World, One Health: Ecosystems, Animals and Us	ABM5101 Applied Immunology (Practical)  or ABM5104 Microbiome-Aging-Immunity crosstalk (Practical)		
1230 - 1300						
1300 - 1330		MDG5204 Advanced Topics in Pharmacology				ABM5103 Advanced technologies in immune therapeutic development
1330 - 1400						
1400 - 1430	MDG5229 Advanced Topics in Signal Transduction <small>(Core for students not taking capstone project)</small>	BMI5101B Advanced Biomedical Informatics	MDG5229 Advanced Topics in Signal Transduction <small>(Core for students not taking capstone project)</small>		ABM5107 One World, One Health: Ecosystems, Animals and Us	
1430 - 1500						
1500 - 1530						
1530 - 1600	ABM5003 Biomedical Innovation & Enterprise	BMI5101B Advanced Biomedical Informatics	ABM5105 Drugs used in Infectious Diseases	ABM5104 Microbiome-Aging-Immunity crosstalk	ABM5101 Applied Immunology	
1600 - 1630						
1630 - 1700						
1700 - 1730						
1730 - 1800					ABM5102 Vaccine development and its modern applications	

**TIMETABLE FOR SEMESTER I, 2024/2025**

**ABM5003 – Biomedical Innovation & Enterprise**

**Module Coordinator(s): Dr Volker Patzel**

Email : [micvp@nus.edu.sg](mailto:micvp@nus.edu.sg) :: Tel: 6516-3318

Lectures : Mondays (4pm to 6pm)

Venue : LT20

		<b>LECTURE</b>	<b>COMMENTS</b>
<b>WK</b>	<b>MONTH</b>	<b>Monday – 4pm - 6pm</b>	<b>(order of topics &amp; invited talks might change)</b>
1.	<b>Aug</b>	12 (VP) <b>Introduction</b> Biomedical Innovation & Enterprise	Commercialization of technology; biomedical sciences start-ups; IP, financing, regulatory, talent, medical devices & diagnostics vs. drug development; international competences
2.		19 (VP/LL) <b>Innovation &amp; IP management:</b> Patent filing; licensing & structuring of deals; business incubation	<b>Guest talk by Dr. Lim Liting</b> (Assistant Senior Manager, NUS-ILO): Patents & IP Management, <b>TBC</b>
3.		26 (VP/LYT) <b>Assessing technologies &amp; market opportunities:</b> Innovation & technology valuation; marketing research; business models; risk assessment & management	<b>Guest talk by Lei Ya-Ting</b> (Director of Global Alliance Management, Merck): Markets & Marketing <b>TBC</b>
4.	<b>Sep</b>	02 (VP/FT) <b>The entrepreneur:</b> Leadership qualities/skills	<b>Guest talk by Prof. Franz Theuring</b> (Charite Berlin, Co-founder TauRx): Developing the 1 <sup>st</sup> Alzheimer Drug, <b>TBC</b>
5.		09 (VP) <b>Brainstorming – Creative Idea Finding Session</b>	Allocated teams search for and propose business ideas
6.		16 (VP) <b>Presentation of a New Bio-Venture</b> Pitch deck, elevator pitch, business plan	Guidelines how to present a start-up
<b>RECESS WEEK: 21/09 – 26/09</b>			
7.	<b>Oct</b>	30 (VP) <b>Presentation of draft pitches</b>	Student teams are given 2 min to present an elevator pitch followed by discussions (not graded)
8.		7 (DT) <b>Risks &amp; challenges involved with biotech start-ups</b>	<b>Guest talk by Prof. Dieter Trau</b> (Dean School of Engineering & Director Entrepreneurship Center, Asian Institute of Technology, Thailand; Founder of AYOXXA, TipBiosystems, E3A), <b>TBC</b>

9.		14 (VP) <b>Case Report 1</b>	Guest Lecture by entrepreneur <b>TBC</b>
10.		21 (VP) <b>Capital requirements &amp; fund raising:</b> Operations, financing & exit strategies, M&A, IPO	<b>From Discovery to Invention to Innovation by VP (Founder of AVECRIS Pte Ltd)</b>
11.	<b>Nov</b>	28 (VP) <b>Case Report 2</b>	Guest Lecture by entrepreneur <b>TBC</b>
12.		04 (VP) <b>Final Pitching</b>	<b>Student presentations of elevator pitches (graded)</b>
13.		11 (VP) <b>Panel discussion:</b> “Biomedical Sciences Industry in Singapore”	<b>Panellists (Industry leaders, VCs, funding agencies) ND/TBC</b>
<b>READING WEEK: 16/11 – 22/11</b>			
<b>FINAL EXAMINATION: 29/11/24, 4pm – 5pm @ LT37</b>			
<b>VACATION: 8/12 – 12/01/2025</b>			

**Mode of Assessment:**

70% Continuous Assessment: Business plan (teamwork, 35%) and elevator pitch (team presentation, 35%)

30% Final Examination: 1 hour MCQ Quiz

<p><b>Lecturer/Coordinator:</b> Dr Volker Patzel - VP</p> <p><b>Guest Speakers:</b> Prof Dieter Trau - DT Dr. Liting Lim (LL): TBC Lei Ya-Ting (LYT) Prof. Franz Theuring (FT): TBC Biotech CEO's (ND) Panellists: ND/TBC</p>	<p><b>Instructor/TA:</b></p>
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(TBC: To be confirmed / ND: Not determined)

## BMI5101B Timetable (Semester 1, AY24/25)

Session	Dates	Topics	Content	Venue	Lecturers
Session 1	13 Aug 2024	Introduction to Biomedical Informatics	<ul style="list-style-type: none"> <li>Introduction</li> <li>History and definition of BMI</li> <li>Scope of biomedical informatics in healthcare</li> <li>Data/information/knowledge</li> <li>Data repositories for BMI</li> <li>Data life cycle management</li> </ul>	LT36, MD6 Level 3 NUS Medicine	Dr Judice Koh
Session 2	20 Aug 2024	Applications of Biomedical Informatics (I): Clinical	<ul style="list-style-type: none"> <li>Patient journey</li> <li>Clinical workflow</li> <li>Clinical information systems</li> <li>Telemedicine/Telehealth</li> <li>Coding standards for clinical/biomedical data</li> <li>Case studies</li> </ul>	Online	Dr Ling Zheng Jye
Session 3	27 Aug 2024	Data Models and Database Management	<ul style="list-style-type: none"> <li>Types of data (structured, semi-structured, unstructured, metadata)</li> <li>Types of data models (relational/document/graph)</li> <li>Relational database and SQL</li> <li>Practical session on SQL</li> </ul>	Online	Dr Judice Koh
Session 4	3 Sept 2024	Applications of Biomedical Informatics (II): Bioinformatics	<ul style="list-style-type: none"> <li>Review of molecular biology</li> <li>Genomics</li> <li>Transcriptomics</li> <li>Practical session of bioinformatic analysis using Google Collab</li> </ul>	Online	Dr Tan Kar Tong
Session 5	10 Sept 2024	Graph models	<ul style="list-style-type: none"> <li>Proteomics</li> <li>Multi-omics data integration</li> <li>Overview of Graph theory</li> <li>Graph models and analysis</li> <li>Molecular interaction networks</li> <li>Practical session on Cytoscape</li> </ul>	Online	Dr Judice Koh
Session 6	17 Sept 2024	Drug Discovery (I)	<ul style="list-style-type: none"> <li>CA1 (25 mins MCQs/MRQs)</li> <li>Drug Discovery and Development (Guest lecture)</li> <li>Drug discovery process</li> </ul>	LT36, MD6 Level 3 NUS Medicine	Dr Judice Koh Guest Lecturer: Dr Christophe Bodenreider (EDDC, A*STAR)
Session 7	1 Oct 2023	Drug Discovery (II)	<ul style="list-style-type: none"> <li>Drug Discovery and Infectious disease (Guest lecture)</li> <li>Image-based machine learning for drug screening</li> <li>Practical session on Image Analysis</li> </ul>	Online	Dr Judice Koh Guest lecturer: Dr Umayal Lakshmanan (SenzeHub)

Session 8	8 Oct 2024	Data Analytics	<ul style="list-style-type: none"> <li>• Overview of analytics</li> <li>• Data visualization</li> <li>• Descriptive/inferential statistics</li> <li>• Practical session on Excel for Descriptive statistics</li> </ul>	LT36, MD6 Level 3 NUS Medicine	Dr Judice Koh
Session 9	15 Oct 2024	Ethical, Legal and Social Implications of BMI	<ul style="list-style-type: none"> <li>• Nature of ethical reasoning</li> <li>• Ethics framework for biomedical big data</li> <li>• Privacy and legal/regulatory oversight of data use</li> <li>• Consent and anonymization</li> <li>• Ethical, legal and social implications of genetic data</li> <li>• Ethical, legal and social implications of AI/ML</li> </ul>	Online	Prof Owen Schaefer
Session 10	22 Oct 2024	AI and Machine Learning	<ul style="list-style-type: none"> <li>• Overview of AI/ML in healthcare</li> <li>• AI/ML pipeline for prediction</li> <li>• Evaluation of predictive AI</li> <li>• Explanability of predictive AI</li> <li>• Practical session with Orange</li> </ul>	LT36, MD6 Level 3 NUS Medicine	Dr Judice Koh
Session 11	29 Oct 2024	Case studies of AI in Biomedicine	<ul style="list-style-type: none"> <li>• CA2 (25 mins MCQs/MRQs)</li> <li>• Large language models in Biomedical Informatics</li> <li>• TBD</li> </ul>	LT36, MD6 Level 3 NUS Medicine	Dr Judice Koh
Session 12A	5 Nov 2024	Group Presentations (I)	<ul style="list-style-type: none"> <li>• Group presentations (10 mins presentation &amp; 3 mins Q &amp; A)</li> </ul>	LT37, MD1 Level 3 NUS Medicine 3-5pm	Dr Judice Koh Dr Tan Kar Tong
Session 12B	6 Nov 2024	Group Presentations (II)	<ul style="list-style-type: none"> <li>• Group presentations (10 mins presentation &amp; 3 mins Q &amp; A)</li> </ul>	LT37, MD1 Level 3 NUS Medicine 9-11am	Dr Judice Koh Dr Tan Kar Tong
Session 13	12 Nov 2024	Group Presentations (II)	<ul style="list-style-type: none"> <li>• Group presentations (10 mins presentation &amp; 3 mins Q &amp; A)</li> </ul>	LT37, MD1 Level 3 NUS Medicine 3-5pm	Dr Judice Koh Dr Tan Kar Tong

**TIMETABLE FOR SEMESTER I, AY 24/25**  
**Course: MSc Applied BioMedicine: ABM5101: Applied Immunology (ABM5101)**  
**Course Coordinator(s): Dr Png Chin Wen**  
 Email : micliuh@nus.edu.sg

Lectures dates/times : Mon 12-2pm (Lectures), Thurs 4-6 pm (Lectures(L1-L9)) or 12-6 pm (Practicals)

Venue : Lectures : MD4 Level 2 Seminar Room; Practical: MD4 Level 4, LS Lab9

**All lectures and practicals are physical face-to-face classes**

WK	MONTH	LECTURES: Mon: 12-2pm	LECTURES: Thurs: 4-6pm; PRACTICALS: Thurs: 12-6pm
1.	Aug	12: (L1): Overview of immunology: cells & structure of the immune system (PCW) – F2F	15: (L2) Innate immunity (PCW) – F2F (No practical)
2.		19: (L3) Cytokines & chemokines (NQQ) – F2F	22: (L4) MHC & antigen processing by the immune system (PCW) – F2F (No practical)
3.		26: (L5) Generation of antigen receptor diversity; T and B cell development (LJS) – F2F	29: CA1 (PCW) (No practical)
4.	Sept	02: (L6) Immune effector cells & T cell subsets (PCW) – F2F	05: (L7) Microbial infection & immunity (CKW) – F2F (No practical)
5.		09: (L8) B cells Immunoglobulin & complement (PCW) – F2F	12: (L9) Autoimmunity & immune deficiency (LJH) – F2F (No practical)
6.		16: CA2 (PCW)	19: Prep for Journal club (PCW)
<b>RECESS WEEK 21<sup>st</sup> Sept (Sat) – 29<sup>th</sup> Sept (Sun)</b>			
7.	Oct	30 Sept: Journal Club Group Presentation #1 (PCW) – F2F	03: Journal Club Group Presentation #2 (PCW) (No practical) – F2F
8.		07: No class	10: Laboratory Practical #1 (PCW) - F2F
9.		14: Journal Club Group Presentation #3 (PCW) – F2F	17: (No lecture & practical)
10.		21: No class	24: (No lecture & practical)
11.		28: No class	31: Deepavali holiday
12.	Nov	04: No class	07: Laboratory Practical #2 (PCW) + course summary - F2F
13.		11: No class	14: (No lecture & practical)
<b>READING WEEK (16<sup>th</sup> Nov – 22<sup>nd</sup> Nov)</b>			
<b>EXAM WEEK (23<sup>rd</sup> Nov -7<sup>th</sup> Dec)</b>			

**Lecturers:**

Png Chin Wen (PCW): [micpcw@nus.edu.sg](mailto:micpcw@nus.edu.sg)

Ni Qianqian (NQQ): [qqian.ni@nus.edu.sg](mailto:qqian.ni@nus.edu.sg)

Low Jun Siong (LJS): [lowjs@nus.edu.sg](mailto:lowjs@nus.edu.sg)

Chen Kaiwen (CKW): [kaiwen.chen@nus.edu.sg](mailto:kaiwen.chen@nus.edu.sg)

Lu Jinhua (LJH): [miclujh@nus.edu.sg](mailto:miclujh@nus.edu.sg)

**Assessments:**

CA1 (Lectures L1-L5): 25%

CA2 (Lectures L6-L9): 25%

Practical Quiz: 10%

Group Presentation: 40%

## TIMETABLE FOR SEMESTER I, AY 24/25

### Course: MSc Applied BioMedicine: ABM5102: Vaccine development & its modern applications

Course Coordinator(s): Dr Png Chin Wen

Email : micpcw@nus.edu.sg

Lectures dates/times: Mon 10-12 pm; Fri 4-6 pm, venue: MD11 auditorium

\*\*\* venue for 16<sup>th</sup> Sept: Medicine+Science Library (MSL) Collaboration Space

**All lectures are physical face-to-face classes except (L9) on 7th Oct is a recorded lecture**

Slots in blue, venue : MD4 Level 2 Seminar room – to be confirmed if required.

		LECTURE: Mon 10-12 pm	LECTURE: Fri 4-6pm
WK	MONTH		
1.	<b>Aug</b>	<b>12:</b> No class	<b>16:</b> No class
2.		<b>19:</b> No class	<b>23:</b> No class
3.		<b>26:</b> (L1) Introduction to vaccinology & modern vaccines (PCW) -F2F	<b>30:</b> (L2) Immunity & vaccines (PCW) – F2F
4.	<b>Sept</b>	<b>02:</b> (L3) Overview of vaccines and infectious diseases (PCW) – F2F	<b>06:</b> (L4) Vaccine adjuvants (LJH) – F2F
5.		<b>09:</b> (L5) Viral vectors in vaccine development (Benoit) – F2F	<b>13:</b> (L6) Overview of screening strategies for vaccine discovery (CWX) – F2F
6.		<b>16:</b> <b>Tutorial 1:</b> Patents and clinical trial databases as sources of research material (PCW/LML) – F2F @ Medicine+Science Library	<b>20:</b> (L7) Nanotechnologies in vaccines delivery methods (TW) – F2F
<b>RECESS WEEK 21<sup>st</sup> Sept (Sat) – 29<sup>th</sup> Sept (Sun)</b>			
7.	<b>Oct</b>	<b>30 Sept: CA1: Lectures tested L1-L6</b> (PCW)	<b>04:</b> (L8) Antigen design for vaccine development (PCW) – F2F
8.		<b>07:</b> (L9) Reverse vaccinology - computational & informatics approaches to vaccine discovery (Jaishree) – <b>recorded lecture</b>	<b>11:</b> (L10) Pre-clinical models & Vaccine development cycle (PCW) – F2F
9.		<b>14:</b> <b>Tutorial 2a:</b> Vaccine failures (PCW) – F2F <b>Tutorial 2b:</b> Social & economic impacts of vaccines (PCW) – F2F	<b>18:</b> <b>Tutorial 3:</b> Vaccines innovations (PCW) – F2F
10.		<b>21:</b> (L11) Guest Lecture: Vaccines and infectious disease: a clinical perspective (Dr Jolene Oon) – F2F	<b>25:</b> <b>CA2: Lectures tested L7-L10</b> (PCW)
11.		<b>28:</b> (L12) Guest Lecture: Outbreak Preparedness & Vaccines (Rukie) – F2F	<b>01 Nov: NUS Wellness Day</b>
12.	<b>Nov</b>	<b>04:</b> Group presentations #1 (PCW) <i>04: extra slot 12-2pm for Group presentations if required (PCW)</i>	<b>08:</b> Group presentations #2 (PCW)
13.		<b>11:</b> Group presentations #3 (PCW) <i>11: extra slot 12-2pm for Group presentations if required (PCW)</i>	<b>15:</b> Course summary (PCW)
<b>READING WEEK (16<sup>th</sup> Nov – 22<sup>nd</sup> Nov)</b>			
<b>EXAM WEEK (23<sup>rd</sup> Nov -7<sup>th</sup> Dec)</b>			

**Lecturers:**

- Png Chin Wen (PCW): [micpcw@nus.edu.sg](mailto:micpcw@nus.edu.sg)
- Chin Wei Xin (CWX): [micchwx@nus.edu.sg](mailto:micchwx@nus.edu.sg)
- Lu Jinhua (LJH): [miclujh@nus.edu.sg](mailto:miclujh@nus.edu.sg)
- Jaishree Tripathi (Jaishree): [jtmic@nus.edu.sg](mailto:jtmic@nus.edu.sg)
- Malleret Benoit (Benoit): [benoit\\_malleret@nus.edu.sg](mailto:benoit_malleret@nus.edu.sg)
- Tang Wei (TW): [wei.tang@nus.edu.sg](mailto:wei.tang@nus.edu.sg)
- Jolene Oon: [jolene\\_oon@nuhs.edu.sg](mailto:jolene_oon@nuhs.edu.sg)
- Ruklanthi (Rukie) de Alwis (Rukie): [rukie.dealwis@duke-nus.edu.sg](mailto:rukie.dealwis@duke-nus.edu.sg)
- Loh Mee Lan (LML): [lohmeelan@nus.edu.sg](mailto:lohmeelan@nus.edu.sg)

**Assessments:**

- CA1 (individual assessment): 20% (20 MCQs, (L1) - (L6))
- CA2 (individual assessment): 15% (15 MCQs, (L7) – (L10))
- Reflection journal/report (individual assessment): 15% (final due date = 1<sup>st</sup> Nov, 2350 hr)
- Final report (group assessment): 25% (due date 23<sup>rd</sup> Nov, 2350 hr)
- Final presentation (group assessment): 25%



**TIMETABLE FOR SEMESTER I, AY 24/25**

**Course: MSc Applied Bio Medicine: ABM5103: Advanced immune targeting drugs & technologies**

**Module Coordinator(s): A/Prof Zhang Yongliang** Email : [miczy@nus.edu.sg](mailto:miczy@nus.edu.sg)

**Lectures:** Tue: 1-3 pm; Fri : 10-12 pm ; **Venue:** MD4 Level 2 Seminar Room

		<b>LECTURES</b>	<b>LECTURES</b>
<b>WK</b>	<b>MONTH</b>	<b>TUESDAY 1-3pm</b>	<b>Friday 10-12pm</b>
1.	<b>Aug</b>	<b>13. No class</b>	<b>16. No class</b>
2.		<b>20. No class</b>	<b>23. No class</b>
3.		<b>27. (L1) Introduction to biologics in immunotherapy (ZYL)</b>	<b>30. (L2) Emerging technologies &amp; design for antibody therapy (mainly on discovery) (PAM)</b>
4.	<b>Sept</b>	<b>03. (L3) Antibodies as a therapeutic (mainly on clinical applications) (PAM)</b>	<b>06. (L4) Antibody and its application beyond therapeutics (i.e. diagnostics) (PAM)</b>
5.		<b>10. (L5) Immune checkpoint inhibitors (iCI) (ZYL)</b>	<b>13. (L6) Immunogene therapy (ZYL)</b>
6.		<b>17. (L7) Advanced technologies in immune phenotypical analysis (PH)</b>	<b>20. (L8) Cytokine therapy applications (LHY-need to find replacement)</b>
<b>RECESS WEEK 21<sup>st</sup> Sept (Sat) – 29<sup>th</sup> Sept (Sun)</b>			
7.	<b>Oct</b>	<b>01. CA1 (Lecture 1 to 8) (ZYL)</b>	<b>04. (L9) Targeting immune microenvironment for therapeutic development (LHY-need to find replacement)</b>
8.		<b>08. (L10) Single-cell technology in immune research (Jaishree) – Zoom lecture - (MD4 Seminar room unavailable)</b>	<b>11. (L11) Humanised models for research &amp; therapeutic developments I - (CCF)</b>
9.		<b>15. (L12) Humanised models for research &amp; therapeutic developments I (CCF)</b>	<b>18. (L13) Opportunities for nanotechnology in immunotherapeutic – I (TW)</b>
10.		<b>22. (L14) Opportunities for nanotechnology in immunotherapeutic – II (TW)</b>	<b>25. (L15) Biomaterial in immunotherapy (i.e. liposomes, polymers, silica) (?)</b>
11.		<b>29. Prep for CA/presentations (no class)</b>	<b>01 Nov. NUS Wellness Day</b>
12.	<b>Nov</b>	<b>05. CA2 (Lecture 9 to 15) (ZYL)</b>	<b>08. Group Presentation 1 (?)</b>
13.		<b>12. Group Presentation 2 (?)</b>	<b>15. Group Presentation 3 (?)</b>
<b>READING WEEK: 16<sup>th</sup> Nov – 22<sup>nd</sup> Nov</b>			
<b>EXAM WEEK: 23<sup>rd</sup> Nov – 7<sup>th</sup> Dec</b>			

**Assessments:**

CA1: 30%

CA2: 30%

Presentation: 40%

**Lecturers:**

Zhang Yongliang (ZYL): [miczy@nus.edu.sg](mailto:miczy@nus.edu.sg)

Paul MacAry (PAM): [micpam@nus.edu.sg](mailto:micpam@nus.edu.sg)

Chen Qing Feng (CCF): [miccqf@nus.edu.sg](mailto:miccqf@nus.edu.sg)

Tang Wei (TW): [wei.tang@nus.edu.sg](mailto:wei.tang@nus.edu.sg)

Jaishree Tripathi (Jaishree): [jtmic@nus.edu.sg](mailto:jtmic@nus.edu.sg)

Paul Hutchinson (PH): [lsipeh@nus.edu](mailto:lsipeh@nus.edu)

## TIMETABLE FOR SEMESTER I, AY24/25

### Module: MSc Applied Bio Medicine: ABM5104: Microbiome-Aging-Immunity crosstalk (ABM5104)

Module Coordinator(s): **Dr Png Chin Wen**

Email : micpcw@nus.edu.sg

Lectures : Wed (4-6pm), venue: S16-0435

Practical: **Wet lab: Thurs (12-6pm), venue: MD4 level 4, LS9 laboratory;**

**Dry lab Thurs (4-6 pm) MD4 Level 2 Seminar Room**

		LECTURE		PRACTICALS (4hrs)	
WK	MONTH	Wednesday 4 – 6pm		Thurs between 12-6 pm (vary depending on class)	
1.	<b>Aug</b>	14. (L1) Course overview and introduction (PCW)		15. <b>Practical 1 (wet lab) (PCW):</b> Venue: MD4, Level 4, Teaching lab Time: 12-4 pm Sample processing: DNA Extraction from faecal samples	
2.		21. (L2) Mucosal immunity, microbiome & aging I (PCW)		22. <b>Practical 2 (wet lab) (PCW):</b> Venue: MD4, Level 4, Teaching lab Time: 12-4 pm Sample processing: RNA Extraction from tumour tissues	
3.		28. (L3) Mucosal immunity, microbiome ageing II (PCW)		29. <b>Practical 3 (dry lab) (PCW):</b> Time: 4-6 pm, venue: MD4 Seminar room Introduction to Next Generation Sequencing & microbiome research: from experiments to graphs	
4.	<b>Sept</b>	04. (L4) Microbiome & biological aging in health and diseases (SP)		05. No practical	
5.		11. (L5) The symbiotic network: gut microbiome & the multi-organ axis (PCW)		12. No practical	
6.		18. (L6) Considerations for healthy ageing (PCW/GJM)		19. No practical	
<b>RECESS WEEK 21<sup>st</sup> Sept (Sat) – 29<sup>th</sup> Sept (Sun)</b>					
7.	<b>Oct</b>	02. (L7) Maintaining health through anti-aging strategies (PCW)		03. No practical	
8.		09. (L8) Multi-omics analysis & their applications in microbiome & aging research (PCW/CJM)		10. <b>CA (4-6pm) (PCW)</b>	
9.		16. (L9) Guest lecture: Microbiome, healthy longevity and beyond (PCW/industry)		17. <b>Practical 4 (dry lab) (PCW):</b> Time: 4-6 pm, venue: MD4 Level 2, Seminar room Data analysis	
10.		23. JC group presentation 1 (PCW)		24. <b>Practical 5 (dry lab) (PCW):</b> Time: 4-6 pm, venue: MD4 Level 2 Seminar room Group consultation for report.	

11.		30. JC group presentation 2 (PCW)	31. Deepavali holiday
12.	Nov	06. JC group presentation 3 (PCW)	07. No practical
13.		13. Summary (PCW)	14. No practical (Practical report submission due date)
<b>READING WEEK (16<sup>th</sup> Nov – 22<sup>nd</sup> Nov)</b>			
<b>EXAM WEEK (23<sup>rd</sup> Nov -7<sup>th</sup> Dec)</b>			

**Lecturers:**

Png Chin Wen (PCW): [micpcw@nus.edu.sg](mailto:micpcw@nus.edu.sg)  
 Sven Pettersson (SP): [sven.pettersson@ki.se](mailto:sven.pettersson@ki.se)  
 Goh Jor Ming (GJM): [jorming@nus.edu.sg](mailto:jorming@nus.edu.sg)  
 Chen Jinmiao (CJM): [chen\\_jinmiao@immunol.a-star.edu.sg](mailto:chen_jinmiao@immunol.a-star.edu.sg)

**Assessments:**

Reflection journal/report (individual): 15%  
 CA (Lectures tested = L1-L7) (individual): 30%  
 Practical assignment (group): 20%  
 Final group presentation: 35%

Department of Pharmacology  
Yong Loo Ling School of Medicine  
Master of Pharmacology- Drug Development and Discovery Track  
ABM 5105: Drugs used in Infectious diseases (4 MC)  
Academic Year 2024/2025 Semester 1  
Wednesday 4pm -6pm, Venue MD3 Level 2, Tiered room

Week	Date	Time	Topics	Lecturer	Venue
<i>Orientation week: Mon 5 Aug – Sat 10 Aug 2024</i>					
1	14/08/2024	4-6pm	Module Introduction 1. General Principles in Antimicrobial Therapy and history in Antimicrobial Drug Development	JS	MD3 Level 2
2	21/08/2024	4-6pm	2. Decoding Bacterial cell wall synthesis inhibitors: their development, discovery and use I	JS	MD3 Level 2
3	28/08/2024	4-6pm	3. Decoding Bacterial cell wall synthesis inhibitors: their development, discovery and use II	JS	MD3 Level 2
4	04/09/2024	4-6pm	4. Decoding Bacterial protein synthesis inhibitors: their development, discovery and use -	PP	MD3 Level 2
5	11/09/2024	4-6pm	5. Decoding Bacterial DNA and folate synthesis inhibitors: their development, discovery and use	PP	MD3 Level 2
<b>Quiz 1: Antibacterial drugs (Deadline: 17/9/24)</b>					
6	18/09/2024	4-6pm	6. Antifungal Agents: their development, discovery and use	PP	MD3 Level 2
<i>Recess Week: Sat, 21 Sep - Sun 29 Sep 2024</i>					
7	02/10/2024	4-6pm	7. Anti-protozoal and tuberculosis drugs: their development, discovery and use	JS	MD3 Level 2
8	09/10/2024	4-6pm	8. Anti-viral drugs: their development, discovery and use	WCS	MD3 Level 2
<b>Quiz 2: Miscellaneous Antimicrobial drugs (Deadline: 15/10/2024)</b>					
9	16/10/2024	4-6pm	9. Current Challenges in Antimicrobial Drug Development	TB	MD3 Level 2
10	23/10/2024	4-6pm	10. Vaccination development and challenges in implementation: using TB and Covid-19 as examples	TB / WCS	MD3 Level 2
11	30/10/2024	<i>Deepavali eve</i>			
12	06/11/2024	<i>Preparation for presentation</i>			
13	13/11/2024	4-6pm	<i>Students' presentations</i>	JS / PP	MD3 Level 2
<b>Deadline for Individual Report: 15 Nov 2024</b>					
<i>Study Week: Sat, 16 Nov – Fri 22 Nov 2024</i>					
<i>Exam Week: Sat, 22 Nov – Sat, 7 Dec 2024</i>					
<b>Exam format:</b> Presentation: 30% Quiz: 40% (2 spread across the semester; 20% each) Report: 30%					

**Course coordinator:** Assoc. Prof. Judy Sng (JS), Department of Pharmacology  
**Co-Coordinator:** Dr. Priya Paranthaman (PP), Department of Pharmacology

**Lecturers:**

Assoc. Prof. Judy Sng (JS), Department of Pharmacology  
Dr. Priya Paranthaman (PP), Department of Pharmacology  
Dr. Wong Chen Seong (WCS), Department of Medicine and NCID  
Assoc. Prof. Timothy Barkham (TB), Department of Microbiology and TTSH

## TIMETABLE FOR SEMESTER I, AY24/25

### Course ABM5107: One World, One Health: Ecosystems, Animal and Us

**Module Coordinator(s): Dr. Jaishree Tripathi**

Email : jtmic@nus.edu.sg

**Lectures : Friday 2-4pm, some Wed 12-2pm**

**Venue : MD4, L2 Seminar Room (Friday and Wednesday)**

		LECTURE		LECTURE/TUTORIAL (2 hrs)	
WK	MONTH	Friday 2-4 pm		Wednesday 12-2pm	
1.	<b>Aug</b>	<b>16.</b> (L1) Introduction: One Health concept and the triad of human health, animal health and the environment, (JT)			
2.		<b>23.</b> (L2) Factors leading to increased humans-animals-environment interaction and their effect on infectious diseases emergence and transmission of. (JT)		<b>28.</b> Tutorial: Documentary & Discussion (JT)	
3.		<b>30.</b> (L3) Emerging and re-emerging infectious diseases (EID) in the context of One Health. (JT)			
4.	<b>Sept</b>	<b>06.</b> (L4) Strategies to report, identify and prevent emerging and re-emerging infections. (JT)		<b>11.</b> Tutorial (JT)	
5.		<b>13.</b> (L5) Antimicrobial resistance and One Health (YB)		<b>18.</b> Tutorial: AMR Role Playing Activity (JT)	
6.		<b>20.</b> (L6) Environmental contamination with pathogens (YB)			
<b>RECESS WEEK: 21/09 – 29/09</b>					
7.	<b>Oct</b>	<b>04.</b> (L7) Vector-borne diseases (JT)			
8.		<b>11.</b> (L8) Zoonotic infections (JT)		<b>16.</b> Tutorial: Infection Outbreaks Case Study (JT)	
9.		<b>18.</b> (L9) Diseases in food animals (JT)			
10.		<b>25.</b> (L10) Bioethics and One Health (AJD)		<b>30.</b> Summary / Q & A	
11.	<b>Nov</b>	<b>01 NUS Well-Being Day</b>			
12.		<b>08</b> Team Presentations		<b>13.</b> Team Presentations	
<b>READING WEEK: 16/11 – 22/11</b>					
<b>FINAL REPORT SUBMISSION: TBC</b>					
<b>VACATION: 08/12 – 12/01/2025</b>					

**Lecturers:**

Dr. Jaishree Tripathi – JT

A/Prof. Yann Boucher- YB

Prof. Angus James Dawson - AJD

Academic Year: 2024/2025 Semester: 1

MDG5204 :Advanced Topics in Pharmacology (4 Unit)

Day	Date	Start Time (HHMM) 24 hour format	End Time (HHMM) 24 hour format	Description	Format	Lecturer	Venue
Tuesday	13/8/2024	1300	1500	L1 Course Overview	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Thursday	15/8/2024	1200	1400	L2 Pharmacokinetics / Pharmacodynamics I	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Tuesday	20/8/2024	1300	1500	L3 Pharmacokinetics / Pharmacodynamics II	Lecture	Dr Seng Kok Yong	MD3-02-01(Tiered Seminar Room)
Tuesday	27/8/2024	1300	1500	L4 The Brain as a Drug Target I	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Tuesday	3/9/2024	1300	1500	L5 The Brain as a Drug Target II	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Thursday	5/9/2024	1200	1400	L6 Therapeutic Targets for Neurodegeneration	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Tuesday	10/9/2024	1300	1500	L7 Therapeutic Targets for Stroke	Lecture	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Thursday	12/9/2024	1300	1500	L8 GPCRs as Drug targets	Lecture	Dr Shabbir Moochhala	MD3-02-01(Tiered Seminar Room)
Tuesday	17/9/2024	1300	1500	L9 Introduction to Cancer Biology	Lecture	A/P Gautam Sethi	MD3-02-01(Tiered Seminar Room)
Thursday	19/9/2024	1200	1400	L10 microRNA & non-coding RNA	Lecture	Dr Michelle Tan	MD3-02-01(Tiered Seminar Room)
Tuesday	1/10/2024	1300	1500	L11 Signaling Kinases	Lecture	Dr Michelle Tan	MD3-02-01(Tiered Seminar Room)
Thursday	3/10/2024	1200	1400	L12 HDAC Inhibitors in Cancer Therapy	Lecture	Dr Alan Prem Kumar	MD3-02-01(Tiered Seminar Room)
Tuesday	8/10/2024	1300	1500	L13 Monoclonal antibodies for Cancer Immunotherapy	Lecture	Dr Nurulhuda Binte Mustafa	MD3-02-01(Tiered Seminar Room)
Thursday	10/10/2024	1200	1400	L14 Cell cycle & CDK inhibitors	Lecture	A/P Uttam Surana	MD3-02-01(Tiered Seminar Room)
Thursday	17/10/2024	1200	1400	Briefing on the use of Examsoft for Final Exam	Lecture	CIT	MD3-02-01(Tiered Seminar Room)
Tuesday	22/10/2024	1300	1500	Journal Club I (Michelle Tan)	Presentation	Dr Michelle Tan	MD3-02-01(Tiered Seminar Room)
Thursday	24/10/2024	1200	1400	Journal Club II (Mitchell Lai)	Presentation	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Tuesday	29/10/2024	1300	1500	Journal Club III (Michelle Tan)	Presentation	Dr Michelle Tan	MD3-02-01(Tiered Seminar Room)
Tuesday	5/11/2024	1300	1500	Journal Club IV (Mitchell Lai)	Presentation	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)
Tuesday	26/11/2024	1300	1500	ExamSoft (Closed book 1 - 3 pm)	Exam	Dr Mitchell Lai	MD3-02-01(Tiered Seminar Room)

Remark:

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Academic Year: 2024/2025 Semester: 1

**MDG5229 :Advanced Topics in Signal Transduction (4 Unit)**

Day	Date	Start Time (HHMM)	End Time (HHMM)	Description	Format	Lecturer	Venue
		24 hour format	24 hour format				
Monday	12/8/2024	1400	1600	Introduction	Lecture	Zhang Yongliang	MD4 L2 Seminar Rm
Wednesday	14/8/2024	1400	1600	mTOR signalling pathway	Lecture	Tsai Shih-Yin	MD4 L2 Seminar Rm
Monday	19/8/2024	1400	1600	NF-kB signalling	Lecture	Gautam Sethi	MD4 L2 Seminar Rm
Wednesday	28/8/2024	1400	1600	CDK and cell cycle signalling	Lecture	Uttam Surana	MD4 L2 Seminar Rm
Wednesday	4/9/2024	1400	1600	MAPK signalling	Lecture	Zhang Yongliang	MD4 L2 Seminar Rm
Monday	9/9/2024	1400	1600	Small GTPase	Lecture	Mei Wang	MD4 L2 Seminar Rm
Wednesday	11/9/2024	1400	1600	Ubiquitination and protein degradation	Lecture	Png Chin Wen	MD4 L2 Seminar Rm
Monday	16/9/2024	1400	1600	Wnt-b-catenin pathways	Lecture	David Virshup	MD4 L2 Seminar Rm
Wednesday	18/9/2024	1400	1600	TNF signalling	Lecture	Shazib Pervaiz	MD4 L2 Seminar Rm
Monday	23/9/2024	1400	1600	Recess	Lecture	Recess	Recess
Wednesday	2/10/2024	1400	1600	Jak-STAT pathways	Lecture	Gautam Sethi	MD4 L2 Seminar Rm
Monday	7/10/2024	1400	1600	Signaling in T cell antigen recognition (I)	Lecture	Li Qijing	MD4 L2 Seminar Rm
Wednesday	9/10/2024	1400	1600	Signaling in T cell antigen recognition (II)	Lecture	Li Qijing	MD4 L2 Seminar Rm
Monday	14/10/2024	1400	1600	Inflammasome signaling	Lecture	Chen Kaiwen	MD4 L2 Seminar Rm
Wednesday	23/10/2024	1400	1600	GPCR	Lecture	Patrick Casey	MD4 L2 Seminar Rm
Wednesday	30/10/2024	1400	1600	Tutorial / Group Presentation	Tutorial	Zhang Yongliang	MD4 L2 Seminar Rm
Friday	1/11/2024	1400	1600	Tutorial / Group Presentation	Tutorial	Zhang Yongliang	MD4 L2 Seminar Rm
Wednesday	6/11/2024	1400	1600	Tutorial	Tutorial	Zhang Yongliang	MD4 L2 Seminar Rm
Friday	8/11/2024	1400	1600	Tutorial	Tutorial	Zhang Yongliang	MD4 L2 Seminar Rm

Remark:

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Academic Year: 2024/2025 Semester: 1

**MDG5246 :Infectious Diseases: Principles & Research Methods (4 Unit)**

Day	Date	Start Time (HHMM) 24 hour format	End Time (HHMM) 24 hour format	Description	Format	Lecturer	Venue
Tuesday	13/8/2024	1000	1200	Intro	Lecture	Thai Tran	Workshop Room
Thursday	15/8/2024	1000	1200	Bacteria I Origins, identification, and classification of microbial pathogens	Lecture	Yann Boucher	Workshop Room
Tuesday	20/8/2024	1000	1200	Bacteria II Methods for environmental and clinical surveillance of infectious diseases	Lecture	Yann Boucher	Workshop Room
Thursday	22/8/2024	1000	1200	Bacteria III Capsules, secretion systems, genetic approaches	Lecture	Chris Sham	Workshop Room
Tuesday	27/8/2024	1000	1200	Viruses I Animal models of disease (influenza)	Lecture	Vincent Chow	Workshop Room
Thursday	29/8/2024	1000	1200	Viruses II Function of viral proteins and their interactions with host factors (coronavirus)	Lecture	Tan Yee Joo	Workshop Room
Tuesday	3/9/2024	1000	1200	Viruses III Innate and adaptive immune responses in Dengue	Lecture	Sylvie Alonso	Workshop Room
Thursday	5/9/2024	1000	1200	Viruses IV Molecular Surveillance & Antiviral Strategies	Lecture	Tan Chee Wah	Workshop Room
Tuesday	10/9/2024	1000	1200	Parasites I Major pathogens, mechanisms of virulence, current research methods	Lecture	Jaishree Tripathi	Workshop Room
Thursday	12/9/2024	1000	1200	Parasites II	Lecture	Jaishree Tripathi	Workshop Room
Tuesday	17/9/2024	1000	1200	Fungi: Major pathogens, mechanisms of virulence, current research methods	Lecture	Yeong Foong May	Workshop Room
Thursday	19/9/2024	1000	1200	Journal club briefing	Lecture	Thai Tran	Workshop Room
Tuesday	1/10/2024	1000	1200	Oral Presentations I	Presentation	Thai Tran	Workshop Room
Thursday	3/10/2024	1000	1200	Clinical Perspectives on Resistance	Lecture	Jyoti Somani, Jia En Wu	Workshop Room
Tuesday	8/10/2024	1000	1200	Oral Presentations II	Presentation	Thai Tran	Workshop Room
Thursday	10/10/2024	1000	1200	Oral Presentations III	Presentation	Thai Tran	Workshop Room
Tuesday	15/10/2024	1000	1200	Oral Presentations IV	Presentation	Thai Tran	Workshop Room
Thursday	17/10/2024	1000	1200	Oral Presentations V	Presentation	Thai Tran	Workshop Room
Tuesday	22/10/2024	1000	1200	Debate preparation	Lecture	Thai Tran	Workshop Room
Thursday	24/10/2024	1000	1200	Debate preparation	Lecture	Thai Tran	Workshop Room
Tuesday	29/10/2024	1000	1200	Debate	Lecture	Thai Tran/Paul Tambyah	Workshop Room
Tuesday	5/11/2024	1000	1200	Research in ID Therapeutics and Prophylaxis	Lecture	Mo Yin	Workshop Room
Thursday	7/11/2024	1000	1200	CA	Continual Assessment	Thai Tran	Workshop Room
Tuesday	12/11/2024	1000	1200	Field Trip to NUH Medical Investigational Medicine Unit	Lecture	Thai Tran	Workshop Room
Thursday	14/11/2024	1000	1200	Field Trip to NEA mosquito production facility	Lecture	Thai Tran	Workshop Room

Remark:

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