



UNSW
A U S T R A L I A

Medical Sciences
Medicine

PATH 3208

CANCER SCIENCES

SESSION II, 2016

(6 UOC)

CRICOS Provider Code 00098G

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Please read this manual/outline in conjunction with the following pages on the

[School of Medical Sciences website:](#)

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at <http://medicalsciences.med.unsw.edu.au/>)

Course Introduction

Cancer Sciences Course (PATH3208) is an undergraduate course for 3rd year students. It is run jointly by the Prince of Wales Clinical School (Adult Cancer Program of the Lowy Cancer Research Centre), the School of Medical Sciences (SoMS), and the School of Biotechnology and Biomolecular Sciences (BABS). It aims to help students develop an integrative ability including independent research capability through professional, career and ePortfolio learning, so as to set up a bridge between scientific studies and research practice. It suits all research students, and in particular candidate honours students.

Course Administration

Administrative and general problems related to attendance, or the content and conduct of the course, can in the first instance be addressed by consulting the course convenor.

Course Convenor

A/Prof Jia-Lin Yang (Convenor): E-mail: j.yang@unsw.edu.au

Course Student Advisor

Ms Carmen Robinson

Student Advisor, School of Medical Science

BSB Student Office, Room G27, Ground Floor, Biological Sciences Building

Email: Carmen.Robinson@unsw.edu.au

Phone: 9385-2464

Students wishing to see their tutors or other members of staff should call in at the BSB (BABS/SOMS/BEES) student office and make an appointment with the student support staff.

If students have difficulties of a personal nature, they should contact the School of Medical Science Grievance Officer

Course Details

This course is offered during session II and has six unit of credit (UOC).

It will involve both individual and group work components related to the development of experimental strategies in cancer research. Group work contributes 30% of all assessment items.

Successful completion of at least 18 UOC from any Level 2 subjects offered by the Faculty of Science or Faculty of Medicine in this or other universities (domestic or overseas) is a prerequisite for enrolment to the course. Given the strong research focus of this course, there is no specific need for prior completion of Stage II or III subjects in Pathology.

Course staff

A/Prof **Jia-Lin Yang** (Course Convenor; Sarcoma and Nano-oncology Group Leader, ACP, LCRC, POWCS)

School of Medical Sciences

Dr **Darren Saunders** (Senior Lecturer, SoMS)

School of Biotechnology and Biomolecular Sciences

Prof **Marc Wilkins** (Director of NSW System Biology Initiative, BABS)

Dr **Helen Speirs** (Centre Manager, Ramaciotti Centre for Genomics, BABS)

Prince of Wales Clinical School

Prof **Phillip Crowe** (Head of POWCS, Chairman of Surgery, POWH)

Prof **David Goldstein** (Medical Oncologist, POWCS)

Prof **Paul Thomas** (Medical Oncologist, POWCS)

A/Prof **Michael Jackson** (Head of Radiation Oncology, POWCS)

A/Prof **Claire Vajdic** (Centre for Big Data Research in Health, Medicine)

A/Prof **Kerrie McDonald** (Cure Brain Cancer Neuro-Oncology Group Leader, ACP, LCRC)

Dr **Anchit Khanna** (Peter Doherty Research Fellow, SCRG, ACP, LCRC)

Dr **Anthony Don** (Senior lecturer, Bioactive Lipid Signalling Group Leader, ACP, LCRC)

Dr **Carl Power** (Head of Biomedical Resources and Imaging Laboratory, LCRC)

Dr **Barbara-Ann Adelstein** (Health Services Research, POWCS)

Dr **Jason Wong** (Senior Lecturer, Bioinformatics Group Leader, ACP, LCRC, POWCS)

Dr **Jeremy Henson** (Cancer Cell Immortality Group Leader, ACP, LCRC, POWCS)

Dr **Sheri Nixdorf** (Cure Brain Cancer Neuro-Oncology Group, ACP, LCRC)

Dr **Melvin Chin** (Medical Oncologist, POWCS)

Dr **Craig Lewis** (Medical Oncologist, POWCS)

Ms **Meg Schneider** (Chief Radiation Therapist, POWCS)

Mr **George Saade** (Educator Radiation Therapist, POWCS)

Dr **Shing Wong** (Surgical Oncologist, POWCS)

Dr **Stephen Thompson** (Radiation Oncologist, POWCS)

Mr **Simon Downes** (Director of Medical Physics, POWCS)

Dr **Phoebe Phillips** (Pancreatic Cancer Research Group Leader, ACP, LCRC)

Dr **Vivien Chen** (Coagulation in Cancer Group Leader, ACP, LCRC)

Dr **Robert Rapkins** (Cure Brain Cancer Neuro-Oncology Group, ACP, LCRC)

Ms **Weini Samuel** (ACP Manager, LCRC)

Guest Lecturers/Instructors/tutors

Prof **Martina Stenzel** (Head, Centre for Advanced Macromolecular Design)

Dr **Caroline Ford** (Metastasis Research Group Leader, ACP, LCRC, School of Women and Children's Health)

Dr **Renee Whan** (Head of Biomedical Imaging Facility)

Dr **Luke Hesson** (Adjunct Senior Lecturer, POWCS)

Course Aims

Students will be exposed in a 'scientist-based' integrative professional, career and ePortfolio learning environment. This gives students an 'apprenticeship' in becoming scientists. Students are encouraged to think and act like a scientist, to become a professional or scientific inquirer in the field through learning scientific concepts and techniques. Students will construct a basic knowledge of cancer biology, including aetiology and risk factors in its interdisciplinary context through curricular and co-curricular learning. They will also learn the scientific rationale underpinning current and future practices in cancer management (diagnosis and treatment), and the concept of 'personalised' cancer medicine. At the same time, students will develop an understanding of modern experimental approaches to important questions in common cancers. This will include coverage of the design, measurement and evaluation of translational cancer studies and clinical trials.

A fundamental aim of this course is for students to build an understanding of, and a disposition towards the career opportunities of a scientist, through curriculum and co-curriculum integrative learning activities. Students will identify relevant career goals, and how to accumulate and present evidence of achievement in pursuing these goals through the form of an ePortfolio using an ePortfolio software and Moodle systems. Students will be guided to develop the skills to create an individual ePortfolio, which will be a student's own work. Students will select a professional design theme, select and present content, obtain feedback from others, write reflective statements, and use these resources for the tailored cover letter and resume assignment. The ePortfolio will eventually be submitted for assessment.

This course specifically focuses on the design, measurement and evaluation of research projects in the field of human cancer. For those wishing to pursue a career in basic or clinical cancer research, the course will emphasise experimental approaches to cancer aetiology, as well the translational research strategies that use knowledge of cancer biology to improve diagnosis and management of that disease. Similarly, for those who may wish to pursue a career in the health sciences, the course will provide an understanding of cancer research and research methods.

Research Opportunities

Opportunities exist for all students wishing to undertake undergraduate and postgraduate cancer research program within the Faculty of Medicine. Information on the research interests of different staff members involved in the course is available through the UNSW Research Gateway (<http://research.unsw.edu.au/>).

Details of the different research units in the Adult Cancer Program of Lowy Cancer Research Centre is available on the website (<http://powcs.med.unsw.edu.au/research/adult-cancer-program>), while information on staff and research groups within the School of Medical Sciences can be found at <http://medicalsciences.med.unsw.edu.au>.

Students are also encouraged to communicate with invited guest lecturers that are active in research and clinical practice.

Student Learning Outcomes

At the completion of this course a successful student will be able to:

1. Describe causes and risk factors for common cancers, and relate these to known pathogenetic mechanisms.
2. Describe current approaches to the diagnosis and treatment of common cancers.
3. Describe research techniques and experimental strategies that are commonly used in both basic and clinical cancer research.
4. Describe how to measure and evaluate common experimental strategies or clinical studies in the field of cancer.
5. Work independently to identify and critically analyse articles from the current cancer research literature.
6. Work as part of a team to identify a valid research question in the field of cancer, and frame it within the context of existing literature.
7. Work as part of a team to design and document a research strategy that will potentially answer that question.
8. Present cancer research questions and research strategies to their peers.
9. Effectively assess research presentations made by their peers.
10. Develop evidence of achievement in relevant career goals, and record this evidence in a personal ePortfolio.

Learning and Teaching Rationale

The intended learning outcomes are achieved through active participation as well as drawing on knowledge of students in a range of areas, including anatomy, pathology, histology, biochemistry, molecular and cellular biology and statistics.

This course has strong self-directed learning approaches, but also emphasises a collaborative, team-based approach to learning and assessment. Students will be encouraged to utilise their allocated teams as study groups. These strategies are designed to assist students in developing the skills that they will need as future members of a multidisciplinary research team, particularly in the setting of translational cancer research institutes, hospital-based cancer diagnostic laboratory and clinical trials organisations.

Teaching Strategies

The course employs a variety of teaching modes in order to facilitate student learning. These include:

1. A series of 27 lectures (27 hours in total) that introduce key concepts and research techniques, as well as research project design, measurement and evaluation.
2. Four whole class tutorials (8 hours in total) will introduce the ePortfolio and how to use the supporting software. This software will be used to set up a personal ePortfolio, create a cover letter and baseline resume as well as to write tailored resumes/cover letters for specific job advertisement, and explore career options and employability development.

Four 2-hour small group tutorials with specialists facilitating (1 hour each time) that extend and amplify students' understanding of concepts and material presented in lectures, followed by 1 hour compulsory student group meeting, which will provide opportunities for developing team work skills and completing individual and team assessment tasks.

One extra small group tutorial (2 hour in total) allows students to attend their tutors laboratory meeting to experience the research environment, meet cancer researchers on different career paths and learn about the role of OH&S in the laboratory setting. This provides an opportunity for students to network and source out potential Honours supervisors.

3. The principal aim of the co-curricular classes (>10 hours in total) is to help students to construct disciplinary knowledge in its interdisciplinary context. The co-curricular classes provide an opportunity for students to visit cancer research institutes, laboratories and hospital departments to experience, identify and apply modern research techniques relevant to human cancer. They also provide an opportunity for students to amplify and extend their understanding of material and concepts covered in lectures and prescribed readings.
4. Individual and group study. Students will undertake individual and group study to complete key assignment tasks throughout the course (see Assessment).

Learning is supported via an e-portfolio module and the Moodle system, which is accessible via student number and zPass at <https://moodle.telt.unsw.edu.au>. A student ePortfolio, individual feedback and group discussion, course announcements, timetables, lecture slides and other resources will be made available during the course.

Assessment

The course covers a significant amount of new material and will require diligence and application to succeed. The learning objectives for each activity provide a focus for study, and should be previewed and reviewed for all activities. Students will take part in (self and peer) assessment together with academic staff.

The breakdown of assessments in the course is shown in the Table 1 below (the detailed assessment information will be introduced in the student course manual at week one of your study):

Table 1. PATH3208 Assessment

Task (total mark)	Subtask (submark)	Cumulative Mark
Group work		
Literature review (15%)	Literature review content (10%)	10%
	Teamwork records (5%)	15%
Project design (15%)	Presentation plus Q&A (10%)	25%
	Teamwork records (5%)	30%
Online self-assessments of teamwork skills development (both beginning and end of the course)		Compulsory
Individual assignments		
ePortfolio (5%)		35%
Cancer research article analysis (5%)		40%
Tailored resume and cover letter (10%)		50%
Mid-course online exam (10%)		60%
Final online MCQ examination (40%)		100%
Career development surveys (both beginning and end of the course)		Compulsory

Course Design

Table 2. PATH3208 Course Design and Assessment Planner

Changes in the timetable and locations will be announced and confirmed on Moodle course site.

Week	Lectures	Tutorials	Co-curricular classes	Assessment tasks (% of final mark)
1	L1. Overview of PATH3208 (L&T strategy and assessment)	T1 Self-directed and reflective Learning	CCC1- (A, B, C, D)# a: CAMD b: Ramaciotti Centre c: BMIF d: BRIL	1 st Compulsory Survey Set up or access personal ePortfolio, write/edit at least once fortnightly and submit at the end of the course (5%)
	L2. Current progress in cancer biology			
	L3. Colorectal cancer			
2	L4. Pancreatic cancer	T2 Group tutorial 1 (at an assigned room)	CCC2 - in ½ class e1: ACP, Lowy	
	L5. Ovarian cancer			
	L6. Lung cancer			
3	L7. Glioblastoma	T3 Career development learning-1	CCC3 - (A, B, C, D) a: CAMD b: Ramaciotti Centre c: BMIF d: BRIL	
	L8. Breast cancer			
	L9. Altered cell metabolism in cancer			
4	L10. Coagulation and cancer	T4 Group tutorial 2 (at an assigned room)	CCC4 - in ½ class e2: ACP, Lowy	Critical appraisal of a research paper (5%)
	L11. Prostate cancer			
	L12. Sarcoma			
5	L13. Common lab techniques	T5 Career development learning-2	CCC5 - (A, B, C, D) a: CAMD b: Ramaciotti Centre c: BMIF d: BRIL	
	L14. Statistical thinking in DME			
	L15. Advanced molecular techniques			

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6	L16. . Animal models in cancer research	T6 Group tutorial 3 (at an assigned room)	CCC6 - in class f: WW G06/G07 computer lab	
	L17. Bioinformatics			
	L18. Principles of cancer surgery			
7	L19. Stem cells and cancer	T7 Career development learning-3	CCC7 - (A, B, C, D) a: CAMD b: Ramaciotti Centre c: BMIF d: BRIL	Group & individual task: Literature review (15%)
	L20. Clinical trials and study designs			
	L21. Inherited cancer risk			
8	L22. Personalised cancer therapy, predictive and prognostic markers	T8 Group tutorial 4 (at an assigned room)	CCC8 - in class g: Lecture theatre, POWCS	
	L23. Epidemiology, Environment & Cancer			
	L24. Radiotherapy and functional imaging			
9	L25. Nano-oncology and theranostics	T9 Group tutorial 5 *LGM: experience real research meeting	CCC9 - in ½ class h1: Radiation Oncology, POWH	Cover letter & Specific Resume (10%) Mid-course online exam (10%)
	L26. Principles of Chemotherapy			
	L27. Telomere-maintenance-mechanism targeted therapy			
10	Presentation 1		CCC10 - in ½ class h2: Radiation Oncology, POWH	Group task: project design oral presentations (15%) 2 nd compulsory survey Course feedback
	Presentation 2			
	Presentation 3			
11	Presentation 4			
	Presentation 5			
12		Final online exam		Course final online examination (40%)

CCC A-D=Student CCC groups. CCC a-h=CCC venues and relevant guidelines. CAMD=Centre for Advanced Macromolecular Design. BMIF=Biomedical Imaging Facility. BRIL=Biomedical Resources and Imaging Laboratory. LGM=local group meeting, in which the group of students join their tutor's research group meeting.

Table 3. PATH3208 Course Title of Lectures, Tutorials and Co-curricular Classes

Name	Title
<i>Cancer Sciences Learning and Basic Biological Knowledge</i>	
L01	Overview of Cancer Sciences (PATH3208)
L02	Current progress in cancer biology
<i>Specific cancers or research fields for identification of a valid research question</i>	
L03	Colorectal cancer
L04	Pancreatic cancer
L05	Ovarian cancer
L06	Lung cancer
L07	Glioblastoma
L08	Breast cancer
L09	Altered cell metabolism in cancer
L10	Coagulation and cancer
L11	Prostate cancer
L12	Sarcoma
<i>Biotechnologies, Statistics and Cancer Research</i>	
L13	Common laboratory techniques
L14	Statistical thinking in project design, data measurement and evaluation
L15	Advanced molecular techniques for cancer research
<i>Animal and Research</i>	
L16	Animal models in cancer research
<i>Bioinformatics and cancer research</i>	
L17	Bioinformatics
<i>Cancer Therapy 1- Surgery</i>	
L18	Principles of cancer surgery
<i>Cancer Stem Cells</i>	
L19	Stem cells and cancer
<i>Clinical trials and study designs</i>	
L20	Clinical trials and study designs
<i>Carcinogenesis and Cancer Research</i>	
L21	Inherited cancer predisposition
<i>Cancer Therapy 2 – Personalised cancer therapy</i>	
L22	Personalised cancer therapy, predictive and prognostic markers
<i>Epidemiology and carcinogenesis</i>	
L23	Epidemiology, risk factors and environmental carcinogenesis
<i>Cancer Therapy 3 – Other cancer therapy</i>	
L24	Radiotherapy and functional imaging
L25	Nanooncology and theranostics

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L26	Principles of chemotherapy
L27	Telomere-maintenance-mechanism targeted therapy

Basic Laboratories and Cancer Clinical Centres

CCC a	Nanoparticles for biomedical application
CCC b	Advanced molecular technology
CCC c	Live cell imaging and confocal microscopy
CCC d	Animal Imaging
CCC e	Common techniques in basic cancer research
CCC f	Applied medical statistics
CCC g	Surgery for cancer
CCC h	Radiation and imaging

ePortfolio enhancing professional and career development learning

Tut 1	ePorfolio
Tut 2	Introduction to cancer research and critical analysis
Tut 3	Cover letter and resume
Tut 4	Research topic selection and literature review
Tut 5	How to prepare for and perform in a job interview
Tut 6	Project design, measurement and evaluation
Tut 7	How to gather occupational information
Tut 8	Presentation skills and feedback on group project design
Tut 9	Attending tutor's workgroup meeting

CCC=Co-curriculum class

Resources for students

Textbooks

Students are expected to access the following text:

The Biology of Cancer, 2nd Edition. Robert A Weinberg, ©2013, Taylor & Francis Group LLC. ISBN 9780815342205.

Additional materials are listed at

MEDICALSCIENCES.MED.UNSW.EDU.AU/STUDENTS/UNDERGRADUATE/LEARNING-RESOURCES

Health & Safety guideline

Students participating PATH3208 co-curricular classes must be guided by the site instructors and follow the health & safety requirement for visitors or observers. For visiting biological laboratories, students are required to wear laboratory coat over appropriate warm clothing, wear enclosed shoes with full coverage of the dorsum of the foot, do not eat, drink, or place anything (e.g. pens, pencils) into your mouth and always wash hands with liquid soap and dry thoroughly with disposable paper towel before leaving.

Generic safety rules for UNSW can be found at: SAFETY.UNSW.EDU.AU and for the School of Medical Sciences at MEDICALSCIENCES.MED.UNSW.EDU.AU/STAFF/STAFF/HEALTH-SAFETY

First Aid

Room 101 staff can provide First Aid during office hours and a list of other safety personnel is located beside the building lifts. First Aid Kits are located on the left wall near the Gross Anatomy Laboratory entrance door and in the east wing on the ledge opposite cubicle E4. All incidents must be reported.

Emergency evacuation

In the case of a fire or other emergency the evacuation alarm will sound. When it sounds for the first time this indicates that everyone should get prepared in case it is necessary to evacuate. When it sounds for the second time, an announcement will be made over the speaker system - **follow these instructions**. Staff will be on hand to supervise any evacuation and the emergency exit is at the south end of the lab, do **not use the lifts**. The evacuation assembly area is the landscaped space immediately to the east of the Chancellery and adjacent to the Clancy Auditorium. **Do not assemble anywhere else** and do not leave this area until instructed.