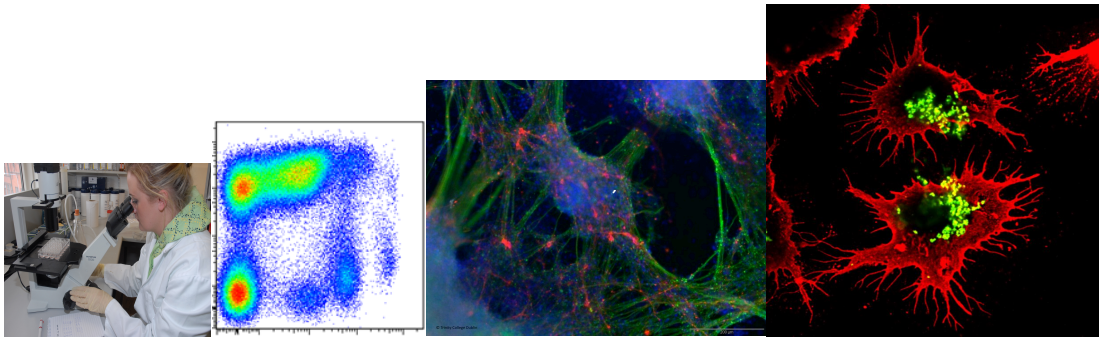


BIP77100
Core Biomedical Research Skills for PhD students (10 ECTS credits)

Module Co-coordinator: Dr Nóirín Nic a' Bháird

Module Description: This module will provide training in core research skills that are required to pursue a PhD by research in a biomedical field. Through a series of workshops it will provide students with hands-on training in tissue culture, a basic technique underpinning the majority of biomedical research, in addition to more advanced technologies such as flow cytometry, confocal microscopy and electron microscopy. In addition, through participation in the Biochemical Research Seminar Series students will have an opportunity to broaden their research knowledge and appreciation of the discipline and will have the opportunity to interact with world-renowned expert speakers from the fields of biochemistry and immunology, thus promoting their communication skills.

Module Learning Outcomes:

On successful completion of this module, students will be able to:

1. Outline all health and safety aspects pertaining to work with biological reagents and prepare a biological risk assessment for their research.
2. Describe cell culture basics, including the requirements of a cell culture lab, safety, aseptic technique, recognise microbial contamination of cell cultures, as well as demonstrate the basic methods for passaging, freezing, and thawing cultured cells, establishing primary cultures and selecting appropriate culture conditions for downstream applications.
3. Explain the fundamentals and applications of flow cytometry, and design their own experiments.
4. Explain the fundamentals in sample preparation and experimental design for light-based microscopy.
5. Describe the basic theory of Transmission Electron Microscopy and the variables involved in preparation of biological samples and demonstrate ability to successfully image samples and critically analyse results.
6. Critically appraise current scientific research being carried across the fields of biochemistry and immunology by way of developing critical thinking skills on the scientific process while promoting the ability to discuss scientific concepts thus enhancing communication skills.

Attendance/Participation:
Students' performance on the module is evaluated on the basis of good attendance and a pass on the assigned assessments. In order to accrue the 10 ECTS, participants will be

expected to attend lectures and practicals comprising all six workshops and complete the course assessments.

Assessment:

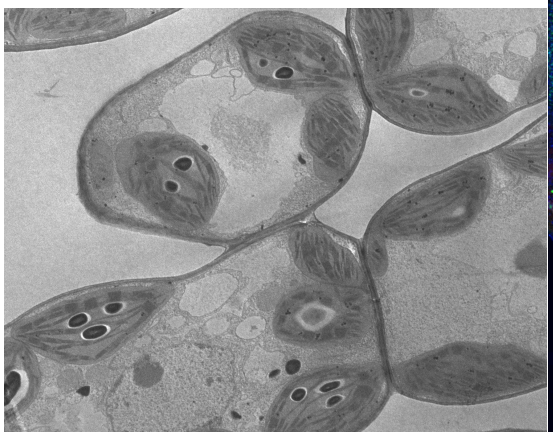
a. Participation in technical workshops 1-5: (**35%** contribution to final mark).
b. Assessment 1: Complete a Biological Risk assessment for specific PhD research project: (**5%** contribution to final mark)
c. Assessment 2: Preparation of resource-driven archive- repository of technical/application on one of the techniques covered in the workshop series (up to ~1000 words plus graphics): (**12.5%** contribution to final mark).
d. Assessment 3: Design of an experimental protocol utilising one of the technologies covered to address a specific research question relevant to the PhD project: (**10%** contribution to the final mark)
e. Attend 10 biochemical research seminars and participate in post seminar discussion forum with guest speaker: (**25%** contribution to the final mark)
f. Assessment 4: Submit a written report (~2000 words) on 1 seminar/discussion forum: (**12.5%** contribution to final mark).

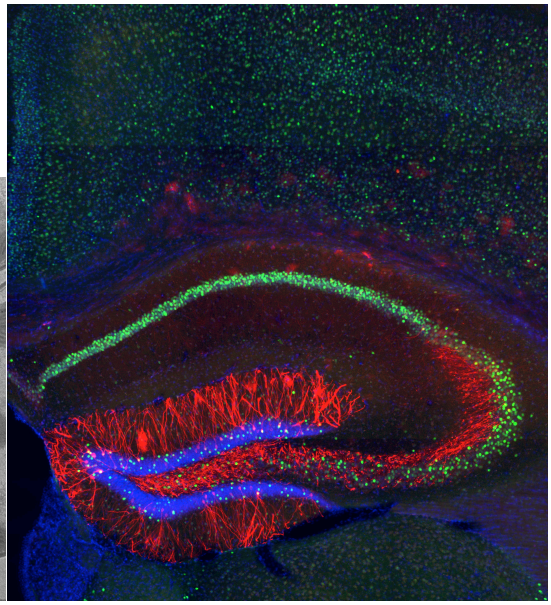
Documentation and Credit

To monitor progress, students will record their workshop attendance (contact hours) and assessments with the ECTS Monitoring Form which is kept on file. Once this is form is received, a certificate of module completion will be issued. It is envisioned that in the future this information will be recorded on SITS and credits will appear on the students transcript.

Registration:

To register for a place on this module please email NICABHAN@tcd.ie.
Closing date for registration 30/9/18





Timetable 2018/19

Introduction and welcome		RMMcL	1/10/18	10am-11am	FRED
Workshop 1: Safety Training	Lecture 1	NNB	1/10/18	11am-12pm	FRED
	Lecture 2	NNB	4/10/18	10am-12pm	6.07
	College Chemical Safety Workshop[$]	Various	TBD Usually May	All Day	TBC
	College Biological Safety Training[$]	Various	24/10/18	All Day	TBC
Assessment 1 Due 30/10/18					
Workshop 2: Cell Culture Technology	Lecture 1	NMW &BM	3/12/18	9am-1pm	FRED
	Practical Session 1	NMW &BM	3/12/18	2pm-5pm	L3.15
	Lecture 2	NMW &BM	4/12/18	9am-1pm	FRED
	Practical Session 2	NMW &BM	4/12/18	2pm-5pm	L3.15
Workshop 3: Basics of Flow Cytometry	Lecture 1	NMW &BM	5/12/18	9am-1pm	FRED
	Practical Session 1	NMW &BM	5/12/18	2pm-5pm	L3.22
	Lecture 2	NMW &BM	6/12/18	9-1	FRED
	Practical Session 2	NMW &BM	6/12/18	2-5	L3.22
	Lecture 3	NMW &BM	7/12/18	9-1	FRED
	Practical Session 3	NMW &BM	7/12/18	2-5	L3.22
Workshop 4: Microscopy 101	Lecture 1	GMcM	4/2/19	10-12	6.07
	Practical Session 1	GMcM	7/2/19	10-1pm	B2.51
Workshop 5: Principals of Biological Transmission Electron Microscopy	Lecture 1	NL	6/2/19	10-12pm	2.50
	Practical Session 1	NL	08/02/19	2-5pm	B3.06a
Assessments 2 & 3 Due 22/02/19					
Workshop 6: Biomedical Seminar series	Biochemical Research Seminars	Various	Various dates*	Usually 1-2pm	FRED
	Discussion Forum	Various	Various dates*	Usually 3.30-4.30pm	FRED
Assessment 4 Due 30/6/19					

RMcL: Rachel McLoughlin, NNB: Nóirín Nic a' Bháird, NMW: Natalia Munoz-Wolf, BM: Barry Moran, GMcM: Gavin McManus, NL: Neal Leddy

* The Biochemical Seminar series calendar will be available on the school website and is subject to change

Biochemical Seminar Series Semester 1 2018/19:

Semester 1

Date	Time of talk	Speaker	Location	Discussion w PGs	Location
25th Oct	5pm	Peter Andersen	TBC	1pm	FRED
13th Nov	1pm	Linda Sinclair	TBC	12noon	FRED
22nd Nov	1pm	Markus Engstler	TBC	3:30pm	FRED
29th Nov	1pm	Nicholas Ktistakis	TBC	3:30pm	FRED
5th Dec	1pm	David Brough	TBC	3:30pm	FRED
13th Dec	1pm	Patrick Harrison	TBC	3:30pm	FRED

Semester 2

Date	Time of talk	Speaker	Location	Discussion w PGs	Location
14th Mar	1pm	Thomas Kufer			
9th May	1pm	Francesco Colucci			