

BL3303 Membranes and Cell Communication

(BL3303 online module handbook version 31)

Credits: 20

Semester: 2

Module Organiser

Dr Marcus Bischoff

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Pre-requisite Modules:

Before taking this module you must pass BL2301 and (pass BL2305 or pass BL2306 or pass BL2309)

Anti-requisite Modules:

Post-requisite Modules:

Additional Module

Information:

Please [check MMS](#) regularly for additional module information

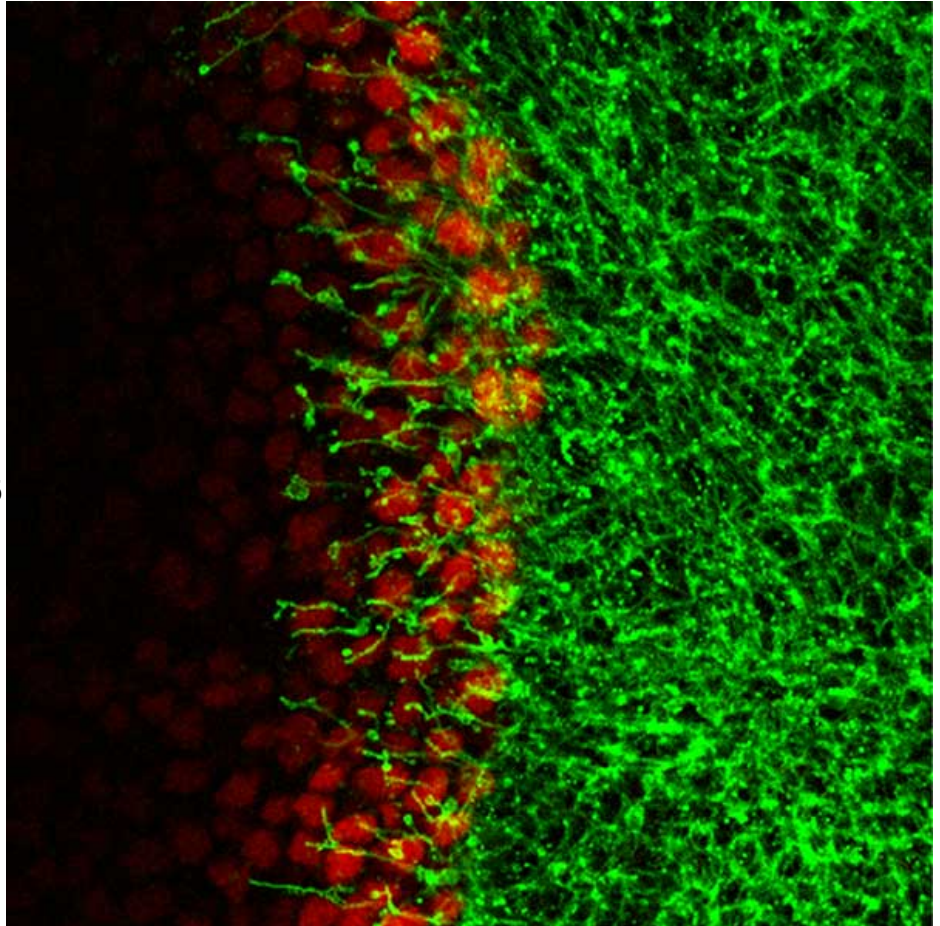


image: Cytonemes (green) and Hedgehog signalling activity reporter (red) in *Drosophila* wing imaginal disc.

This module looks at the various ways in which cells communicate with each other. Cell signalling not only involves the creation and reception of signals but also the mechanisms by which signals are transported across biological membranes. We will therefore consider the central role that biological membranes play in the regulation of the movement of molecules between different extracellular, intracellular and transcellular compartments. Also protein sorting and membrane trafficking will be studied. Using various examples of cell communication, the module will discuss both the molecular and the organismal implications of cell signalling. Topics covered include: (i) Lipids; (ii) Protein targeting and sorting; (iii) Membrane trafficking and transport; (iv) Wnt, Notch and Hedgehog signalling; (v) Plant cell signalling; (vi) Hippo signalling (vii) Ubiquitylation and SUMOylation.

[View the current Biology Online Module Catalogue for BL3303](#)

[BL3303View BL3303 \(2018/9\) in the University of St Andrews Module Catalogue](#)

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BL3303: Timetable

Legend (not all modules have every event type):

lecture	tutorial	workshop	practical	other
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Semester 2: Week 1

DATE & TIME	VENUE	STAFF	EVENT
Monday 28-01-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Terry Smith Dr Marcus Bischoff	Lecture L1: Lipids I <small>2018-9_BL3303_L1</small>
Tuesday 29-01-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Terry Smith	Lecture L2: Lipids II <small>2018-9_BL3303_L2</small>
Wednesday 30-01-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr David J Hughes	Lecture L3: Practical 1 - Introduction <small>2018-9_BL3303_L3</small>
Thursday 31-01-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr David J Hughes	Practical P1: Practical 1 - Cell fractionation <small>2018-9_BL3303_P1</small>
Friday 01-02-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr David J Hughes	Practical P2: Practical 1 - Cell fractionation <small>2018-9_BL3303_P2</small>

Semester 2: Week 2

DATE & TIME	VENUE	STAFF	EVENT
Tuesday 05-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr David J Hughes	Lecture L4: Practical 1 - Feedback/discussion <small>2018-9_BL3303_L4</small>
Wednesday 06-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Terry Smith	Tutorial T1: Tutorial 1 - Reading of a scientific article <small>2018-9_BL3303_T1</small>

Semester 2: Week 3

DATE & TIME	VENUE	STAFF	EVENT
Monday 11-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Terry Smith	Lecture L5: G protein-coupled receptors <small>2018-9_BL3303_L5</small>
Tuesday 12-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Terry Smith	Tutorial T2: Tutorial 2 - Summary of a scientific article <small>2018-9_BL3303_T2</small>

Semester 2: Week 4

DATE & TIME	VENUE	STAFF	EVENT
Monday 18-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L6: The secretory pathway & protein sorting <small>2018-9_BL3303_L6</small>
Tuesday 19-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L7: Molecular mechanisms of regulated exocytosis <small>2018-9_BL3303_L7</small>
Wednesday 20-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L8: Key experiments in membrane trafficking <small>2018-9_BL3303_L8</small>

Semester 2: Week 5

DATE & TIME	VENUE	STAFF	EVENT
Monday 25-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Marcus Bischoff	Lecture L9: Wnt signalling <small>2018-9_BL3303_L9</small>
Tuesday 26-02-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Marcus Bischoff	Lecture L10: Hedgehog signalling I <small>2018-9_BL3303_L10</small>

Wednesday 27-02-2019 09:00 to 10:00	Biomedical Sciences Building Lecture Theatre	Dr Marcus Bischoff	Lecture L11: Practical 2 - Introduction <small>2018-9_BL3303_L11</small>
Thursday 28-02-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr Marcus Bischoff	Practical P3: Practical 2 - Imaginal disc staining <small>2018-9_BL3303_P3</small>
Friday 01-03-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr Marcus Bischoff	Practical P4: Practical 2 - Imaginal disc staining <small>2018-9_BL3303_P4</small>

Semester 2: Week 6

DATE & TIME	VENUE	STAFF	EVENT
Monday 04-03-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Marcus Bischoff	Lecture L12: Hedgehog signalling II <small>2018-9_BL3303_L12</small>
Tuesday 05-03-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Marcus Bischoff	Lecture L13: Notch and Integrin signalling <small>2018-9_BL3303_L13</small>
Wednesday 06-03-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L14: Ion channels and their gating <small>2018-9_BL3303_L14</small>

Semester 2: Week 7

DATE & TIME	VENUE	STAFF	EVENT
Monday 11-03-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L15: Signalling pathways in GLUT4 trafficking <small>2018-9_BL3303_L15</small>
Tuesday 12-03-2019 09:00 to 10:00	Biomedical Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L16: Ras-proteins <small>2018-9_BL3303_L16</small>
Wednesday 13-03-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Gerald Prescott	Lecture L17: Desensitization of receptors, ubiquitination <small>2018-9_BL3303_L17</small>

Reading Week: 16-Mar-2019 to 31-Mar-2019

Semester 2: Week 8

DATE & TIME	VENUE	STAFF	EVENT
Monday 01-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Frank Gunn-Moore	Lecture L18: The discovery of Willin <small>2018-9_BL3303_L18</small>
Tuesday 02-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Frank Gunn-Moore	Lecture L19: Hippo signalling <small>2018-9_BL3303_L19</small>
Wednesday 03-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Prof Frank Gunn-Moore	Tutorial T3: Tutorial 3 - Reading of papers on Hippo signalling <small>2018-9_BL3303_T3</small>

Semester 2: Week 9

DATE & TIME	VENUE	STAFF	EVENT
Monday 08-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Paul Reynolds	Lecture L20: The Hippo signalling pathway and cancer <small>2018-9_BL3303_L20</small>
Tuesday 09-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Samantha Pitt	Lecture L21: An introduction into cellular Calcium signalling <small>2018-9_BL3303_L21</small>
Wednesday 10-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Alison Roberts	Lecture L22: Practical 3 - Introduction <small>2018-9_BL3303_L22</small>
Thursday 11-04-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr Alison Roberts	Practical P5: Practical 3 - Western blotting <small>2018-9_BL3303_P5</small>

Friday 12-04-2019 09:00 to 17:00	Purdie Building Honours lab, level 3	Dr Alison Roberts	Practical P6: Practical 3 - Western blotting <small>2018-9_BL3303_P6</small>
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Semester 2: Week 10

DATE & TIME	VENUE	STAFF	EVENT
Monday 15-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Alison Roberts	Lecture L23: Plant transport systems <small>2018-9_BL3303_L23</small>
Tuesday 16-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Alison Roberts	Lecture L24: Molecular trafficking in plants <small>2018-9_BL3303_L24</small>
Wednesday 17-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Jens Tilsner	Lecture L25: RNA signalling in plants <small>2018-9_BL3303_L25</small>

Semester 2: Week 11

DATE & TIME	VENUE	STAFF	EVENT
Monday 22-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr David J Hughes	Lecture L26: The SUMO signal <small>2018-9_BL3303_L26</small>
Wednesday 24-04-2019 09:00 to 10:00	Biomolecular Sciences Building Lecture Theatre	Dr Marcus Bischoff	Tutorial T4: Tutorial 4 - Deductive questions <small>2018-9_BL3303_T4</small>

BL3303: Reading List

[BL3303 Click for BL3303 reading list](#)

BL3303: Assessment

3-hour Written Examination = 66%, Coursework = 34%

Assessment:	Summary
Due by:	22/02/2019 14:00
Feedback due by:	15/03/2019 14:00
Type:	Turnitin
Weight:	41.2%

Assessment:	Report Practical 2
Due by:	15/03/2019 14:00
Feedback due by:	05/04/2019 14:00
Type:	Turnitin
Weight:	58.8%

(MMS assessment data cached: 21 February 2019
23:20:17.)

The following related information applies to all
Biology modules:

School of Biology Marking Criteria:	See School of Biology Undergraduate Handbook
Late submission of continuous assessment work:	All late submissions of coursework that do not require electronic submission should be made via the late submissions box in the Biomolecular Science Building (beside the Teaching Office)
Exam details:	See School of Biology Undergraduate Handbook
Exam timetable:	see http://www.st-andrews.ac.uk/students/academic/examinations/examtimetables/current/
Expected attendance:	See School of Biology Undergraduate Handbook for detailed attendance requirements.
Good Academic Practice & Avoiding Academic Misconduct:	See School of Biology Undergraduate Handbook
University Student Handbook:	University Student Handbook
School and University regulations in the School and University Undergraduate Handbook relating to absence reporting, penalties and rules for late submission of work, extensions for coursework, return of coursework, S-coding, good academic practice and Academic Alerts.:	School of Biology Undergraduate Handbook University Student Handbook

Who to ask

(Information in this section applies to all Biology Modules)

Questions about different aspects of the module should be directed to different people:

Questions about

General teaching matters
Rescheduled or cancelled events
Lecture or practical content
Completing assessed practical assignments
Completing assessments

Marking on continuous assessment

Marking on exams

Rearranging practical days

Absence and/or extensions

Difficulties with academic progress which impact more than one module:

Overall performance, progress or future directions:

Disability:

For advice and support on any issue e.g. academic, financial, international, personal or health matters, or if you are unsure of who to go to for help:

University assistance with urgent matters out of office hours:

Contact

Biology Teaching Office (bioteach@st-andrews.ac.uk)

Check your University email

The lecturer who presented the material

The lecturer who set the assignment

Module Organiser (Dr Marcus Bischoff mb273@st-andrews.ac.uk)

The Demonstrator or Module Organiser (Dr Marcus Bischoff mb273@st-andrews.ac.uk)

Module Organiser (Dr Marcus Bischoff mb273@st-andrews.ac.uk)

[Grant Brown](#)

Module Organiser (Dr Marcus Bischoff mb273@st-andrews.ac.uk) **and** the Biology Teaching Office (bioteach@st-andrews.ac.uk)

Year Coordinator

See [School of Biology Undergraduate student handbook](#) for list:

<http://biology.st-andrews.ac.uk/documents/UndergraduateHandbook.pdf>

Advisor of Studies

Disability Coordinator (Dr Jacqueline Nairn jn37@st-andrews.ac.uk)

Advice & Support Centre

Address: 79 North Street, St Andrews

Email: theasc@st-andrews.ac.uk

Web: <https://www.standrews.ac.uk/ask-a-question/>

Tel: 01334 462020

Tel: 01334 476161

Web: <https://www.st-andrews.ac.uk/students/advice/counselling/incrisis/>

Biology Teaching Office:

We are happy to hear from you about teaching matters. The School of Biology Teaching Office is open Monday to Friday 09.00 - 13.00 and 14.00 - 17.00. School of Biology staff will respond to your emails during these hours. Our team will provide a response to you within three working days.

Biology Teaching Office, The Biology Hive, New Technology Centre, University of St Andrews, North Haugh, St Andrews, Fife KY16 9SR

Email: bioteach@st-andrews.ac.uk

Tel: 01334 463602/3566

BL3303: Contributing Staff



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[Dr Alison Roberts](#)

Honorary Reader

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Professor

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[Dr Jens Tilsner](#)

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BL3303: Learning Outcomes

The objective of this module is to provide insights into how cells communicate with each other, emphasising properties of biological membranes, membrane trafficking and cell signalling. Also to facilitate the development of essential scientific skills.

Students completing module BL3303 successfully should be able to:

- Acquire an understanding of the biology of biological membranes, protein sorting and membrane trafficking
- Gain insights into the mechanisms underlying cell signalling and signal transduction
- Find and critically read and evaluate literature
- Produce a summary of a scientific paper and a practical report
- Produce a figure of the results of a practical
- Work in small teams in a lab-based context
- Plan work in order to meet deadlines
- Understand the principles that underlie cell communication

BL3303: Acquired Skills

Practical Skills

- Compound Microscopy
- Fixing and preserving specimens
- Image processing
- Pipetting
- Stereomicroscopy

Transferable Skills

- "Full" practical write-up (Intro, Methods, Results, Discussion)
- Completing a research paper from which sections have been removed
- Problem-solving questions
- Data presentation

Policies

(Information in this section applies to all Biology Modules)

- The procedures and regulations followed by the School of Biology are outlined in the [University Handbook](#) and in the [School of Biology Undergraduate Handbook](#) (<https://synergy.st-andrews.ac.uk/biocurrentstudent/files/2017/09/UndergraduateHandbook.pdf>).
- All coursework associated with the module must be completed and submitted by its due date.
- Specific School regulations relating to absence reporting, penalties and rules for late submission of work, extensions for coursework, return of coursework, S-coding, Good Academic Practice and Academic Alert are stated in the [School of Biology Undergraduate Handbook](#) and students are required to carefully read these regulations.
- Students are also referred to the University Handbook, available at: <http://www.st-andrews.ac.uk/studenthandbook/>