

BL2306 Biochemistry

(BL2306 online module handbook version 133)

Credits: 15

Semester: 2

Module Organiser

Dr Jacqueline Nairn

jn37@st-andrews.ac.uk

01334 463604

Pre-requisite Modules:

Before taking this module
you must pass BL1101 and
pass BL1102

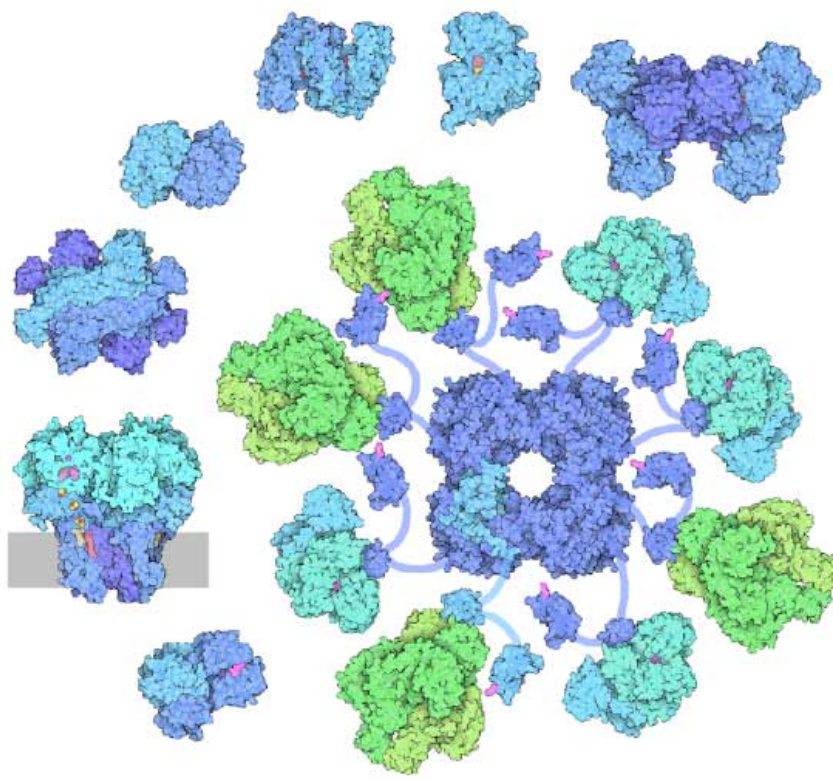
Anti-requisite Modules:

Post-requisite Modules:

Additional Module

Information:

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



Due to recent technological developments, metabolism and its regulation has re-emerged as an important area of Biology. This module will examine major biological macromolecules, the common motifs which occur in metabolic reactions, explore the properties of enzymes catalysing these reactions and consider the approaches to characterise the small molecule complement (metabolites) of biological systems. A number of central metabolic pathways and their control will be studied in detail, alongside examples of their importance in disease and recent metabolomic studies.

[BL2306View content for BL2306 \(2023/4\) in the Module Management System \(MMS\)](#)

[View the current Biology Online Module Catalogue for BL2306](#)

[BL2306View BL2306 \(2023/4\) in the University of St Andrews Module Catalogue](#)

Contents:

- Cover
- Contents
- Timetable
- Reading List
- Assessment
- Who To Ask
- Contributing Staff
- Learning Outcomes
- Acquired Skills
- Policies

BL2306: 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 15-01-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P1: Practical 1 - Module Introduction and Lab Skills 2023-4_BL2306_P1 Lab Group A
Tuesday 16-01-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P2: Practical 1 - Module Introduction and Lab Skills 2023-4_BL2306_P2 Lab Group B
Thursday 18-01-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L1: The building blocks of life I 2023-4_BL2306_L1
Friday 19-01-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L2: The building blocks of life II 2023-4_BL2306_L2

Semester 2: Week 2

DATE & TIME	VENUE	STAFF	EVENT
Wednesday 24-01-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L3: The building blocks of life III 2023-4_BL2306_L3
Thursday 25-01-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L4: The building blocks of life IV 2023-4_BL2306_L4
Friday 26-01-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L5: Introduction to Practical 2 Visualising Molecules 2023-4_BL2306_L5

Semester 2: Week 3

DATE & TIME	VENUE	STAFF	EVENT
Monday 29-01-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Tracey Gloster Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P3: Practical 2 - Visualising Molecules 2023-4_BL2306_P3 Lab Group A. Please bring laptops
Tuesday 30-01-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Tracey Gloster Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P4: Practical 2 - Visualising Molecules 2023-4_BL2306_P4 Lab Group B. Please bring laptops
Thursday 01-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L6: The building blocks of life V 2023-4_BL2306_L6
Friday 02-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster -	Lecture L7: Revision - the building blocks of life 2023-4_BL2306_L7

Semester 2: Week 4

DATE & TIME	VENUE	STAFF	EVENT
Wednesday 07-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L8: Enzyme kinetics I 2023-4_BL2306_L8
Thursday 08-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L9: Enzyme kinetics II 2023-4_BL2306_L9
Friday 09-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L10: Introduction to Practical 3 - Enzyme kinetics 2023-4_BL2306_L10

Semester 2: Week 5

DATE & TIME	VENUE	STAFF	EVENT
Monday 12-02-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P5: Practical 3 -Enzyme kinetics 2023-4_BL2306_P5 Lab Group A. Please bring laptops
Tuesday 13-02-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Mr Duncan Laird Mr Christopher Simmons-Riach Mr Alasdair Stenhouse	Practical P6: Practical 3 -Enzyme kinetics 2023-4_BL2306_P6 Lab Group B. Please bring laptops
Thursday 15-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L11: Enzyme kinetics III 2023-4_BL2306_L11
Friday 16-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L12: Enzymes: Mechanism of Action 2023-4_BL2306_L12

Semester 2: Week 6

DATE & TIME	VENUE	STAFF	EVENT
Wednesday 21-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L13: Revision - Enzyme Kinetics 2023-4_BL2306_L13
Thursday 22-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L14: Metabolic Control Strategies I 2023-4_BL2306_L14
Friday 23-02-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Tracey Gloster Dr Carolin Kosiol	Lecture L15: Introduction to Practical 4 Lysozyme Study 2023-4_BL2306_L15

Spring Break: 26-Feb-2024 to 01-Mar-2024

Semester 2: Week 7

DATE & TIME	VENUE	STAFF	EVENT
Monday 04-03-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Tracey Gloster Dr Carolin Kosiol	Practical P7: Practical 4 - Lysozyme Study 2023-4_BL2306_P7 Lab Group A. Please bring laptops
Tuesday 05-03-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Tracey Gloster Dr Carolin Kosiol	Practical P8: Practical 4 - Lysozyme Study 2023-4_BL2306_P8 Lab Group B. Please bring laptops
Thursday 07-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L16: Metabolic Control Strategies II 2023-4_BL2306_L16
Friday 08-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L17: Metabolic Control Activity 2023-4_BL2306_L17

Semester 2: Week 8

DATE & TIME	VENUE	STAFF	EVENT
Wednesday 13-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L18: Glycolysis and Gluconeogenesis 2023-4_BL2306_L18
Thursday 14-03-2024 09:00 to 10:00	Online online	Dr Jacqueline Nairn -	Lecture L19: Link between Glycolysis and TCA 2023-4_BL2306_L19 Recording & slides on Moodle
Friday 15-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L20: Introduction to Practical 5 - Protein purification 2023-4_BL2306_L20

Semester 2: Week 9

DATE & TIME	VENUE	STAFF	EVENT
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Monday 18-03-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Dr Shirley Graham	Practical P9: Practical 5 - Protein purification 2023-4_BL2306_P9 Lab Group A. Please bring laptops.
Tuesday 19-03-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Dr Shirley Graham	Practical P10: Practical 5 - Protein purification 2023-4_BL2306_P10 Lab Group B. Please bring laptops.
Thursday 21-03-2024 09:00 to 10:00	Other	-	Lecture L21: NO LECTURE 2023-4_BL2306_L21
Friday 22-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L22: TCA and ETC 2023-4_BL2306_L22

Semester 2: Week 10

DATE & TIME	VENUE	STAFF	EVENT
Wednesday 27-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Jacqueline Nairn -	Lecture L23: Fatty Acid Metabolism and Metabolism Revision 2023-4_BL2306_L23
Thursday 28-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L24: Purine/Pyrimidine Metabolism I 2023-4_BL2306_L24
Friday 29-03-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L25: Purine/Pyrimidine Metabolism II 2023-4_BL2306_L25

Semester 2: Week 11

DATE & TIME	VENUE	STAFF	EVENT
Monday 01-04-2024 14:00 to 17:00	Biomedical Sciences Building Teaching Lab A	Dr Jacqueline Nairn Dr Shirley Graham	Practical P11: Practical 6 - SDS PAGE 2023-4_BL2306_P11 Lab Group A. Please bring your laptop
Tuesday 02-04-2024 14:00 to 17:00	Biomolecular Sciences Building Teaching Lab A	Dr Jacqueline Nairn Dr Shirley Graham	Practical P12: Practical 6 - SDS PAGE 2023-4_BL2306_P12 :ab Group B. Please bring your laptop
Thursday 04-04-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva -	Lecture L26: Amino acid metabolism 2023-4_BL2306_L26
Friday 05-04-2024 09:00 to 10:00	Willie Russell Laboratories Lecture Room B	Dr Rafael Guimaraes da Silva Dr Jacqueline Nairn	Lecture L27: Revision of RGdS material & BL2306 exam preparation 2023-4_BL2306_L27

BL2306: Reading List

[BL2306Click for BL2306 reading list](#)

BL2306: Assessment

2-hour Written Examination = 50%, Coursework = 50%

[BL2306View coursework assessment details for BL2306 \(2023/4\) in MMS](#)

The following related information applies to all Biology modules:

School of Biology Marking Criteria:	See JH booklet info (st-andrews.ac.uk)
Late submission of continuous assessment work:	All late submissions of coursework that do not require electronic submission should be made via the Biology Teaching Office, Level 2, BMS Building, North Haugh.
Exam details:	See School of Biology UG Handbook JH booklet info (st-andrews.ac.uk) : All Biology exams will be conducted online for 2022-23.
Exam timetable:	See Timetables - Exams - University of St Andrews (st-andrews.ac.uk)
Expected attendance:	See JH booklet info (st-andrews.ac.uk) for detailed attendance requirements.
Good Academic Practice & Avoiding Academic Misconduct:	See JH booklet info (st-andrews.ac.uk)
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.:	JH booklet info (st-andrews.ac.uk) University Student Handbook

Who to ask

(Information in this section applies to all Biology Modules)

Before contacting staff, students should check the content of the Biology Undergraduate Handbook, the module handbook and specific task instructions.

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 Jacqueline Nairn jn37@st-andrews.ac.uk](mailto:Dr.Jacqueline.Nairn.jn37@st-andrews.ac.uk))
The Demonstrator or Module Organiser ([Dr Jacqueline Nairn jn37@st-andrews.ac.uk](mailto:Dr.Jacqueline.Nairn.jn37@st-andrews.ac.uk))
Module Organiser ([Dr Jacqueline Nairn jn37@st-andrews.ac.uk](mailto:Dr.Jacqueline.Nairn.jn37@st-andrews.ac.uk))
Module Organiser ([Dr Jacqueline Nairn jn37@st-andrews.ac.uk](mailto:Dr.Jacqueline.Nairn.jn37@st-andrews.ac.uk))
Module Organiser ([Dr Jacqueline Nairn jn37@st-andrews.ac.uk](mailto:Dr.Jacqueline.Nairn.jn37@st-andrews.ac.uk)) **and** the Biology Teaching Office (bioteach@st-andrews.ac.uk)
Year Coordinator
See School of Biology UG Handbook for list: [JH booklet info \(st-andrews.ac.uk\)](http://www.st-andrews.ac.uk/jh-booklet-info)
Advisor of Studies
Disability Coordinator (biodisabilities@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 (Level 2), University of St Andrews, Biomolecular Sciences Building, North Haugh, St Andrews, Fife KY16 9ST

Email: bioteach@st-andrews.ac.uk

Tel: 01334 46 3602 or 3566

BL2306: Contributing Staff

<u>Dr Jacqueline Nairn</u> (Module Organiser)	Senior Lecturer	<u>jn37@st-andrews.ac.uk</u>
<u>Dr Tracey Gloster</u>	Reader	<u>tmg@st-andrews.ac.uk</u>
<u>Dr Shirley Graham</u>	Research Fellow	<u>sg71@st-andrews.ac.uk</u>
<u>Dr Rafael Guimaraes da Silva</u>	Research Fellow	<u>rgds@st-andrews.ac.uk</u>
<u>Dr Carolin Kosiol</u>	Reader	<u>ck202@st-andrews.ac.uk</u>
<u>Mr Duncan Laird</u>	Teaching Laboratory Technician	<u>dsl6@st-andrews.ac.uk</u>
<u>Dr Jacqueline Nairn</u> (Module Organiser)	Senior Lecturer	<u>jn37@st-andrews.ac.uk</u>
<u>Mr Christopher Simmons-Riach</u>	Technician	<u>csr5@st-andrews.ac.uk</u>
<u>Mr Alasdair Stenhouse</u>	Laboratory Teaching Technician	<u>ajs3@st-andrews.ac.uk</u>

BL2306: Learning Outcomes

Students completing module BL2306 successfully should be able to:

- Explain the chemistry and structure of the major biological macromolecules and how that determines their biological properties
- Mine, manipulate and interpret data from small molecule and macromolecular databases
- Use molecular viewers
- Explain the chemical and thermodynamic principles underlying biological catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms
- Conduct experiments to explore enzyme activity
- Demonstrate a critical understanding of essential features of cell metabolism and its control, including topics such as energy and signal transduction, respiration and photosynthesis
- Appreciate the diversity of small molecules within cells, their dynamic concentration range and how to study these, both individually and as part of a metabolome

BL2306: Acquired Skills

Practical Skills

- Biomolecule isolation/characterisation
- Buffers
- Chromatography
- Database interrogation
- Enzyme assay
- Kinetic data analysis
- Molecular viewer software
- Pipetting
- Protein characterisation
- Protein purification
- Protein quantitation

Transferable Skills

- Preparing group poster on given topic
- Q+A poster session
- "Full" practical write-up (Intro, Methods, Results, Discussion)
- "Short" practical write-up (e.g. completed worksheet)
- Handout (for presentation or poster)
- Critically evaluating sources/information
- Finding information on the web
- Finding literature
- Referencing
- Searching databases
- Sourcing figures/tables
- Lab safety awareness
- Problem-solving questions
- Calculations/equations
- Concentrations
- Data analysis
- Data presentation
- Dilutions
- Draw a line of best fit
- Produce graphs/figures
- Produce tables
- SI units
- Use Excel
- Use R or R Studio
- Working in pairs/small groups

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 UG handbook [JH booklet info \(st-andrews.ac.uk\)](#)
- 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 UG handbook [JH booklet info \(st-andrews.ac.uk\)](#) 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/>