

Principles of Biology laboratory

BIOL-UA 9123 L01

NYU London: Spring 2022

Instruction Mode:

(Remote for first two weeks January 26th and February 2nd)

In-person from Wednesday February 9th

If you are enrolled in this course 100% remotely and are not a Study Away student at NYU London, please make sure that you've completed the online academic orientation via Brightspace so you are aware of site specific support structure, policies and procedures. Please contact nyul.academics@nyu.edu if you have trouble accessing the Brightspace site.

Instructor Information

- Dr Valerie Wells
- valerie.wells@nyu.ac.uk
- Office Hours – to be arranged

Course Details

- Wednesday 1pm-4pm
- All times are London GMT until March 25th; thereafter GMT+1
- **Location: Birkbeck College Main Building, Malet Street, Room 319**
- Zoom links will be provided in Brightspace if the need should arise
- Lab bench space assignment: You will be assigned a space on the first day and are expected to use that space for the entire semester due to NYU COVID-19 safety protocol.

Prerequisites

General Chemistry I and II

Course Description

The course gives the opportunity to carry out experimental scientific inquiry and to acquire knowledge, linked to the foundations of the Principles of Biology I and II lectures. It will provide a direct experience of the most current topics in research, while providing the groundwork for higher level courses at NYU and preparation for future careers. Hypothetical scientific questions will be addressed, research techniques will be carried out, observational skills will be tested and students will develop their scientific writing skills.

Course Objectives

Upon Completion of this Course, students will be able to:

- Understand current research methods in Biology
- Carry out selected research techniques
- Understand and carry out Scientific Writing

Assessment Components

If you are an NYU London study-away student, you are expected to attend in person. If you are accessing the class remotely, you must attend synchronously.

Assignments / Activities	Description of Assignment	% of Final Grade	Due
Class participation	punctuality, preparation, conduct, engagement – discussion, questioning, interest, collegiality	10%	
In class Multiple Choice Quizzes	8 quizzes, approximately 2.5% each	20%	In lab class – refer to schedule in lab manual
In class Problem Solving	10 assignments, approximately 2.5% each	25%	In lab class - refer to schedule in lab manual
Scientific writing	Introduction, Methods; Results, Discussion based on	20%	April 27th

Assignments / Activities	Description of Assignment	% of Final Grade	Due
	one complete experiment: Lab 5 Tree of Life: Animal Phylogeny (1500-2000 words)		
Final lab practical exam	Based on practical, observational and analytical skills addressed during the semester, and on knowledge and identification of specimens (Two hours)	25%	In lab class 11th May 1pm-3pm

Assessment Expectations

Letter Grade	Grade Percentage	Description
A-range	A = 93-100% A- = 90-92%	Excellent commitment to practical work. Excellent work showing a thorough knowledge and understanding of the topics, with excellent use of scientific language, detailed analysis and clear logical explanations, showing insight, independent, original thought and reasoning. The scientific writing should reveal a considerable degree of independent reading and research and should include the use of peer reviewed primary reference material.
B-range	B+ = 87-89% B = 84-86% B- = 80-83%	Good commitment to practical work. Good work with good general knowledge and understanding of the topics, accurate use of scientific language, good general analysis and coherent explanations showing some independent thought and reasoning. The scientific writing should reveal some independent reading and research and may include the use of some peer reviewed primary reference material.
C-range	C+ = 77-79% C = 74-76% C- = 70-73%	Satisfactory commitment to practical work. Satisfactory work, broadly correct both factually and analytically, with some explanation and reasoning: the work will typically

Letter Grade	Grade Percentage	Description
		demonstrate a basic understanding of the topics.
D-range	D+ = 67-69% D = 65-66%	Passable commitment to practical work. Passable work, showing a general, superficial knowledge and understanding of the topics, lacking satisfactory use of scientific language or adequate analysis or reasoned explanations.
F	F = below 65%	Unsatisfactory work in assessed criteria

Course Materials

Required Text(s) & Materials

Campbell Biology 12th edition (Urry, Cain, Wasserman, Minorsky, Orr) – referred to as Biology by Urry below.

Your course is participating in the Follett Access program. To promote affordability, NYU has partnered with the NYU Bookstore to offer you this program to give you substantial savings on your course materials. The book for this course, Campbell's Biology by Urry will be delivered to you digitally. You should have receive an email before classes began, giving you the link to access the material. The **cost of the book is \$27.75**, which will be added as a "book charge" to your bursar bill, this is a savings of \$258.90 over the new hardcopy price.

Please note: If you received the book in the BIOL-UA 11, you can still access it on your bookshelf. You will not be charged again. **If you opted out for the book previously, you will need to opt out again.**

If you decide not to use this digital edition you can opt-out of the program. The deadline for opting out is **February 8th**. The link to opt out of the program is:

<https://includedcp.follett.com/2015>

The laboratory manual will be provided in the first in-person laboratory class

Resources

- **Access your course materials:** [Brightspace](#)
- **NYU London and Living in London Info:** [LDN](#)
- **Databases, journal articles, and more:** [Bobst Library](#)

- **Assistance with strengthening your writing:** [NYU Writing Center](http://nyu.mywconline.com) (nyu.mywconline.com)
- **Obtain 24/7 technology assistance:** [IT Help Desk](#)

Course Schedule

Reminder: Links to join class Zoom meetings will all be available in Brightspace if the need should arise

Topics & Assignments

Week/Date	Topic Reading in all sessions – relevant pages in the lab manual	Assignment Due
January 26th Remote	Zoom link is in Brightspace Laboratory Syllabus, Laboratory Safety, Covid Safety	
February 2nd Remote	Zoom link is in Brightspace Laboratory Background theory for Sessions 2 to 6	
IN LAB Session 1 Feb 9th	Pipetting	
Session 2 February 16th	Topic 2 Genotype to Phenotype PTC Analysis. DNA Isolation	
Session 3 February 23rd	Genotype to Phenotype continued PTC Analysis: DNA Electrophoresis and Analysis. Topic 3 Genetic Transformation	
Session 4 March 2nd	Genotype to Phenotype continued Genetic Transformation continued	
Session 5 March 9th	Topic 5 Tree of Life; Animal Phylogeny DNA extraction, PCR	
Session 6 March 23rd	Tree of Life; Animal Phylogeny continued DNA electrophoresis, preparation for sequencing	
Session 7	Tree of Life; Animal Phylogeny continued	

Week/Date	Topic Reading in all sessions – relevant pages in the lab manual	Assignment Due
March 30th	Live and prepared slide specimens	
Session 8 April 6th	Tree of Life; Animal Phylogeny continued Analysis of sequence data Prepared slides specimens	
Session 9 April 13th	Topic 7 Plant Diversity	April 20th Submit Scientific Writing Methods
Session 10 April 27 th	Revision of prepared specimens form Topic 5 and Topic 7	Submit Scientific Writing Complete document
Session 13 May 4 th	Topic 4 RNA interference	
Session 14 May 11 th Final assessment	Final Practical Exam based on practical, observational and analytical skills addressed during the semester, and on knowledge and identification of specimens (Two hours)	

Course Policies

Classroom Etiquette

Toilet breaks should be taken before or after class.

Food & drink, including gum, are not to be consumed in class.

Please kindly dispose of rubbish in the bins provided outside the laboratory.

Mobile phones should be off or set on silent and must be left in your bag

Laptops are only to be used in certain lab classes with the permission of the teacher (analysis of DNA sequences)

Final exams

Final exams must be taken at their designated times. Should there be a conflict between your final exams, please bring this to the attention of the London Academics team

(nyul.academics@nyu.edu). **Final exams may not be taken early, and students should not plan to leave the site before the end of the finals period.**

Academic Honesty, Plagiarism and Late Work

Students at Global Academic Centers must follow the [University and school policies](#). You can find details on these topics and more on this section of our NYUL website (<https://www.nyu.edu/london/academics/academic-policies.html>) and on the Policies and Procedures section of the NYU website for students studying away at global sites (<https://www.nyu.edu/academics/studying-abroad/upperclassmen-semester-academic-year-study-away/academic-resources/policies-and-procedures.html>).

Attendance

Key information on NYU London's absence policy, how to report absences, and what kinds of absences can be excused can be found on our [website](#) (<http://www.nyu.edu/london/academics/attendance-policy.html>)

To ensure the integrity of the academic experience, class attendance is required and expected promptly when class begins. These rules apply to class excursions and activities as well.

Members of any religious group may, without penalty, excuse themselves from classes when required in compliance with their religious obligations, but must follow NYU London's absence reporting procedure. Please note that an absence is only excused for the holiday but not for any days of travel that may come before and/or after the holiday. See also [University Calendar Policy on Religious Holidays](#)

Moses Accommodations Statement

Academic accommodations are available for students with documented and registered disabilities. Please contact the Moses Center for Student Accessibility (+1 212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

Inclusivity Policies and Priorities

NYU's Office of Global Programs and NYU's global sites are committed to equity, diversity, and inclusion. In order to nurture a more inclusive global university, NYU affirms the value of sharing differing perspectives and encourages open dialogue through a variety of pedagogical approaches. Our goal is to make all students feel included and welcome in all aspects of academic life, including our syllabi, classrooms, and educational activities/spaces.

Pronouns and Name Pronunciation (Albert and Zoom)

You can edit your pronoun and name pronunciation information on your Albert account, making it visible for faculty and staff. Information on how to do this can be found on the

[Pronouns and Name Pronunciation web page](#), and for more information on how to make these changes in Zoom, please see the [Personalizing Zoom Display Names website](#).

Bias Response

The New York University Bias Response Line provides a mechanism through which members of our community can share or report experiences and concerns of bias, discrimination, or harassing behavior that may occur within our community. For more information, including how to report an incident, visit the [Bias Response Line website](#).

Your Lecturer

Valerie Wells is a research scientist. Her research is focused on defining differences in the signalling pathways which operate in normal and cancer cells, in order to exploit differences in their genetic makeup which can be targeted to selectively activate programmed cell death in cancer cells while leaving normal cells unharmed. A novel cytokine, beta-GBP (beta-galactoside binding protein), has been identified and cloned and has been found to selectively induce apoptosis in cancer cells. Valerie Wells is currently investigating the molecular signalling pathways activated by β GBP leading to programmed cell death and to immunogenic cell death.

Recent publications

Mallucci L. and Wells V. (2021) Intrinsic S phase checkpoint enforced by an antiproliferative oncosuppressor cytokine. *Cancer Gene Therapy* Nov4 doi:10.1038/s41417-021-00397-3.

Cirone, M., Lotti, L., Granato, M., Di Renzo, L., Biunno, I., Cattaneo M., Verginelli, F., Vespa, S., Davies, D., Wells, V., Mariani-Costantini, R., Mallucci, L. (2019) Sourcing the immune system to induce immunogenic cell death in Kras-colorectal cancer cells. *British Journal of Cancer* 121, 768–775.

Mallucci, L. and Wells, V. (2014) The end of Kras cancers? A new way forward. *Drug Discovery Today*, 19, 383-387.

Mallucci, L., Shi, D., Davies D., Jordan, P., Nicol, A., Lotti, I., Mariani-Costantini, R., Verginelli, F., Wells, V. and Zicha, D. (2012) Killing of Kras mutant colon cancer cells via Rac-independent actin remodeling by the beta-GBP cytokine a physiological PI3K inhibitor therapeutically effective in vivo. *Mol. Canc. Ther.* 11, 1884-1193.

Baatar, D., Olkhanud, P. B., Wells, V., Indig, F. E., Mallucci, L. and Biragyn, A. (2009) Tregs utilize beta-galactoside binding protein to transiently inhibit PI3K/p21^{ras} activity of human CD8⁺ T cells to block their TCR-mediated ERK activity and proliferation. *Brain, Behavior and Immunity* 23, 1028-1037.

Wells, V. and Mallucci, L. (2009). Phosphoinositide 3-kinase targeting by the beta-galactoside binding protein cytokine negates akt gene expression and leads aggressive breast cancer cells to apoptotic death. *Breast Cancer Research* 11, R2 1-10

Wells, V., Downward, D. and Mallucci, L. (2007). Functional inhibition of PI3K by the beta-GBP molecule suppresses Ras-MAPK signalling to block cell proliferation. *Oncogene* 26, 7709-7714.

Mallucci, L. and Wells, V. (2007). Alternative use of signaling by the beta-GBP cytokine in cell growth modulation and cancer control. From surveillance to therapy. In: *Apoptosis, Cell Signaling and Human Diseases*. Ed. R. Srivastava. The Humana Press Inc. Vol. I, 203-216.

Mallucci, L. and Wells, V. (2005). β GBP: Potential role in cancer therapy. *Curr. Opin.in Investig. Drugs* 6, 1228-1233

Ravatn, R., Wells, V., Nelson, L., Vettori, D., Mallucci, L., and Chin, K.V. (2005). Circumventing multi-drug resistance in cancer by beta-GBP, an antiproliferative cytokine.

Cancer Res. 65, 1631-1634.

Recent participation in International conferences

- 2019 2nd Crick International Cancer Conference. London UK. Genomic Integrity and Cancer.
- 2013 AACR Annual Conference, Washington DC, USA, April 2013. BetaGBP: a physiological PI3K inhibitor and a potent and selective anticancer agent.
- 2012 AACR Annual Conference, Chicago, USA, April 2012. Killing of Kras mutant colon cancer cells by the beta-GBP cytokine, a physiological PI3K inhibitor therapeutically effective *in vivo*.
- 2010 AACR Annual Conference, Washington, USA, April 2010. PI3K inhibition by the beta-GBP cytokine in colon cancer cells. Combined activation of intrinsic and extrinsic apoptosis.
- 2008 2nd International conference on PI3K Targeting in Cancer, Boston MA, November 12-15 2008. Targeting cancer through PI3K by the beta-GBP cytokine and induction of apoptosis by the activation of alternative pathways.