

Principles of Biology II

BIOL-UA 9012 L01

NYU London: Spring 2022

Instruction Mode:

Remote for the first two weeks only (January 26th to February 4th)

In-person from Monday February 7th

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
- To be arranged (convenient times for students to be discussed in the first class)

Course Details

- Lecture class: Monday 9am-10.15am; Wednesday 9am-10.15am; Recitation: Monday 11.50am-12.45pm
- All times are London time GMT until March 27th, thereafter GMT+1
- Location: **Classrooms are provided in Albert**
- Remote: **Zoom links are provided in Brightspace**
- Seat Assignments: Attending in person: you will be assigned a seat on the first day and are expected to use that seat for the entire semester due to NYU COVID-19 safety protocol.

Prerequisites

General Chemistry I and II

Course Description

Introductory course for Science majors designed to acquaint the student with the fundamental principles and processes of biological systems. Subjects include the basics of chemistry pertinent to biology, biochemistry and cell biology and animal physiology-the function of systems in multicellular organisms

Lectures, recitations, discussions, written forum discussions, course essay.

Course Objectives

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

- Have an understanding of the Principles of Biology
- Critically analyse and present information and data in written and verbal form

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	Class Participation	10%	
Course essay	2000 word essay on an aspect of genetics (details will be given when the essay is assigned on 21st February)	25%	28th March
Quizzes	3 quizzes, each quiz - 15 MCQ questions; 20 minutes Each quiz will be on the previous three/four weeks' work. Each quiz is worth 5%;	15%	In <u>recitation</u> class: Feb 14th; March 21st; April 25th
Mid term exams	Two exams, each 45 minutes. 10% each exam	20%	In lecture class: 23rd

Assignments / Activities	Description of Assignment	% of Final Grade	Due
	Genetics Problem Solving; Ecology Problem Solving; Short written answers		February and 8th April
Final exam	Two hours. Covers work of entire semester Problem solving and short written answers	30%	11th May-16th May

Assessment Expectations

Letter Grade	Grade Percentage	Description
A-range	A = 93-100% A- = 90-92%	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. Work should reveal a considerable degree of independent reading and research and coursework should include the use of primary peer reviewed reference material.
B-range	B+ = 87-89% B = 84-86% B- = 80-83%	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 reasoning, reading and research. Coursework may include the use of some primary reference material
C-range	C+ = 77-79% C = 74-76% C- = 70-73%	Satisfactory work, broadly correct both factually and analytically, with some explanation and reasoning: the work will typically demonstrate a

Letter Grade	Grade Percentage	Description
		basic understanding of the topic.
D-range	D+ = 67-69% D = 65-66%	Passable work, showing a general, superficial knowledge and understanding of the topic, 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 received 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>

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](#)
(nyu.mywconline.com)
- **Obtain 24/7 technology assistance:** [IT Help Desk](#)

Course Schedule

Topics & Assignments

Week/Date	Topic and Reading	Assignment Due
Session1 January 26th	Genes on Chromosomes L1 Mendelian Genetics (14)	
Session 2 FRIDAY January 28th	L2 Genes on chromosomes Sex/sex linkage; Linkage/linkage mapping (15) and (13)	
Session 3 January 31 st	L3 Pedigree analysis; Quantitative traits: Epistasis; polygenic traits; quantitative trait loci (14,15)	
Session 4 February 2nd	Genes and Environment L4 Genotype and Environment; Heritability (Supplementary References)	
Session 5 February 7th	Genes in Populations L5 Genes in populations: Hardy- Weinberg equilibrium (23); hypothesis testing	
Session 6 February 9 th	L6 Genes in populations: Linkage disequilibrium GWAS (Supplementary References)	
Session 7 February 14 th	Darwin and Natural Selection L7 Darwin and Natural selection (22, 23)	Quiz 1 in recitation class
Session 8 February 16th	L8 Species Concept (24)	
Session 9 February 21st	Phylogeny L9 Phylogeny: Principles: Phylogenetic Trees; Molecular Evolution (26)	

Week/Date	Topic and Reading	Assignment Due
Session 10 February 23rd	Midterm exam 1 9am-9.45am – covers work from 26th January to 16th February L9 Phylogeny: Principles: Phylogenetic Trees; Molecular Evolution (26) (continued) Course essay on an aspect of genetics assigned	
Session 11 February 28 th	L 10 Genomes and Evolution	
Session 12 March 2nd	L11 History of Life on Earth; (25)	
Session 13 March 7th	Evolution and Diversity L12 Animal Evolution and Diversity: (32-34)	
Session 14 March 9th	L12 Animal Evolution and Diversity: (32-34)	
Session 15 March 21st	L13 Plant diversity (29, 30)	Quiz 2 in recitation class
Session 16 March 23rd	Ecology Global ecosystems L14 Introduction; Global Climate Patterns; Regional and Local Effects on Climate	
Session 17 March 28 th	L15 Terrestrial Biomes: (52)	
Session 18 March 30th	L16 Aquatic Biomes: (52)	
Session19 April 4th	Population Ecology L17 Populations (53)	
Session 20 April 6th	Population and Community Ecology L18 Population Dynamics (54, 56)	
Session 21	Midterm Exam 2 9am-9.45am - covers material	

Week/Date	Topic and Reading	Assignment Due
FRIDAY April 8th	from 21st February to 30th March Community Ecology L18 Population Dynamics (54, 56), (continued)	
Session 22 April 11th	Community Ecology L19 Competition, Mutualism, Commensalism (54, 27.5, 27.6, 30.3, 31.5, 37.3, 38.1, 41.4) Predators (54, 39.5)	
Session 23 April 13th	L20 Predators (54, 39.5)	
Session 24 April 20th	L21 Parasites (31.5, 54)	
Session 25 April 25th	Disease Ecology L22 Analysis	Quiz 3 in recitation class
Session 26 April 27th	Ecosystem Ecology L23 Carbon flow (55)	
Session 27 May 4th	L24 Nutrient Cycling (55, 27.5, 28.6)	
Session 28 May 9th	L25 Human Impacts on the Environment (56)	
Final Exam Between May 11th and May 16th inclusive	Final exam on date between Wednesday May 11 th and Monday May 16 th inclusive Covers work of entire semester Do not book any flights until the date of the PoB II exam has been confirmed. You must do the exam on the designated date at the designated time.	

Course Policies

Classroom Etiquette

To optimize the experience in a blended learning environment, please consider the following:

- Please be mindful of your microphone and video display during synchronous class meetings. Ambient noise and some visual images may disrupt class time for you and your peers.
- Please do not eat during class and minimize any other distracting noises (e.g. rustling of papers and leaving the classroom before the break, unless absolutely necessary).
- If you are not using your cell phone to follow the lesson, cell phones should be turned off or in silent mode during class time.
- Make sure to let your classmates finish speaking before you do.
- If deemed necessary by the study away site (ie COVID related need), synchronous class sessions may be recorded and archived for other students to view. This will be announced at the beginning of class time.
- Students should be respectful and courteous at all times to all participants in class.

Laptops may be used in class, but at times students will be asked to close their laptops and it is expected that this will be respected. Exceptions will be made for students with academic accommodations from the Moses Center. (I will have been informed by the Moses Center.)

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 controlled by beta-GBP to regulate the normal cell cycle and those activated by β GBP leading to programmed cell death and to immunogenic cell death in tumour cells.

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

Ravath, 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.