Diversity and Evolution of Eukaryotes 2024

Course Information

Item	Content
Course title	Diversity and Evolution of Eukaryotes
Semester	Fall semester each year
Instructor	CHUAN KU
Full/Half Yr.	Half
Required/Elective	Elective
Time	Friday 5,6 (12:10am-14:10pm)
Place	共 202
Remarks	The course is conducted in English。

Course Syllabus

Item	Content
Course Description	This is an introductory course on the diversity of eukaryotes in different aspects — from genomes to ecological interactions. Major topics include evolutionary relationships and history, cell structures and functions, and importance for various ecosystems and humanity. More emphasis is put on eukaryotes less covered in other courses — namely protists (algae and non-photosynthetic microbial eukaryotes) — which occur in oceans, soils, lakes, animal guts and many other environments.
Course Objective	To acquire a basic understanding of: 1. Evolutionary origin, history and diversity of eukaryotes and their genomes, organelles, biochemistry, cells, and organismic biology (Part I: Week 2–7) 2. Major eukaryotic lineages and important eukaryotic microbes (Part II: Week 9–12, written assignment and oral presentation) 3. Relationships between eukaryotic microbes and Earth, ecosystems, humans, and other microbes (Part III: Week 13 [and 9–12])
Course Requirement	General Biology or equivalent courses. Genomics, Cell Biology, Evolutionary Biology, and Ecology are relevant, but not required.
References	1. Archibald et al., Eds., Handbook of the Protists (Springer, ed. 2nd, 2017). 2. Adl et al., Revisions to the classification, nomenclature, and diversity of eukaryotes. J. Eukaryot. Microbiol. 66, 4–119 (2019). 3. Lee, Phycology (Cambridge University Press, Cambridge, ed. 4, 2008). 4. Willey et al., Prescott's Microbiology (McGraw-Hill Education, ed. 10, 2017). 5. Alberts et al., Molecular Biology of the Cell (Garland Science, ed. 6, 2015). 6. Other selected review articles and research papers. 7. Adl, Protistology (Elsevier, ed. 1, 2024)
Designated Reading	Course slides (midterm and final exam) Additional reading (final exam): Sun et al., Host range and coding potential of eukaryotic giant viruses. Viruses 12, 1337 (2020). Wells et al., Algae as nutritional and functional food sources: revisiting our understanding. J. Appl. Phycol. 29:949–82 (2017).

Progress

Week	Date	Topic
Week 1	Sept. 6	Introduction
Week 2	Sept. 13	Origin and early evolution of eukaryotes
Week 3	Sept. 20	Evolution of endosymbiotic organelles
Week 4	Sept. 27	Cellular structures
Week 5	Oct. 4	Metabolism, nutrition and cellular interactions
Week 6	Oct. 11	Demonstration Day: flow cytometry and cell sorting for microbial eukaryotes (R220 and R106 at Institute of Plant and Microbial Biology, Academia Sinica)
Week 7	Oct. 18	Cell cycle and life cycle
Week 8	Oct. 25	**Midterm exam**
Week 9	Nov. 1	Card Game Day: survival of microbes
Week 10	Nov. 8	Amorphea (Opisthokonts and Amoebozoans)
Week 11	Nov. 15	Archaeplastids and SAR
Week 12	Nov. 22	Haptists, Cryptists, Discobans, and other eukaryotes
Week 13	Nov. 29	Protists, Earth and humans
Week 14	Dec. 6	Presentation Day 1
Week 15	Dec. 12	Presentation Day 2; Written assignment due
Week 16	Dec. 20	**Final exam**

Grading

NO	Item	Pc	Explanations for the conditions
1	Written assignment	20%	Short research proposal
2	Oral presentation	15%	
3	Midterm	20%	Materials from weeks 1-7
4	In-class participation	10%	
5	Attendance and punctuality	10%	
6	Final exam	25%	Materials from weeks 9-13 (incl. concepts from weeks 1-7) and two assigned papers

Office Hour

Remarks	Instructor: Chuan Ku chuanku@gate.sinica.edu.tw TA: Ming-Wei Lai mwlai@gate.sinica.edu.tw (02-27871147)