Studying Animal Evolution of Development and Protist Cell Biology with OMICS Data						
Identification number	Workload	Credit points	Term of studying		Frequency of occurence	Duration
MN-B-SM (G 3)	360 h	12 CP	1st or 2nd term of studying		Summer term, 1st half	7 weeks

1	Type of lessons	Contact times	Self-study times	Intended group size
	a) Lectures	12 h	30 h	max. 12
	b) Practical/Lab	97 h	145 h	max. 12
	c) Seminar	30 h	36 h	max. 12

2	Aims of the module and acquired skills
	Students who successfully completed this module …
	• have developed an understanding of animal and protist evolution and the diversity of these groups, and the underlying theories on fundamental concepts and theoretical models in molecular evolution.
	• have gained insight into contemporary topics of evolutionary developmental biology (EvoDevo), and are accustomed to molecular and computational methods in EvoDevo.
	• have become accustomed with powerful analysis tools on modern Unix based computer systems and will be able to use these systems to assemble genomes and transcriptomes, conduct downstream analyses, and to interpret and document their research.
	• have gained advanced insights into the handling and exploration of large-scale sequencing data in approaches to tackle the diverse and challenging questions evolutionary research Biologists are facing today.
	• have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.
	• are able to transfer skills acquired in this module to other fields of biology.

3	Contents of the module
	• Animal evolution, genome evolution, evolution of the molecular machinery of development
	• Protist evolution and diversity, molecular components underpinning protistan feeding strategies and cell-cell interactions
	• Diversity of carbohydrate-active enzmyes and their identification in OMICS data
	• Applications of 2nd and 3rd generation sequencing in EvoDevo-research
	• Laboratory methods: gene expression visualisation
	• Introduction to computer-based analyses of large-scale omics data

4	Teaching/Learning methods
	• Lectures; Practical/Lab (Project work); Seminar; Computer exercises; Guidance to independent research; Training on presentation techniques in oral and written form

5	Requirements for participation
	Enrollment in the Master´s degree course "Biological Sciences"
	Additionally recommended: Basic knowledge of Unix based computer systems will greatly facilitate initial participation, but is not mandatory.

6	Type of module examinations
	The final examination consists of three parts: Two hours written examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)
7	Requisites for the allocation of credits
	Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	Compatibility with other Curricula
	None
9	Significance of the module mark for the overall grade
	15 % of the overall grade (see also appendix of the examination regulations)
10	Module coordinator
	Dr. Philipp Schiffer, phone 470-3238, e-mail: p.schiffer@uni-koeln.de
11	Additional information
	Subject module of the Master´s degree course "Biological Sciences", **Specialization:** (G) Molecular and Developmental Genetics
	Participating faculty: Dr. M. Pechmann, Prof. Dr. S. Roth, Dr. P. Schiffer, Dr. S. Hess, Dr. J. Gerbracht
	Literature:
	• Information about textbooks and other reading material will be given on the ILIAS representation of the course (https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html)
	General time schedule: Week 1-6 (Mon.-Fri.): Lectures, Practical/Lab (Project work); (daily from approximately 9 a.m. to 5 p.m. including lunch break, times may vary depending on project's tasks) as well as writing seminar paper and preparation for the seminar talk; Week 7 (Mon.-Thu.): Preparation for the written examination
	Note: The module contains computer-based practicals/research as a main component.
	Introduction to the module: April 12, 2021 at 9 a.m., Cologne Biocenter, lecture hall 0.024 (ground floor) or online (in this case, further information/link will be sent to your Smail-Account); for preparation to the module before this introduction see ILIAS link under literature.
	Written examination: May 31, 2021, second/supplementary examination August 06, 2021; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.

Corona note! Depending on the Corona situation during the summer term, practical work may be skipped either totally or in part. In this case, some or all practical parts will be replaced by adequate alternatives so that (i) the workload and (ii) the principle content of the modules remained unchanged.