

				Syll	abus 2	2020/2	2021							
Teaching cycle: 2020-2025														
				Descr	iption	of the	cours	se 🛛						
									Group	o of de	tailed e	educat	ion res	ults
								Group code Group name						
Module/Course	MO	MOLECULAR BIOLOGY, GENETICS						В		The	The scientific basis of		sis of	
											med	medicine Preclinical		
										C	: scie	nces		
Faculty		Der	ntistry											
Major		der	ntistry											
Unit realizing the subje	ct	Dep	partme	ent of B	iology	and N	ledica	al Paras	itology	,				
Specialties		Not	: applic	able										
Level of studies		Uni	form r	nagiste	er stud	ies □*								
		1 st (degree	e studie	es 🗌									
		2 nd	degree	e studi	es 🗆									
		3 rd	degree	e studie	es 🗌									
		pos	postgraduate studies X											
Form of studies		X f	X full-time											
Year of studies		I (fi	I (first) Semest					er	r X Winter					
									Summer					
Type of course		Χo	X obligatory											
		🗆 lii	□ limited choice											
		free choice / elective												
Course		□n	🗆 major X basic											
Language of instructior	า	□ P	□ Polish X English □ other											
* mark \square with an X														
				N	umber	⁻ of ho	urs							
				Fo	rm of	educa [.]	tion		-					
Unit teaching the			isses (AC)	- not clinical	s (CC)	isses (LC)	ulated C)	es with Patient	ses – magister	ige Course (FLC)	ition obligatory	ctice (VP)	ident's own	
course	Lectures (L)	Seminars (SE)	Auditorium cla	Major Classes (MC)	Clinical Classe	Laboratory Cla	Classes in Simu Conditions (CS	Practical Class (PCP)	Specialist Class studies (SCM)	Foreign langua	Physical Educa (PE)	Vocational Pra	Self-Study (Stu work)	E-learning (EL)
Winter Semester 40														
Direct (contact) education	-	-	-	18	-	-	-	-	-	-	-	-	-	-
Online learning (synchronous)	10	5	-	7	-	-	-	-	-	-	-	-	-	-
Distance learning (asynchronous)	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix to Resolution No. 2186 of Senate of Wroclaw Medical University of 1 July 2020

Summer Semest	er																	
Direct (contact)		_		_				_	_	_				_	_			_
education		-	-	-	-	•	-	-	-	_	-	-		-	-	-		-
Online learning		_		_	_	_		_	_					_		_		_
(synchronous)		-	-	-	-	-		-	-	_		-		-	-	-		-
Online learning		_	_	-	-	_		.	_	_				_	_	_		_
(asynchronous)			_															
TOTAL per year:	40																	
Direct (contact)		-	-	_	18	_		_		-	-	_		_	-	-		_
education					10													
Online learning		10	5	_	7	-		_		-	-	_		-	-	-		-
(synchronous)			-		-								_					
Online learning		-	_	_	-	_		-		-	-	-		-	-	-		-
(asynchronous)			•.															
Educational obje	ectives (n	nax. 6	items	5) 			: .					- + - 1	- 1-1-					
CI. Providing stu			10WIEC	ige ot	model	m ger	ietic	.s ar	iu its	expe	erime	ital me	ein(Jas.	r	,		I.
C2. Preparation	of the ba	asis to	or clinio	cal kno	wiedg	ge pas	sed	on	in suk	sequ	uent y	ears o	r sti	udies	tor u	nders	tan	iding
issues in the fi	ield of	epide	miolog	gy and	d path	nogen	esis	of	hum	an d	diseas	es, clir	nica	l ge	netics	, as	we	ell as
pharmacology a	nd medi	cal di	agnost	tics.														
C3. Education of	f student	ts in tl	he bas	ics of I	medica	al para	asito	olog	y, epi	idem	iology	/ and p	rev	entic	on of p	barasi	tic	
diseases.																		
Education resul	t matrix [·]	Education result matrix for module/course in relation to verification methods of the intended education result																
			ouule/	course	e în rel	ation	to v	erifi	icatio	n me	thods	of the	int	ende	d edu	catior	n re	esult
			ouuley	course	e in rel and	ation I the t	to v ype	erifi of c	icatio class	n me	thods	of the	int	ende	d edu	catior	ר re	esult
	Number	of		course	and	ation I the t	to v ype	erifi of c	icatio class	n me	ethods	of the	int catio	ende	a edu	catior	n re	sult
Number of course	Number major	of	Stude	ent who	e in rel and	ation I the t etes th	to v ype e	erifi of c	icatio class	n me Me of	ethods ethods intend	of the	int catio	ende	Form c	of dida	n re	class
Number of course education result	Number major educatio	of	Stude	ent who ule/cou	e in rel and comple	ation I the t etes th ws/is al	to v ype e ble to	erifi of c	icatio class	n me Me of res	ethods ethods intend sults (fo	of verifient of ve	cation nd	ende	d edu Form c **enter	of didac	n re	class class
Number of course education result	Number major educatio result	of on	Stude	ent who ule/cou	completers of the second secon	ation I the t etes th ws/is al	to v ype e ble to	erifi of c	icatio class	n me Mi of res su	ethods intend sults (fo mmaris	of verified of verified ed educa prming a sing)	int cation ation nd	on n	G edu Form c **enter	of didad	n re	class class
Number of course education result W01	Number major educatio result B.W4 .	of	Stude modu	ent who ule/cou	e in rei and comple rse know the str	ation I the t etes the ws/is al	to v ype e ble to e and	erifi of c	icatio class	n me Mi of re: su Wi	ethods intend sults (fo mmaris	of verified ed educa prming a sing) cest or	int cation ation nd	on n	G edu Form c **enter MC, L	of didad	n re	class iation
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Number of course education result W01	Number major educatio result B.W4. B.W14	of on	Stude moduley - des func com body func reac carb horn - def biolo	ent who ule/cou scribes tions o pound: y, in pa tions, r tions o ohydra nones; fines th	the str f impo s prese rticular netabo f prote tes, lip e basic	ation I the t etes the ws/is al cucture rtant of r the p olism a ins, nu ids, en conce gy;	to v ype e bble to chen he h nrope uclei nzym	erifi of c o d nical numa ertie ener c ac nes a of	an es, gy of ids, and	n me of res su wi co te	ethods intend sults (for mmaris fitten f lloquin st exan	of the of verifi- ed educ: orming a sing) rest or um, wri n rest or um, wri n	int catio ation nd tter	ende	Form c **enter MC, L	of didac	ctic brev	class iation
Number of course education result W01 W 02	Number major educatio result B.W4. B.W14 B.W15	of on	Stude moduley - des func com body func reac carb horn - def biolo	ent who ule/cou scribes tions o pound: y, in pa tions, r tions o ohydra nones; fines th ogy and scribes	the str f impo s prese rticular metabo f prote tes, lip e basic l ecolo the int	ation I the t etes the ws/is al cucture rtant of r the p olism a ins, nu ids, en conce gy;	to v ype e ble to chen he h no e uclei nzym epts	erifi of c o d nical numa ertie ener c acc nes a of	s size	n me of res su wr co te wr	ethods intend sults (for mmaris fitten f lloquin st exan fitten f lloquin st exan	e of the of verifi- ed educ: orming a sing) rest or um, wri n rest or um, wri n	int catio ation nd tter	ende	MC	of didao	n re	class iation
Number of course education result W01 W 02 W03	Number major educatio result B.W4. B.W14 B.W15	of on	Stude moduley - des func com body func carb horn - def biolo	ent who ule/cou scribes tions o pounds y, in pa tions, r tions o ohydra nones; fines th ogy and scribes veen of	the str f impo s prese rticular netabo f prote ites, lip e basic l ecolor the int	ation I the t etes th ws/is al cucture rtant o rtant o r the p olism a ins, nu ids, er conce gy; eerrela ns in t	to v ype e ble to chen he h nrope und e uclei nzym epts	erifi of c o d nical auma ertie ener, c ac of of	s	n me off ressuut suut co te win co te win co	ethods intends sults (for mmaris fitten f lloquin st exan fitten f lloquin st exan	e of the of verificed educe orming a sing) cest or um, wri m cest or um, wri m cest or um, wri	int catio ation nd tter	ende	MC	of didac	tic brev	class iation
Number of course education result W01 W 02 W03	Number major educatio result B.W4. B.W14 B.W15	of on	Stude moduley Stude moduley - des func com body func reac carb horn - def biolo - des betw ecos	ent who ule/cou scribes tions o pound: y, in pa tions, r tions o ohydra nones; fines th ogy and scribes veen or ystem;	the str f impo s prese rticular metabo f prote tes, lip e basic l ecolor the int	ation I the t etes the ws/is al cucture rtant of rtant of r the p olism a ins, nu olish, er sins, er conco gy; eerrela ns in th	to v ype e ble to chen he h rope uclei nzym epts tion	of c o d nical numa ertie ener c ac nes a of	s s icatio class an s s	n me off resisu su wr co te wr co te wr co	ethods intends sults (for mmaris fitten f lloquin st exan fitten f lloquin st exan	e of the of verificed educ: orming a sing) sest or um, wri m sest or um, wri m	int catio ation nd tter	n n	MC	of didac	n re	class iation
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Number of course education result W01 W 02 W03 W04	Number major educatio result B.W4. B.W14 B.W15 B.W15	of on	Stude modul - des func com body func reac carb horn - def biolo - des betw ecos - exp	ent who ule/cou scribes tions o pound: y, in pa tions, r tions o ohydra nones; fines th ogy and scribes veen of ystem; plains in	the str f impo s prese rticular metabo f prote tes, lip e basic l ecolo; the int rganism	ation I the t etes th ws/is al ucture rtant o rtant o r the p olism a ins, nu ids, er conce gy; eerrela ns in th	to v ype e ble to chen he h rope uclei nzym epts tion: he	of c o d nical numa ertie ener, c ac of of	s	Million Methods and a second s	ethods intends intend sults (for mmaris itten f lloquin st exan itten f lloquin st exan itten f	of the of verificed educator orming a sing) sest or um, wri m sest or um, wri m sest or um, wri m	tter	ende	MC	of didac	n re	class iation
Number of course education result W01 W 02 W03 W04	Number major educatio result B.W4. B.W14 B.W15 B.W15	of on	Stude moduley - des func com body func reac carb horn - def biolo - des betw ecos - exp para	ent who ule/cou scribes tions o pound: y, in pa tions, r tions o ohydra nones; fines th ogy and scribes veen of ystem; blains in site-ho	the str f impo s prese rticulai metabo f prote te basic d ecolog the int rganisn	ation I the t etes the ws/is al cucture rtant of r the p olism a ins, nu ids, en conce gy; eerrela ns in the ions ir em;	to v ype e ble to chen he h uclei nzym epts tion: he	erifi of c o d nical numa ertie ener, c ac nes a of	icatio class	n me of res su wi co te wi co te wi co	ethods intends intend sults (for mmaris fitten f lloquin st exan fitten f lloquin st exan fitten f lloquin fitten f lloquin	e of the of verifi- ed educ: orming a sing) rest or um, wri m rest or um, wri m rest or um, wri	int catio ation nd tter tter	ende	MC	of didac	n re	class iation

	UNIWER IM. Plastów S	SYTET N Śląskich we v	EDYCZNY Wrocławiu	Appendix to Resolution No. 2186 of Senate of Wroclaw Medical U of 1 July 2020	Iniversity
W05	B	.W17.	 describes and explains selected issues in the field of genetics and molecular biology; 	written test or colloquium, written test exam	MC, SE, L
W06	C.	.W1.	knows the types and species and the structure of viruses, bacteria, fungi and parasites, their biological characteristics and mechanisms of pathogenicity;	written test or colloquium	МС
W07	C.	.W3.	 describes the basics of epidemiology of viral and bacterial infections, fungal and parasitic infections and ways of their spread in the human body; 	written test or colloquium	МС
W08	C.	.W6.	 describes external and internal pathogens; 	written test or colloquium	MC, SE, L
U01	B.	.U4.	- can use biological and ecological concepts in the context of human - living environment;	independent solving of tasks prepared by the teacher	MC, SE
U02	B	.U5.	- uses knowledge of genetics and molecular biology in clinical work;	solving genetic crosswords and explaining issues during classes	MC, SE
U03	C.	.U1.	- explains how to collect a properly selected type of biological material for microbiological (parasitological) examination depending on the location and course of infection;	oral statement during classes;	МС
K01			 creates the need for learning, inspires and organizes the process of self and other people's learning; shows health-promoting behavior 	presents a lecture in the group's forum on the basis of self- prepared materials;	SE, MC
K02			 actively cooperates in a group in order to solve problems, taking care of his own safety and of those around him; 	observation of the student while working on microscopy classes and making drawings;	MC
КОЗ			- actively participates in searching for materials for classes expanding knowledge and skills, and critically evaluates the source of information	presentation of individually searched information in the group forum during classes;	SE, MC
 ** L - lea patient; 	cture; SE - semi ilist classes (ma PE – physical e mark on sca	nar; AC – audit gister studies); ducation (oblig Ile 1-5 how t	orium classes; MC – major classes (non-clir CSC – classes in simulated conditions; FLC (atory); VP – vocational practice; SS – self-s he above effects place your classes	ncai); CC – clinical classes; LC – C – foreign language course; P tudy, EL – E-learning . s in the following catego	- laboratory classes; SCM ICP practical classes with ries:
comm Knowle	unication of edge: 5	knowledge,	skills or forming attitudes:		

Skills: 3	
Social competences: 1	
Student's amount of work (balance of ECTS points)	
Student's workload	Student Workload (h)
(class participation, activity, preparation, etc.)	
1. Contact hours:	18
2. Online learning hours (e-learning):	22
3. Student's own work (self-study):	25
Total student's workload	65
ECTS points for module/course	6.0
Comments	
Content of classes (please enter topic words of specific classes divided into their did	actic form and remember how it is
translated to intended educational effects)	
Lectures: (10 hours – on-line; synchronous mode – by BBB, Microsoft Te	ams or another platform)
Lecture 1. DNA, RNA, chromatin, chromosomes. Karyotype, organization of	of human genome, mitochondrial
genome (2 h).	
Lecture 2. Replication of DNA in Eukaryotes. Transcription, translation. Re	gulation of gene expression in
Eukaryotes (2 h).	
Lecture 3. DNA diversity, DNA mutations, mutagens, the influence of med	icines, chemicals, physical factors,
and environmental pollution. DNA repair mechanisms (2 h).	
Lecture 4. Examples of genetic diseases including X-linked diseases (2 h).	
Lecture 5. Basic methods of molecular biology and their applications (2 h)	
Seminars: (5 hours) – on-line – synchronous mode, by BBB or Microsoft	Teams platform)
• Seminar 1. (week 12; 2h) Colloquium – molecular genetics. HUMAN GENETICS: Types and mechanis correct human karyotype. Chosen diseases caused by numerical mutation syndrome, Patau syndrome, Turner syndrome, Klinefelter syndrome; and structural mutations: Wolf-Hirschhorn syndrome, Cri-du-chat syndrome, F syndrome.	m of mutation formation. The s: Down syndrome, Edwards chosen diseases caused by Prader-Willi syndrome, Angelman
• Seminar 2. (week 13; 2h) HUMAN GENETICS: Mechanisms of gene mutations. Chosen autosomal in Huntington's chorea, Alzheimer's syndrome, achondroplasia, Marfan synd recessive: phenylketonuria, alkaptonuria, albinism, cystic fibrosis, galactos hemoglobinopathies.	herited diseases – dominant : drome, polydactyly, syndactyly; and semia, lipidosis
• Seminar 3. (week 14; 1h)	
Practical classes: (25 hourse 18 hourset (contact) classes: 7 hourse line	superronous mode by DDD or
<u>Produced Classes:</u> (25 nours; 18 n - direct (contact) classes; / n – on-line -	- synchronous mode, by BBB or
Porositelegy source contents: life suches and much lists lite to the	posis and diagnostic factures of the
parasitology course contents: life cycles, geographical distribution, diagr parasites' developmental forms, detection (what form, in what biolog pathogenicity, epidemiology, prevention of in	ical material), disease symptoms, nfection
 Practical 1. (week 1; 2h) direct (contact) classes Organizational part - reading the internal regulations of the Biology Depar Syllabus content and criteria for passing the subject. PARASITOLOGY: Prot vaginalis, Trichomonas tenax, Giardia intestinalis, Trypanosoma brucei ga Practical 2. (week 2: 2h) direct (contact) classes 	tment; information about the ozoa – <u>Flagellates</u> : <i>Trichomonas</i> mbiense



PARASITOLOGY: Protozoa – Amoebae: Entamoeba histolytica/dispar, Entamoeba gingivalis, and Apicomplexans: Plasmodium spp., Toxoplasma gondii • Practical 3. (week 3; 3h) direct (contact) classes Colloquium – protozoa. PARASITOLOGY – <u>Trematoda</u>: Fasciola hepatica, Clonorchis sinensis, Schistosoma spp.; • Practical 4. (week 4; 2h) direct (contact) classes **PARASITOLOGY** – **Cestoda**: Taenia saginata, Taenia solium, Hymenolepis nana, Echinococcus granulosus, Echinococcus multilocularis • Practical 5. (week 5; 2h) direct (contact) classes PARASITOLOGY – Nematoda: Ascaris lumbricoides hominis, Enterobius vermicularis, Trichuris trichiura, Trichinella spiralis • Practical 6. (week 6; 3h) direct (contact) classes Colloquium – worms. TRANSMISSION GENETICS: Basic concepts and definitions of transmission genetics. Mendel's laws. Practical use of the laws of classical genetics in solving tasks related to mono- and dihybrid crosses. Codominance, multiple alleles; Gene cooperation e.g. epistasis, polygenes, complementary genes. • Practical 7. (week 7; 2h) direct (contact) classes TRANSMISSION GENETICS: The cell's life cycle. The analysis of the stages of the animal cell division. Meiosis and gametogenesis (oogenesis and spermatogenesis). • Practical 8. (week 8; 2h) direct (contact) classes TRANSMISSION GENETICS: Morgan theory of chromosomal inheritance. Practical solving of tasks related to linked genes. Sex determination. Barr body and Lyon hypothesis. • Practical 9. (week 9; 3h) synchronous mode, by BBB or Microsoft Teams platform Colloquium – transmission genetics. MOLECULAR GENETICS: DNA and RNA structure. Chromatin structure and organization. DNA replication in Prokaryotes. • Practical 10. (week 10; 2h) synchronous mode, by BBB or Microsoft Teams platform **MOLECULAR GENETICS:** The genetic code features and exceptions. Protein synthesis in living organisms (transcription and translation) with the factors and enzymes involved. • Practical 11. (week 11; 2h) synchronous mode, by BBB or Microsoft Teams platform **MOLECULAR GENETICS:** The theory of operon - types of operons and their role in gene expression regulation in Prokaryotes (induction, glucose catabolic repression, repression, attenuation)

Other - - - - - -

Basic literature (list according to importance, no more than 3 items)

- Cisowska A., Hendrich A., Kicia M., Leszczyński P., Szydłowicz M., Tichaczek-Goska D., Wesołowska M., Wojnicz D. "Medical Biology for students of Medicine and Dentistry English Division", Wrocław Medical University, Wrocław, 2019
- 2. Bogitsch B.J., Carter C., Oeltmann T "Human parasitology" 5th edition, Academic Press 2018 or elder
- 3. Klug WS, Cummings MR, Spencer ChA, Palladino, Killian D "Concepts of genetics", 12th edition, Pearson, 2019 or elder

Additional literature and other materials (no more than 3 items)

- 1. McLennan A.G., Bates A.D., Turner P.C., White M.R.H.: BIOS Instant notes: Molecular Biology. Garland Science, NY & London, 2013
- 2. Tobias E.S, Connor M., Ferguson-Smith M. "Essential medical genetics" 6th edition, Wiley-Blackwell, 2011
- 3. Campbell NA, Reece JB, Cain ML et al. Biology. A global approach. Pearson, 2016 (11th edition)

Didactic resources requirements (e.g. laboratory, multimedia projector, other...)

Classroom equipped with laptop, multimedia, microscopes. Access to the Internet and a platform enabling virtual teaching in a synchronous version, eg BBB or Microsoft Teams or other

Preliminary conditions (minimum requirements to be met by the student before starting the module/course)



Knowledge of genetics and parasitology at the high school level.

Conditions to receive credit for the course (specify the form and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be med by the student to pass it and criteria for specific grades)

Passing 5 partial tests (transmission genetics, molecular genetics, human genetics, protozoa, helminths) allows for getting credit and enter the final exam. The attendance at all classes in accordance with the study regulations. The percentage criteria for passing partial tests are identical to the examination criteria. A student can be exempted from the final exam with a very good grade (5.0) in two cases: 1) when obtains an average of at least 4.75 from all (5) partial tests; or 2) when a student fails the colloquium once but receives a very good grade (5.0) from the re-take of this colloquium and very good grades (5.0) from each of the other four colloquiums.

In the absence of a student resulting e.g. the disease, because of another important reason (justified by the sick leave, or other official document), the student is obliged to make up abandoned classes preparing a presentation or essay in electronic form on a topic given by the teacher covering abandoned classes, or participating in the classes of another group - if possible, and after obtaining the teacher's permission. In case of cancellation of classes for reasons beyond the control of students, e.g. Rector's Day, Dean's hours, etc., at the students' request, the classes will be conducted at another time agreed with the person conducting the classes.

The exam takes the form of a test (single choice) in the field of genetics (lectures and seminars). The final mark of the subject is the sum of points obtained during the exam (max. 80) and points obtained after converting grades from tests in parasitology during the semester (max. 20).

Grade:	Criteria (only for courses/modules ending with an examination)
Very Good	02.100%
(5.0)	92-100%
Good Plus	84 Q19/
(4.5)	64-91/0
Good	76.92%
(4.0)	70-85%
Satisfactory Plus	68 75%
(3.5)	08-7570
Satisfactory	60.67%
(3.0)	00-07 //
	Criteria (only for courses/modules ending with e credit)
Credit	

Grade:	Criteria (examination evaluation criteria)
Very Good	02.100%
(5.0)	92-100%
Good Plus	84.019/
(4.5)	84-91%
Good	76-83%



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(4.0)	
Satisfactory Plus	68 75%
(3.5)	08-7576
Satisfactory	60.67%
(3.0)	00-07%
Unit realizing the	Department of Riology and Medical Parasitology
subject	Department of blology and medical Parasitology
Unit address	J. Mikulicza-Radeckiego Street 9, Wroclaw
Telephone	tel. 71 784 15 12 (secretariat)
E-Mail	e-mail: malgorzata.pekalska-cisek@umed.wroc.pl

Person responsible for module	Prof. dr hab. Andrzej Hendrich
Coordinator	Prof. dr hab. Andrzej Hendrich
Telephone	tel. 71 784 15 12 (secretariat); 71 784 15 11
E-Mail	e-mail: andrzej.hendrich@umed.wroc.pl

List of persons conducting specific classes								
Full name	Degree/scientific or professional title	Discipline	Performed profession	Form of classes				
Andrzej Hendrich	Prof. dr. hab.	medical sciences	academic teacher	L				
Dorota Wojnicz	Dr. hab.	medical sciences	academic teacher	SE				
Agnieszka Cisowska	Dr.	medical sciences	academic teacher	MC				
Maria Wesołowska	Dr.	medical sciences	academic teacher	MC				
Dorota Tichaczek-Goska	Dr.	medical sciences	academic teacher	МС				
Magdalena Szydłowicz	Dr.	medical sciences	academic teacher	MC				
Przemysław Leszczyński	MSc.	medical sciences	academic teacher	MC				

Date of Syllabus development

Syllabus developed by

30.09.2020

Dr Dorota Tichaczek-Goska

Signature of Head of teaching unit

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Signature of Faculty Dean



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