UMCS

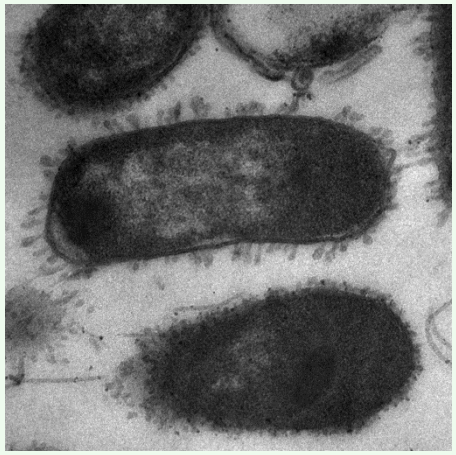
WYDZIAŁ BIOLOGII I BIOTECHNOLOGII

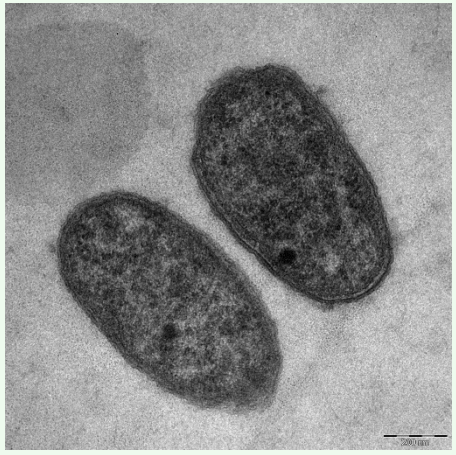
Department of Genetics and Microbiology
Institute of Biological Sciences
UMCS

Address: Akademicka Str.19, second floor, so-called: "New Biology,, building

Main research topics	Research workers
Structural and functional genomics of *Rhizobium*: identification and analysis of the functions of genes responsible for plasmid replication and segregation, biosynthesis and transport of surface polysaccharides, and symbiotic interactions with legume plants, genome sequencing, high-throughput analysis of gene expression (RNAseq – NGS), metagenomics	• dr hab. Andrzej Mazur, prof. UMCS • dr hab. Małgorzata Marczak • dr Piotr Koper • dr Kamil Żebracki • dr Magdalena Wójcik
Chemical and structural analysis of bacterial surface components with particular emphasis on the structures and biological properties of lipopolysaccharides	• prof. dr hab. Adam Choma • dr hab. Iwona Komaniecka, prof. UMCS • dr hab. Jolanta Kutkowska, prof. UMCS • dr hab. Magdalena Karaś • dr Katarzyna Zamłyńska
Biodiversity and phylogenesis of nodule bacteria; molecular taxonomy of nodule bacteria, genomics of bacteria and bacteriophages	• dr hab. Jerzy Wielbo, prof. UMCS • dr hab. Sylwia Wdowiak-Wróbel, prof. UMCS • dr hab. Michał Kalita • dr Monika Marek-Kozaczuk • dr Dominika Kidaj
Structure of lipids and lipopolysaccharides of *Legionella* spp. and *Aeromonas* spp. and their importance in pathogenesis	• dr hab. Marta Palusińska –Szysz, prof. UMCS • dr hab. Anna Turska-Szewczuk, prof. UMCS
Biofertilizers - ecological preparations stimulating the growth and yielding of crops	• dr hab. Jerzy Wielbo, prof. UMCS • dr Dominika Kidaj

Staff at the Department of Genetics and Microbiology (potential supervisors of diploma theses)



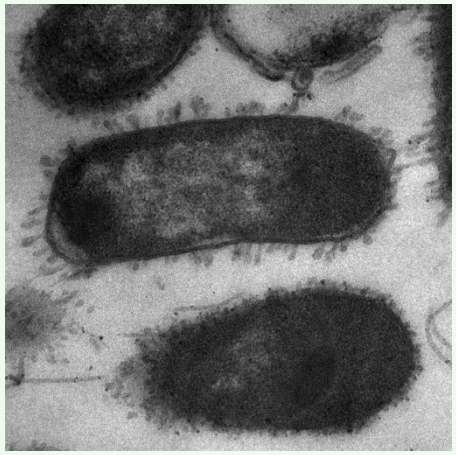


Bacteria
TEM images
(foto: KGiM)

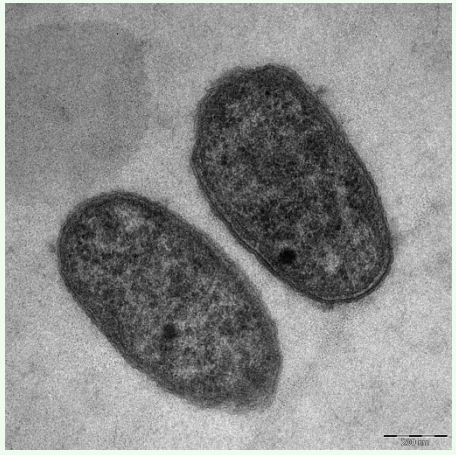
prof. dr hab. Adam Choma - head of the Department
dr hab. Andrzej Mazur, prof. UMCS
dr hab. Iwona Komaniecka, prof. UMCS
dr hab. Jolanta Kutkowska, prof. UMCS
dr hab. Marta Palusińska-Szysz, prof. UMCS
dr hab. Anna Turska-Szewczuk, prof. UMCS
dr hab. Jerzy Wielbo, prof. UMCS
dr hab. Michał Kalita
dr hab. Magdalena Karaś
dr hab. Małgorzata Marczak
dr hab. Sylwia Wdowiak-Wróbel, prof. UMCS

Persons who conduct microbiological and immunochemical research
Persons who conduct research mainly in the field of genetics and taxonomy of bacteria

Staff at the Department of Genetics and Microbiology (potential supervisors of undergraduate theses)



dr Monika Marek-Kozaczuk
dr Dominika Kidaj
dr Piotr Koper
dr Magdalena Wójcik
dr Katarzyna Zamłyńska
dr Kamil Żebracki



Bacteria
TEM images
(foto: KGiM)

Persons who conduct microbiological and immunochemical research
Persons who conduct research mainly in the field of genetics and taxonomy of bacteria

Staff and PhD students of the Department of Genetics and Microbiology, May 2021

Przykładowe tytuły prac magisterskich

no	the supervisor of the thesis	the title of the work
1	dr hab. Iwona Komaniecka, prof. UMCS	Interaction of endophytic bacteria with plant pathogens on the example of tomato endophytes and *Agrobacterium tumefaciens*
2	dr hab. Jolanta Kutkowska, prof. UMCS	Drug resistance and virulence factors of *Enterobacteriaceae* isolated from birds
3	dr hab. Jerzy Wielbo , prof. UMCS	Study of the interaction among bacterial endophytes of *Chamaecytisus albus*
4	dr hab. Anna Turska-Szewczyk, prof. UMCS	Virulence factors and drug resistance profile of pathogenic bacteria for fish of the genus *Aeromonas* sp.
5	dr hab. Andrzej Mazur, prof. UMCS	Functional analysis of gene clusters related to the biosynthesis of surface polysaccharides of soil bacteria of the genus *Rhizobium*
6	dr hab. Małgorzata Marczak	Functional proteomics of glycosyltransferases involved in exopolysaccharide biosynthesis in *Rhizobium*
7	prof. dr hab. Adam Choma	Investigation of membrane lipids of endophytic bacteria of the genus *Pseudomonas*
8	dr hab. Marta Palusińska-Szysz, prof. UMCS	Structure and importance of surface components of *Legionella* bacteria in interaction with the host cell

Examples of bachelor's theses titles

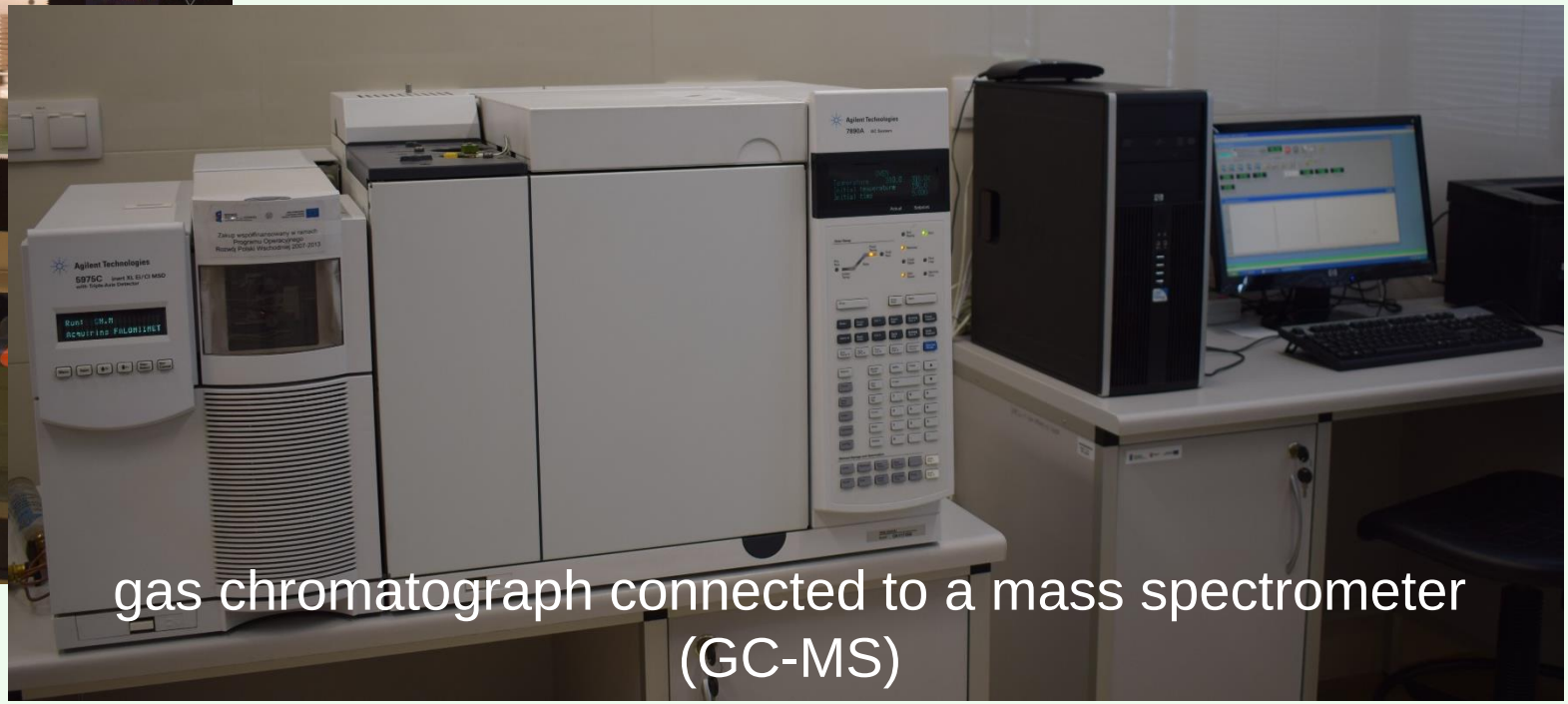
Lp.	tutor	thesis topic
1	dr Kamil Żebracki	Circadian rhythms in bacteria
2	dr Magdalena Wójcik	Biosensors in magnetotactic bacteria
3	dr Piotr Koper	Bakterie w walce przeciw wirusom - bakteryjne wiperyny
4	dr Katarzyna Zamłyńska	The importance of endophytic bacteria in phytoremediation of contaminated soils

The tutors often leave a choice the subject of the work to students, outlining only the "boundary conditions":
E.g.: "The work should concern medical microbiology„ or
"Work should be in the field of human genetic diseases"

Research projects carried out at the Department with the participation of students

Project leader: dr hab. Małgorzata Marczak	**Grant: NCN OPUS 14:** „Comprehensive analysis of glycosyltransferases responsible for the biosynthesis of active bacterial exopolysaccharide in symbiosis with clover "
Project leader: dr hab. Marta Palusińska-Szysz, prof. UMCS	**Grant: NCN OPUS 14:** "Bacterial determinants of increased virulence of *Legionella pneumophila* serotype 1 strains"
Project leader: dr hab. Iwona Komaniecka, prof. UMCS	**Grant: NCN OPUS 16:** "The importance of the composition of the outer membrane of *Agrobacterium tumefaciens* in the process of infection of crops"
Project leader: dr hab. Michał Kalita	**Polish-South African research projects (NCBiR) (2019–2022):** „Composition and function of the root nodule microbiome of *Trifolium rubens* and *T. africanum*„ (completed in 2021)
Project leader: dr Katarzyna Zamłyńska	**Miniatura-4**: „Methylobacterium oryzae as a plant growth biostimulator - studies on the *Arabidopsis thaliana* model*”* (completed in 2021)
Project leader: prof. dr hab. Zofia Piotrowska-Seget (UŚ) prof. dr hab. Adam Choma (UMCS)	**Grant: NCN OPUS 19:** Molecular characteristics of outer membrane vesicles of endophytic bacteria of the *genus Pseudomonas* and *Rhizobium* and their role in stimulating the induced systemic response in plants

Examples of KGiM equipment



Examples of KGiM equipment

Mass spectrometer with very high resolution

Examples of KGiM equipment

Multifunctional plate reader

tissue disintegrator

Eight-channel DNA sequencer

Examples of KGiM equipment

Work in sterile conditions - laminar chamber

Photographs showing the complete hardware equipment and laboratories as well as student laboratories of the Department of Genetics and Microbiology can be found on the Faculty of Biology and Biotechnology website in the bookmark DESCRIPTION OF THE INFRASTRUCTURE

https://www.umcs.pl/pl/opis-infrastruktury,21138.htm

We cordially invite students to the Department of Genetics and Microbiology