



Site plan of the LIMES-GRC
animal husbandry area

March 2024

To whom it may concern,

you requested a health monitoring report of our facility. Please find attached:

1. Housing information
2. Latest health monitoring report of our [facility in total](#). This is thought to give you an impression of the overall hygiene status of the facility. Please note that our quarantine room ("dirtiest" room) is included in this report.
3. Latest health monitoring report of the room the desired mice live in

Please note as well that we claim our animals to be specific pathogen free (SPF). This implies that mice are free of defined murine pathogens (list of pathogens see FELASA guideline 2014). Our animals still have a physiological skin, intestinal and mucosal flora. Parts of this normal flora and/or non-pathogenic commensals can be found during health monitoring. This is why there are positive results for e.g. *Streptococcus spp.*, *Staphylococcus spp.* etc. in our health monitoring reports.

During the health check for June 2022 and March 2023 by GVG-Diagnostics, PCR-positive evidence for the presence of *Helicobacter spp.* was found in some sentinel animals. Immediately a follow-up examination was initiated only on *Helicobacter* of the second sentinel animal or of faeces at the companies QM Diagnostics and mfd Diagnostics. These results of the follow-up tests did not reveal any FELASA relevant *Helicobacter* species.

If you have any questions please do not hesitate to contact us.

Dr. Stephan Sonntag
(Animal Facility Manager)

&

Dr. Maria Römel
(Veterinarian & Animal Welfare Officer)

Housing information

The LIMES – Genetic Resource Center (LIMES-GRC) is an animal facility of the Rheinische-Friedrich-Wilhelms University of Bonn located at the Life and Medical Sciences Institute (LIMES). It was established in 2012 and meets all standards of a modern animal facility.

The facility is designed for breeding and housing of mice. Highest priority of our daily work is to keep our animals healthy. Therefore, we have a very strict hygiene management that includes daily disinfection of all floors, sterilization/autoclave/H₂O₂ treatment of all materials and items entering mouse rooms as well as three different hygiene barriers. In all barriers masks, gloves, hair cover and dedicated clothing/shoes are worn.

Barrier yellow: The quarantine room. All living mice imported from other institutions are housed in this room. As animals from different institutions bring various microorganisms to our facility, barrier yellow is the most contaminated area. Access for scientists is restricted but possible under certain circumstances. There is no possibility for animals living in barrier yellow to enter one of the other barriers. To transfer a mouse line into the clean rooms in barrier red or green an embryo transfer is the only option. To avoid contamination of the rest of the facility all materials from the quarantine room are autoclaved before leaving the room.

Barrier red: The clean rooms. All mouse lines are brought into this area once by embryo transfer and breeding is maintained by mating. The mice are free of all relevant murine pathogens (see FELASA guideline 2014). To keep unwanted entry of microorganisms as low as possible barrier red is a high security shower-in barrier with access for dedicated staff only.

Barrier green: The experimental rooms. All mice housed in these rooms originate from the clean rooms in barrier red or are imported from commercial vendors. The mice are free of all important murine pathogens. The green barrier includes rooms for mouse housing as well as experimental rooms. Scientists have access to their animals and are able to perform experiments on them. Animals from barrier green are specifically prohibited to be placed back into the clean rooms in barrier red.

Mice are housed in individually ventilated cages (IVC, Tecniplast) at 21°C, 55% relative humidity and an air exchange rate of fiftyfold – seventyfold per hour. Day and night are simulated with 12 h white light and 12 h red light. Each cage is equipped with autoclaved food and autoclaved water *ad libitum* as well as autoclaved wooden bedding and nesting material.

Health status of our colony is monitored every three months. Two C57BL/6NCrI x BALB/cAnNCrI hybride females are kept on samples of dirty-bedding from up to 139 cages for a maximum of three months. Then one of the sentinel animals is tested for various murine pathogens (see FELASA guideline 2014) by a certified laboratory. The other animal is withheld in case additional analyses are necessary.

Three times a year, our sentinels are sent to GVG Diagnostics in Leipzig for a "small" FELASA examination. Once a year, our sentinels are sent to mfd Diagnostics in Wendelsheim for a "large" FELASA examination. These laboratories perform the virological examination of the samples by ELISA. The bacteriology is mainly done by cultures with the exception of *Helicobacter* spp. which is detected by PCR. In the large FELASA examination, *Clostridium piliforme* and *Mycoplasma pulmonis* are detected by ELISA. The parasitological examination is divided into macroscopic examinations for the detection of ectoparasites and microscopic examinations for the detection of endoparasites (flotation, smear preparation, direct smear). In addition, conspicuous pathological changes are documented during necropsy and further diagnosed if necessary.

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Health monitoring report - LIMES-GRC, University Bonn

Room SPF7	Test date Test lab	11. Mrz. 2024	4. Dez. 2023	18. Sep. 2023	12. Jun. 2023	13. Mrz 2023	6. Dez 2022	Historical results in the last 2 years
		GVG	mfd	GVG	GVG	GVG&QM&mfd	mfd	
		pos \ tested	pos \ tested	pos \ tested	pos \ tested	pos \ tested	pos \ tested	
FELASA relevant pathogens								
Viruses								
Ectromelia (mousepox) virus	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Lymphocytic choriomeningitis virus (LCMV)	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Minute virus of mice (MVM)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Mouse adenovirus type 1	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Mouse adenovirus type 2	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Mouse hepatitis virus (MHV)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Mouse parvovirus (MPV 1, MPV 2)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Mouse rotavirus (EDIM)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Murine norovirus (MNV)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Pneumonia virus of mice (PVM)	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Reovirus type 3 (Reo 3)	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Sendai virus	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Theiler's murine encephalomyelitis virus	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Bacteria								
Citrobacter rodentium	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Clostridium piliforme	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Corynebacterium kutscheri	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Helicobacter bilis	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Helicobacter hepaticus	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Helicobacter typhlonius	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Mycoplasma pulmonis	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Rodentibacter heylili	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Rodentibacter pneumotropicus	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Salmonella spp.	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Streptobacillus moniliformis	annually	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Streptococci beta-haemolytic (not group D)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Streptococcus pneumoniae	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Endoparasites								
Aspicularis tetraptera (Pinworm)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Chilomastix spp.	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Cryptosporidium	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Eimeria (Coccidia)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Encephalitozoon cuniculi	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Entamoeba spp.	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Giardia spp.	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Hexamastix muris	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Retortamonas sp.	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Rodentolepis nana (Tapeworm)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Spirochaeta muris	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Syphacia muris (Pinworm)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Syphacia obvelata (Pinworm)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Trichomonas spp.	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Ectoparasites								
Myobia musculus (Mites)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Myocoptes musculus (Mites)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Phthiraptera (Lice)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Radfordia spp. (Mites)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Siphonaptera (Fleas)	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 48
Pathology (Lesions)								
abnormalities fur	3 months	0 \ 6	0 \ 6	0 \ 6	1 \ 6	0 \ 6	0 \ 6	1 \ 24
abnormalities gastrointestinal tract	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
abnormalities liver	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
abnormalities lung	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
abnormalities lymph node	3 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
abnormalities spleen	6 months	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
abnormalities uterus	3 months	1 \ 6	0 \ 6	1 \ 6	0 \ 6	0 \ 6	0 \ 6	2 \ 24
Additional germs								
Viruses								
Hantavirus		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Herpesviruses (MCMV; thymus)		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Lactate-dehydrogenase elevating virus		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Polyomaviruses (polyoma; K)		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Bacteria								
Acinetobacter johnsonii		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 24
Aerococcus viridans		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Actinobacillus muris		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Cilia-associated respiratory bacillus		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Enterobacter spp.		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Enterococcus spp.		1 \ 6	3 \ 6	2 \ 6	0 \ 6	0 \ 6	0 \ 6	11 \ 48
Escherichia coli		1 \ 6	1 \ 6	1 \ 6	0 \ 6	4 \ 6	3 \ 6	15 \ 48
Haemophilus spp.		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Helicobacter spp.		0 \ 6	0 \ 6	0 \ 6	1 \ 6	0 \ 6	0 \ 6	1 \ 48
Klebsiella oxytoca		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Klebsiella pneumoniae		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Lactobacillus spp.		6 \ 6	6 \ 6	6 \ 6	6 \ 6	6 \ 6	6 \ 6	48 \ 48
Mannheimia haemolytica		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Niallia circulans		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Pasteurella multocida		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Pasteurella spp.		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Peribacillus muralis		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Peribacillus simplex		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Priestia megaterium		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Pseudomonas aeruginosa		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Pseudomonas luteola		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Staphylococcus aureus		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 12
Staphylococcus lentus		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6
Staphylococcus sciuri		0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 6	0 \ 36
Staphylococcus spp.		0 \ 6	5 \ 6	0 \ 6	0 \ 6	0 \ 6	3 \ 6	8 \ 12
Staphylococcus xylosum		5 \ 6	0 \ 6	6 \ 6	6 \ 6	6 \ 6	0 \ 6	33 \ 36
Streptococci alpha-haemolytic, green		6 \ 6	0 \ 6	6 \ 6	6 \ 6	6 \ 6	0 \ 6	36 \ 36
Streptococcus spp.		6 \ 6	0 \ 6	6 \ 6	6 \ 6	5 \ 6	0 \ 6	32 \ 36