Revised forms for the submission of the Confidence-Building Measures

At the Third Review Conference it was agreed that all States Parties present the following declaration, later amended by the Seventh Review Conference:

Declaration form on Nothing to Declare or Nothing New to Declare for use in the information exchange

Measure	*Nothing to declare*	*Nothing new to declare*	*Year of last declaration if nothing new to declare*
A, part 1			
A, part 2 (i)		X	2009
A, part 2 (ii)			
A, part 2 (iii)			
B			
C			
E			
F		X	2001
G			

(Please mark the appropriate box(es) for each measure with a tick, and fill in the year of last declaration in the last column where applicable.)

Date: Saturday, April 15, 2023

State Party to the Convention: Switzerland

Date of ratification/accession to the Convention: Tuesday, May 4, 1976

National point of contact:

Laurin van der Haegen (Arms Control, Disarmament and Cybersecurity Section - International Security Division - Swiss Federal Department of Foreign Affairs) - laurin.vanderhaegen@eda.admin.ch
Political Affairs Officer BWC/CWC

Address: Effingerstrasse 27 3003 Bern Switzerland

Telephone: +41 58 467 69 18

Active promotion of contacts

The Third Review Conference agreed that States parties continue to implement the following:

"Active promotion of contacts between scientists, other experts and facilities engaged in biological research directly related to the Convention, including exchanges and visits for joint research on a mutually agreed basis."

In order to actively promote professional contacts between scientists, joint research projects and other activities aimed at preventing or reducing the occurrence of ambiguities, doubts and suspicions and at improving international cooperation in the field of peaceful bacteriological (biological) activities, the Seventh Review Conference encouraged States parties to share forward looking information, to the extent possible,

- on planned international conferences, seminars, symposia and similar events dealing with biological research directly related to the Convention, and

- on other opportunities for exchange of scientists, joint research or other measures to promote contacts between scientists engaged in biological research directly related to the Convention,

including through the Implementation Support Unit (ISU) within the United Nations Office for Disarmament Affairs.

Confidence-Building Measure "A"

Part 1 Exchange of data on research centres and laboratories

At the Third Review Conference it was agreed that States Parties continue to implement the following:

"Exchange of data, including name, location, scope and general description of activities, on research centres and laboratories that meet very high national or international safety standards established for handling, for permitted purposes, biological materials that pose a high individual and community risk or specialize in permitted biological activities directly related to the Convention."

Modalities

The Third Review Conference agreed on the following, later amended by the Seventh Review Conference:

Data should be provided by States Parties on each facility, within their territory or under their jurisdiction or control anywhere, which has any maximum containment laboratories meeting those criteria for such maximum containment laboratories as specified in the latest edition of the WHO[1] Laboratory Biosafety Manual and/or OIE[2] Terrestrial Manual or other equivalent guidelines adopted by relevant international organisations, such as those designated as biosafety level 4 (BL4, BSL4 or P4) or equivalent standards.

States Parties that do not possess a facility meeting criteria for such maximum containment should continue to Form A, part 1 (ii).

Form A, part 1 (i)

Exchange of data on research centres and laboratories [3]

1. Name(s) of facility [4]:
Labor Spiez (Spiez Laboratory)

[Declared in accordance with Form A Part 2(iii)]

2. Responsible public or private organization or company:
Federal Office for Civil Protection, Federal Department of Defence, Civil Protection and Sports

3. Location and postal address:
Labor Spiez, Bundesamt für Bevölkerungsschutz, Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport, Austrasse, CH-3700 Spiez, Switzerland

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence:

Swiss Confederation (Federal Department of Defence, Civil Protection and Sports)

5. Number of maximum containment units [5] within the research centre and/or laboratory, with an indication of their respective size (SqM):

BL 2: 483 SqM
BL 3: 126 SqM
BL 4: 118 SqM
Of note, the BSL4 unit is operational and holds a license as follows: "Development of methods to detect and analyze viral pathogens of risk group 4 (clinical samples, environmental samples, including samples suspect of bioterrorism origin) as well as evaluation of antiviral substances, neutralizing antibodies and decontamination solutions".

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate:

Spiez Laboratory, which is part of the Federal Department for Civil Protection, is the Swiss Center of Expertise in NBC Protection. Its Biology Division has a range of activities including research, development, test & evaluation, training, as well as diagnosis in the fields of virology, bacteriology, toxinology and biosafety. The tasks include analysis of unknown samples, diagnostics of potential biological warfare and bioterror agents, and research & development in coordination with contractors. Spiez Laboratory deals with many different biological agents and toxins known to be pathogenic for humans.

Spiez Laboratory is also a National Reference Center mandated by the Swiss Federal Office of Public Health as follows:

- National Reference Center for Highly Pathogenic Bacteria
  - *Bacillus anthracis* (anthrax)
  - *Francisella tularensis* (tularemia)
  - *Yersinia pestis* (plague)
  - *Brucella spp.* (brucellosis)
  - *Burkholderia pseudomallei* (melioidosis)
  - other bacterial pathogens according to requirements of the national coordination committee of the Regional Laboratory Network

In addition, Spiez Laboratory supports the National Reference Center for Emerging Viral Infections responsible for the detection of emerging and reemerging viruses of all biosafety levels, especially hemorrhagic fever viruses and variola virus.

For more detailed information please visit: https://www.spiezlab.admin.ch/en/home.html

1. Name(s) of facility [4]:

Centre National de Référence pour les Infections Virales Emergentes (National Reference Center for Emerging Viral Infections)

[Declared in accordance with Form A Part 2(iii)]

2. Responsible public or private organization or company:

Virology Laboratory, University Hospitals of Geneva

3. Location and postal address:

Centre National de Référence pour les Infections Virales Emergentes, Laboratoire de Virologie, Hôpitaux Universitaires de Genève, Rue Gabrielle Perret-Gentil 4, CH-1205 Genève, Switzerland

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence:

Swiss Confederation (Federal Department of Home Affairs)

5. Number of maximum containment units [5] within the research centre and/or laboratory, with an indication of their respective size (SqM):

BL 2: 29 SqM
BL 3: 39 SqM
BL 4: 36 SqM
Of note, the BSL4 unit is operational and holds a license for diagnostic purposes only, as follows: "Detection of viruses in clinical samples by molecular and/or serological methods".

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate:

The National Reference Center for Emerging Viral Diseases (CRIVE/NAVI) is a national reference laboratory by order of the Federal Office of Public Health. Its task is the detection of emerging and re-emerging viruses of all biosafety levels, especially hemorrhagic fever viruses and smallpox virus. The BSL4 unit is approved for diagnostic purposes only, which does not allow any culturing or enrichment of such viruses. The National Reference Center for Emerging Viral Diseases is part of the Laboratory of Virology at the University Hospitals of Geneva. Since the 1st January 2018, the CRIVE acts also as WHO National Center for Measles and Rubella.

The Laboratory of Virology (LV) performs the analysis of many viruses impacting the human health as done in most of the hospitals (HIV, Hepatitis, CMV, EBV, respiratory and enteric viruses, etc.). LV does most of the viral analysis needed by an university hospital.

LV also hosts the Swiss National Center for Influenza.

For further information please visit (website in French): https://www.hug-ge.ch/laboratoire-virologie

1. Name(s) of facility [4]:
Institut für Medizinische Virologie (Institute of Medical Virology)

[Declared in accordance with Form A Part 2(iii)]

2. Responsible public or private organization or company:
Faculty of Medicine, University of Zurich

3. Location and postal address:
Institut für Medizinische Virologie, Medizinische Fakultät, Universität Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence:

Cantons of Appenzell Ausserrhoden, Appenzell Innerrhoden, Glarus, Graubünden, Sankt Gallen, Schaffhausen, Thurgau, Zug, Zürich, and the Principality of Liechtenstein

5. Number of maximum containment units [5] within the research centre and/or laboratory, with an indication of their respective size (SqM):

BL 3: 25 SqM
Of note, the Institute of Medical Virology holds a BSL4 license for diagnostic purposes only, as follows: "Inactivation or extraction of environmental samples or samples with potentially highly pathogenic viruses for diagnostic purposes".

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate:

The Institute of Medical Virology at the University of Zurich is the Regional Competence Center for the primary analysis of viral samples suspicious of a bioterror-related background. This represents an additional and not a continuous task of the viral diagnostics laboratory.

For further information please visit:
https://www.virology.uzh.ch/en.html

1. Name(s) of facility [4]:
Institut für Virologie und Immunologie (Institute of Virology and Immunology)

[Declared in accordance with Form A Part 2(iii)]

2. Responsible public or private organization or company:

Federal Food Safety and Veterinary Office, Federal Department of Home Affairs

3. Location and postal address:

Institut für Virologie und Immunologie, Bundesamt für Lebensmittelsicherheit und Veterinärwesen, Eidgenössisches Departement des Innern, Sensemattstrasse 293, CH-3147 Mittelhäusern, Switzerland

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence:

Swiss Confederation (Federal Department of Home Affairs)

5. Number of maximum containment units [5] within the research centre and/or laboratory, with an indication of their respective size (SqM):

BL 2: 600 SqM
BL 3: 100 SqM
ABL 3 Ag: 10000 SqM
Of note, ABL3Ag facilities have special features not comparable to standard BSL3 or BSL4 facilities. The shell is considered BSL4, whereas inside the containment area BSL1, BSL2 and BSL3 space is common standard. Personnel enters through a shower barrier and is provided with suitable laboratory clothing for BSL1, 2 and 3 inside the containment area. Personnel has to shower out when leaving the containment area and has to keep a 72h quarantine (no contact to cloven hoofed animals). The IVI fulfills the requirements of the EU Minimum Biorisk Management Standards for Laboratories Working with Foot-And-Mouth Disease Virus. Due to these special features of ABL3Ag facilities, the ABL3Ag area is not limited to laboratory units only, but also includes engineering floors such as effluent treatment plant or ventilation units and animal units, which are all located within the containment area. Therefore, all maintenance work has to be done during operation – the facility has never been shut down so far. This also means that a direct comparison with BSL4 facilities is not practicable. Licenses are as follows: "Study of African swine fever immunopathogenesis in domestic pigs"; "Quality controls of immuno-biological products for use in applications of veterinary medicine"; "Establishment of a cell-based rapid test to determine protection provided by vaccination against foot-and-mouth disease virus"; "Peste des petits ruminants virulence".

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate:

The Institute of Virology and Immunology (IVI), which is part of the Swiss Federal Food Safety and Veterinary Office, is the ISO 17025 accredited institute for the diagnosis, surveillance and control of highly contagious epizootics. As such the IVI is the national reference laboratory for >25 pathogens. In addition, the IVI pursues research both on these viruses and emerging viral diseases, as well as their potential transmission to man. The IVI is also the competent authority issuing the licenses required for the sale of veterinary immunobiological products. Basic research is carried out in the fields of immunology and virology, and involves influenza virus, foot-and-mouth disease virus, African swine fever virus and new emergent viruses with zoonotic potential. An important research topic in 2022 was SARS-CoV-2. The development and diagnostics branches focus on assays and tests for various viral animal diseases. Through the cooperation with the Vetsuisse Faculty of the University of Bern, the IVI is also responsible for the teaching of virology and immunology.

For further information please visit: https://www.ivi.admin.ch/ivi/en/home.html

Form A, part 1 (ii)

If no BSL4 facility is declared in Form A, part 1 (i), indicate the highest biosafety level implemented in facilities handling biological agents[6] on a State Party's territory:

Biosafety level 3[7]	N/A
Biosafety level 2[8] (if applicable)	N/A

Any additional relevant information as appropriate:

N/A

Part 2 Exchange of information on national biological defence research and development programmes

At the Third Review Conference it was agreed that States Parties are to implement the following:

In the interest of increasing the transparency of national research and development programmes on biological defence, the States Parties will declare whether or not they conduct such programmes. States Parties agreed to provide, annually, detailed information on their biological defence research and development programmes including summaries of the objectives and costs of effort performed by contractors and in other facilities. If no biological defence research and development programme is being conducted, a null report will be provided.

States Parties will make declarations in accordance with the attached forms, which require the following information:

(1) The objective and summary of the research and development activities under way indicating whether work is conducted in the following areas: prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination and other related research;

(2) Whether contractor or other non-defence facilities are utilized and the total funding provided to that portion of the programme;

(3) The organizational structure of the programme and its reporting relationships; and

(4) The following information concerning the defence and other governmental facilities in which the biological defence research and development programme is concentrated;

(a) location;

(b) the floor areas (sqM) of the facilities including that dedicated to each of BL2, BL3 and BL4 level laboratories;

(c) the total number of staff employed, including those contracted full time for more than six months;

(d) numbers of staff reported in (c) by the following categories: civilian, military, scientists, technicians, engineers, support and administrative staff;

(e) a list of the scientific disciplines of the scientific/engineering staff;

(f) the source and funding levels in the following three areas: research, development, and test and evaluation; and

(g) the policy regarding publication and a list of publicly-available papers and reports.

Form A, part 2 (i)

National biological defence research and development programmes Declaration

Are there any national programmes to conduct biological defence research and development within the territory of the State Party, under its jurisdiction or control anywhere? Activities of such programmes would include prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination and other related research.

yes

If the answer is Yes, complete Form A, part 2 (ii) which will provide a description of each programme.

Form A, part 2 (ii)

National biological defence research and development programmes

Description

National Biological Defense Program

1. State the objectives and funding of each programme and summarize the principal research and development activities conducted in the programme. Areas to be addressed shall include: prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination and other related research.

The objective is to establish national biological defense proficiency by developing and improving precise and accurate tests for the rapid diagnosis as well as for identification and characterzation, of different biological agents and toxins using various methods. Spiez Laboratory is assigned to fulfill this task and to close any gaps to reach national biological defense excellence. To improve the national biological defense capabilities of Switzerland, Spiez Laboratory has funds available to run a dedicated program with the goal of added research and development mainly benefitting detection, diagnostic and identification techniques. Part of the program is conducted under contract with national and international industries, academic institutions as well as domestic and foreign governmental agencies, as detailed in paragraph 5.

Spiez Laboratory is part of the Federal Office for Civil Protection FOCP within the Federal Department of Defence, Civil Protection and Sports DDPS of the Swiss Confederation. Spiez Laboratory is the Swiss center of expertise in protection against nuclear, biological and chemical (NBC) threats and hazards. Besides delivering its expertise to relevant stakeholders, the Biology Division of Spiez Laboratory is concerned with the identification of biological agents and toxins, as well as supports military biological protection units. The Biology Division has expertise in the fields of virology, bacteriology and toxinology, as well as biosafety and biosecurity.

Spiez Laboratory possesses a high containment facility that allows for the safe handling of biological agents of all risk groups. It is the only BSL4 high containment facility in Switzerland holding a license which is not limited to diagnostic purposes. It serves towards the comprehensive detection and identification of human pathogens. This enables Spiez Laboratory to act in the Regional Laboratory Network as both a Regional Competence Center and as a National Reference Center / National Reference Laboratory having all necessary capabilities and capacities at hand.

For additional information and more on the vision of a world without weapons of mass destruction please visit: https://www.spiezlab.admin.ch/en/home.html

2. State the total funding for each programme and its source.

Swiss Confederation, Federal Department of Defence, Civil Protection and Sports DDPS, Federal Office for Civil Protection FOCP.

Total Funding: 5'000'000 p.a.

Funding Currency: CHF

3. Are aspects of these programmes conducted under contract with industry, academic institutions, or in other non-defence facilities?

yes

4. If yes, what proportion of the total funds for each programme is expended in these contracted or other facilities?

10 %

5. Summarize the objectives and research areas of each programme performed by contractors and in other facilities with the funds identified under paragraph 4.

All contracted research and development of the program is supervised by Spiez Laboratory. Please also refer to paragraph 1 above for additional details. The contractors part of the program in 2022 were as follows:

- Eidgenössische Technische Hochschule Zürich – ETHZ
  Functional Genomics Center Zurich – FGCZ
  Winterthurerstrasse 190
  CH-8057 Zürich
  Switzerland
  Project title: „Next Generation Sequencing“

- Eidgenössische Technische Hochschule Zürich – ETHZ
  Center for Security Studies – CSS
  Haldeneggsteig 4, IFW
  CH-8092 Zürich
  Switzerland
  Project title: „Analysis of trends in science and policy“

- Robert Koch-Institut – RKI
  Zentrum für Biologische Toxine – ZBS3
  Nordufer 20
  DE-13353 Berlin
  Germany
  Project title: „Staphylococcus aureus enterotoxin detection in foods“

- Scuola Universitaria Professionale della Svizzera Italiana – SUPSI
  Istituto Microbiologia
  Via Mirasole 22a
  CH-6500 Bellinzona
  Switzerland
  Project title: „Vector Surveillance”
  Project title: „Next-Generation Toxin Detection“
  Project title: „Establishment of a CRISPR-Cas System for agile diagnostics and antiviral testing”

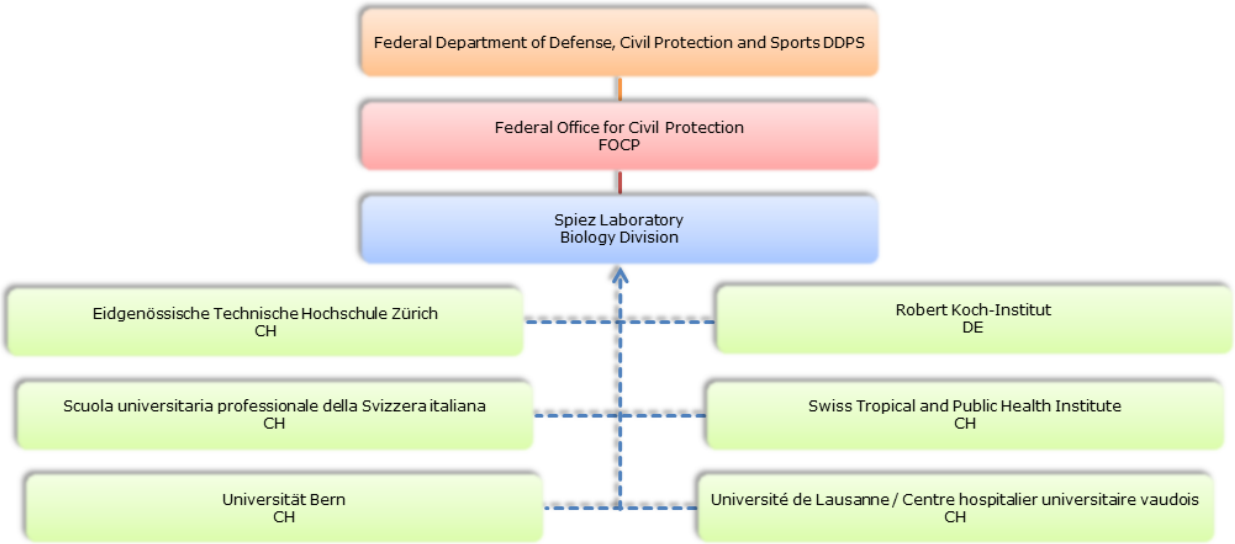
- Swiss Tropical and Public Health Institute – SwissTPH
  Socinstrasse 57
  CH-4051 Basel
  Switzerland
  Project title: „Next Generation Sequencing”

- Universität Bern – UniBE
  Interfaculty Bioinformatics Unit – IBU
  Baltzerstrasse 6
  CH-3012 Bern
  Switzerland
  Project title: „Functional Characterisation of *Francisella tularensis holarctica* with a proteogenomic approach“

- Université de Lausanne / Centre Hospitalier Universitaire Vaudois – Unil / CHUV
  Institut de microbiologie – IMUL
  Rue du Bugnon 48
  CH-1011 Lausanne
  Switzerland
  Project title: „Assessment of tenacity of highly pathogenic viruses, antivirals and inactivation strategies as well as evaluation of clinical samples”

- Universität Bern – UniBE
  Department for Biomedical Research
  Sahli-Haus 2
  CH-3010 Bern
  Switzerland
  Project title: „Assessment of tenacity of highly pathogenic viruses, antivirals and inactivation strategies as well as evaluation of clinical samples”

6. Provide a diagram of the organizaional structure of each programme and the reporting relationships (include individual facilities participating in the programme).



7. Provide a declaration in accordance with Form A, part 2 (iii) for each facility, both governmental and non-governmental, which has a substantial proportion of its resources devoted to each national biological defence research and development programme, within the territory of the reporting State, or under its jurisdiction or control anywhere.

Please refer to Form A, part 2 (iii).

Attachments:
N/A

Regional Laboratory Network

1. State the objectives and funding of each programme and summarize the principal research and development activities conducted in the programme. Areas to be addressed shall include: prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination and other related research.

The objective is the establishment and maintenance of capability and capacity for the rapid laboratory-based identification of pathogens in case of a biological emergency, whether it be of natural or accidental origin or due to deliberate release. This forms the basis for any adequate countermeasures that need to be planned and implemented to ensure the protection of the population. The consequent integration of state of the art detection and diagnostic techniques as well as their constant refinement and improvement is therefore indispensable for a holistic biological emergency concept.

The implemented structure is a decentralized network of Regional Competence Centers and National Reference Centers, all of which have been mandated by the Federal Office of Public Health. This network benefits from already existing infrastructure. The network is embedded in the Swiss CBRN concept and is coordinated by the Regional Laboratory Coordination Committee that consists of federal, cantonal and scientific experts. There is a total of three National Reference Centers and six Regional Competence Centers called Regional Laboratories. The task for Regional Laboratories is the rapid identification of pathogens, whereas National Reference Centers are qualified for confirmatory analysis. All facilities pursue civil duties and are put on assignments of the Regional Laboratory Network in the event of biological emergencies only. All cantons are part of the network either as a host canton of a Regional Laboratory (bold) or as an affiliated canton:

Regional Laboratory West: FR, **GE**, NE, **VD**, VS
Regional Laboratory West Central: **BE**, JU
Regional Laboratory East Central: **LU**, NW, OW, SZ, UR
Regional Laboratory East: AI, AR, GL, GR, SG, SH, TG, ZG, **ZH** (+ FL)
Regional Laboratory North: AG, BL, **BS**, SO
Regional Laboratory South: **TI**

Of note, the two cantons of Genève (GE) and Vaud (VD) share the authority over the Regional Laboratory West. The Principality of Liechtenstein (FL) participates in the Regional Laboratory East. For an explanation of abbreviations, please refer to the comprehensive map presented in paragraph 6.

The network consists of the following facilities that are described in Form A, part 2 (iii) in more detail:

Function	**Authority**	**Facility**
NRC	GDK	Labor Spiez
		Centre National de Référence pour les Infections Virales Emergentes
		Institut für Virologie und Immunologie
RL West	Canton of Genève	Laboratoire de Bactériologie
		Centre National de Référence pour les Infections Virales Emergentes
	Canton of Vaud	Laboratoires de Diagnostic de l'Institut de Microbiologie
RL West Central	Canton of Bern	Labor Spiez
RL East Central	Canton of Luzern	Medizinische Mikrobiologie, Luzerner Kantonsspital
RL East	Canton of Zürich	Institut für Medizinische Mikrobiologie
		Institut für Medizinische Virologie
RL North	Canton of Basel-Stadt	Kantonales Laboratorium Basel-Stadt
RL South	Canton of Ticino	Istituto Microbiologia

Abbreviations:
NRC: National Reference Center
RL: Regional Laboratory
GDK: Swiss Conference of Cantonal Ministers of Public Health

Information on the Regional Laboratory Network can also be found online (website in French):
https://www.bag.admin.ch/bag/fr/home/krankheiten/infektionskrankheiten-bekaempfen/labordiagnostik-infektionskrankheiten/regionallabornetzwerk.html

2. State the total funding for each programme and its source.

All personnel involved in activities in relation to the Regional Laboratory Network is tasked with other civil duties. Many of these other activities, such as development of related methods, sample preparation and processing, training, etc., although at least indirectly of benefit to the activities in relation to the Regional Laboratory Network, remain unaccounted for and are not singled out as being of such nature. Furthermore, the whole network relies on existing infrastructures in use for other civil purposes. Due to these facts it is not possible to sort out personnel costs, cost of materials and consumables, as well as dedicated infrastructure costs for the program, however, it is possible to name the funding sources as follows:

- Swiss Confederation, Federal Department of Home Affairs FDHA
- All twenty-six cantons of Switzerland
- Principality of Liechtenstein

Total Funding: N/A

Funding Currency: N/A

3. Are aspects of these programmes conducted under contract with industry, academic institutions, or in other non-defence facilities?

no

4. If yes, what proportion of the total funds for each programme is expended in these contracted or other facilities?

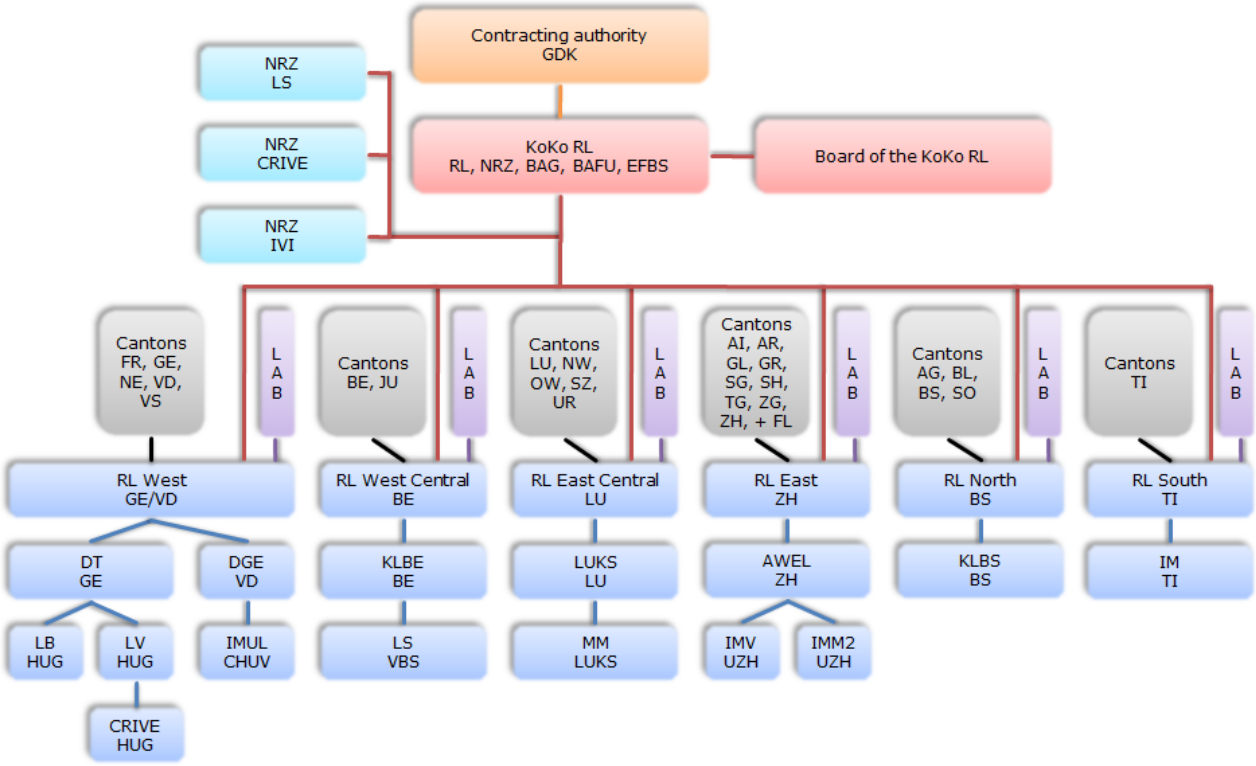
N/A

5. Summarize the objectives and research areas of each programme performed by contractors and in other facilities with the funds identified under paragraph 4.

N/A

6. Provide a diagram of the organizaional structure of each programme and the reporting relationships (include individual facilities participating in the programme).

SWITZERLAND
AG Aargau
AI Appenzell Innerrhoden
AR Appenzell Ausserrhoden
BE Bern / Berne
BL Basel Landschaft
BS Basel Stadt
FR Fribourg / Freiburg
GE Genève
GL Glarus
GR Graubünden / Grischun / Grigioni
JU Jura
LU Luzern
NE Neuchâtel
NW Nidwalden
OW Obwalden
SG Sankt Gallen
SH Schaffhausen
SO Solothurn
SZ Schwyz
TG Thurgau
TI Ticino
UR Uri
VD Vaud
VS Valais / Wallis
ZG Zug
ZH Zürich



AWEL:	Office for Waste, Water, Energy and Air
BAFU:	Federal Office for the Environment
BAG:	Federal Office of Public Health
Cantons:	Please refer to the map in paragraph 1 above
CHUV:	University Hospital Center of Vaud
CRIVE:	National Reference Center for Emerging Viral Infections
DT:	Department for the Territory
DGE:	Directorate-General for Environment
EFBS:	Swiss Expert Committee for Biosafety
GDK:	Swiss Conference of Cantonal Ministers of Public Health
HUG:	University Hospitals of Geneva
IMM:	Institute of Medical Microbiology
IMUL:	Diagnostic Laboratories of the Institute of Microbiology
IMV:	Institute of Medical Virology
IM:	Institute of Microbiology
IVI:	Institute of Virology and Immunology
KLBE:	Cantonal Laboratory of Berne
KLBS:	Cantonal Laboratory of Basel-Stadt
KoKo:	Coordination Committee
LAB:	Laboratory Advisory Board
LB:	Bacteriological Laboratory
LS:	Spiez Laboratory
LUKS:	Cantonal Hospital of Luzern
LV:	Virological Laboratory
MM:	Medical Microbiology
NRZ:	National Reference Center
RL:	Regional Laboratory
UZH:	University of Zurich
VBS:	Federal Department of Defense, Civil Protection and Sports

7. Provide a declaration in accordance with Form A, part 2 (iii) for each facility, both governmental and non-governmental, which has a substantial proportion of its resources devoted to each national biological defence research and development programme, within the territory of the reporting State, or under its jurisdiction or control anywhere.

Please refer to Form A, part 2 (iii).

Attachments:
N/A

Form A, part 2 (iii)

National biological defence research and development programmes

Facilities

Complete a form for each facility declared in accordance with paragraph 7 in Form A, part 2 (ii).

In shared facilities, provide the following information for the biological defence research and development portion only.

1. What is the name of the facility?

Labor Spiez (Spiez Laboratory)

2. Where is it located (include both address and geographical location)?

Labor Spiez, Bundesamt für Bevölkerungsschutz, Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport, Austrasse, CH-3700 Spiez, Switzerland

N 46° 41' 26.32", E 7° 38' 39.41"

3. Floor area of laboratory areas by containment level:

BL 2: 483 SqM
BL 3: 126 SqM
BL 4: 118 SqM
Of note, the BSL4 unit is operational and holds a license as follows: "Development of methods to detect and analyze viral pathogens of risk group 4 (clinical samples, environmental samples, including samples suspect of bioterrorism origin) as well as evaluation of antiviral substances, neutralizing antibodies and decontamination solutions".

Total laboratory floor area (SqM):

727

4. The organizational structure of each facility.

(i) Total number of personnel: 21

(ii) Division of personnel:
Military: 0
Civilian: 21

(iii) Division of personnel by category:
Scientists: 14
Engineers: 0
Technicians: 7
Administrative and support staff: see below (iv)

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Virology, bacteriology, toxinology, biosafety and biosecurity.

Of note, as of 1 January 2023 the total number of personnel at Spiez Laboratory amounts to 103, of which 19 in the Biology Division and 2 in the NBC Arms Control Staff Unit dealing with biological matters. Spiez Laboratory also employs a number of administrative and support personnel that cannot be attributed to a single division.

(v) Are contractor staff working in the facility? If so, provide an approximate number.

5

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Swiss Confederation (Federal Department of Defence, Civil Protection and Sports):

CHF 5'000'000.-

Research	15 %
Development	10 %
Test & Evaluation	5 %
Analysis / Diagnosis	15 %
Education & Training	5 %
Other activities	50 % (costs for operation, maintenance and amortization)

(vii) What are the funding levels for the following programme areas:

Research: 15 %
Development: 10 %
Test and evaluation: 5 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

1. Direct antimicrobial resistance prediction from clinical MALDI-TOF mass spectra using machine learning.
Weis C, Cuénod A, Rieck B, Dubuis O, Graf S, Lang C, Oberle M, Brackmann M, Søgaard KK, Osthoff M, Borgwardt K, Egli A.
Nat Med. 2022 Jan;28(1):164-174. doi: 10.1038/s41591-021-01619-9. Epub 2022 Jan 10.

2. A teachable moment for dual-use.
Urbina F, Lentzos F, Invernizzi C, Ekins S.
Nat Mach Intell. 2022 Jul;4(7):607. doi: 10.1038/s42256-022-00511-6. Epub 2022 Jul 12.

3. AI in drug discovery: A wake-up call.
Urbina F, Lentzos F, Invernizzi C, Ekins S.
Drug Discov Today. 2023 Jan;28(1):103410. doi: 10.1016/j.drudis.2022.103410. Epub 2022 Oct 18.

4. Diagnostic challenges within the *Bacillus cereus*-group: finding the beast without teeth.
Muigg V, Cuénod A, Purushothaman S, Siegemund M, Wittwer M, Pflüger V, Schmidt KM, Weisser M, Ritz N, Widmer A, Goldenberger D, Hinic V, Roloff T, Søgaard KK, Egli A, Seth-Smith HMB.
New Microbes New Infect. 2022 Oct 26;49-50:101040. doi: 10.1016/j.nmni.2022.101040. eCollection 2022 Nov-Dec.

5. Dual Use of Artificial Intelligence-powered Drug Discovery.
Urbina F, Lentzos F, Invernizzi C, Ekins S.
Nat Mach Intell. 2022 Mar;4(3):189-191. doi: 10.1038/s42256-022-00465-9. Epub 2022 Mar 7.

6. Assessing emerging technologies from an arms control perspective.
Brackmann M, Gemünden M, Invernizzi C, Mogl S.
Front Res Metr Anal. 2022 Sep 12;7:1012355. doi: 10.3389/frma.2022.1012355. eCollection 2022.

7. The trispecific DARPin ensovibep inhibits diverse SARS-CoV-2 variants.
Rothenberger S, Hurdiss DL, Walser M, Malvezzi F, Mayor J, Ryter S, Moreno H, Liechti N, Bosshart A, Iss C, Calabro V, Cornelius A, Hospodarsch T, Neculcea A, Looser T, Schlegel A, Fontaine S, Villemagne D, Paladino M, Schiegg D, Mangold S, Reichen C, Radom F, Kaufmann Y, Schaible D, Schlegel I, Zitt C, Sigrist G, Straumann M, Wolter J, Comby M, Sacarcelik F, Drulyte I, Lyoo H, Wang C, Li W, Du W, Binz HK, Herrup R, Lusvarghi S, Neerukonda SN, Vassell R, Wang W, Adler JM, Eschke K, Nascimento M, Abdelgawad A, Gruber AD, Bushe J, Kershaw O, Knutson CG, Balavenkatraman KK, Ramanathan K, Wyler E, Teixeira Alves LG, Lewis S, Watson R, Haeuptle MA, Zürcher A, Dawson KM, Steiner D, Weiss CD, Amstutz P, van Kuppeveld FJM, Stumpp MT, Bosch BJ, Engler O, Trimpert J.
Nat Biotechnol. 2022 Dec;40(12):1845-1854. doi: 10.1038/s41587-022-01382-3. Epub 2022 Jul 21.

8. Preventing AI From Creating Biochemical Threats.
Urbina F, Lentzos F, Invernizzi C, Ekins S.
J Chem Inf Model. 2023 Feb 13;63(3):691-694. doi: 10.1021/acs.jcim.2c01616. Epub 2023 Jan 25.

9. Pediatric Tularemia-A Case Series From a Single Center in Switzerland.
Schöbi N, Agyeman PKA, Duppenthaler A, Bartenstein A, Keller PM, Suter-Riniker F, Schmidt KM, Kopp MV, Aebi C.
Open Forum Infect Dis. 2022 Jun 11;9(7):ofac292. doi: 10.1093/ofid/ofac292. eCollection 2022 Jul.

10. Serological testing for SARS-CoV-2 antibodies in clinical practice: A comparative diagnostic accuracy study.
Horn MP, Jonsdottir HR, Brigger D, Damonti L, Suter-Riniker F, Endrich O, Froehlich TK, Fiedler M, Largiadèr CR, Marschall J, Weber B, Eggel A, Nagler M.
Allergy. 2022 Jul;77(7):2090-2103. doi: 10.1111/all.15206. Epub 2022 Jan 11.

11. Exposure to avian coronavirus vaccines is associated with increased levels of SARS-CoV-2-cross-reactive antibodies.
Ardicli O, Carli KT, Satitsuksanoa P, Dreher A, Cusini A, Hutter S, Mirer D, Rückert B, Jonsdottir HR, Weber B, Cervia C, Akdis M, Boyman O, Eggel A, Brüggen MC, Akdis CA, van de Veen W.
Allergy. 2022 Dec;77(12):3648-3662. doi: 10.1111/all.15441. Epub 2022 Jul 23.

12. Molnupiravir combined with different repurposed drugs further inhibits SARS-CoV-2 infection in human nasal epithelium in vitro.
Jonsdottir HR, Siegrist D, Julien T, Padey B, Bouveret M, Terrier O, Pizzorno A, Huang S, Samby K, Wells TNC, Boda B, Rosa-Calatrava M, Engler OB, Constant S.
Biomed Pharmacother. 2022 Jun;150:113058. doi: 10.1016/j.biopha.2022.113058. Epub 2022 May 2.

13. Influence of Chlorinating Agents on the Formation of Stable Biomarkers in Hair for the Retrospective Verification of Exposure.
Martz SV, Wittwer M, Tan-Lin CW, Bochet CG, Brackmann M, Curty C.

Anal Chem. 2022 Dec 6;94(48):16579-16586. doi: 10.1021/acs.analchem.2c01867. Epub 2022 Nov 22.

Sex-specific differences in immune response to SARS-CoV-2 vaccination vanish with age.

14. Brigger D, Guntern P, Jonsdottir HR, Pennington LF, Weber B, Taddeo A, Zimmer G, Leborgne NGF, Benarafa C, Jardetzky TS, Eggel A.
Allergy. 2023 Jan 20. doi: 10.1111/all.15652. Online ahead of print.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

Spiez Laboratory, which is part of the Federal Department for Civil Protection, is the Swiss Center of Expertise in NBC Protection. Its Biology Division has a range of activities including research, development, test & evaluation, training, as well as diagnosis in the fields of virology, bacteriology, toxinology and biosafety. The tasks include analysis of unknown samples, diagnostics of potential biological warfare and bioterror agents, and research & development in coordination with contractors. Spiez Laboratory deals with many different biological agents and toxins known to be pathogenic for humans.

Spiez Laboratory is also a National Reference Center mandated by the Swiss Federal Office of Public Health as follows:

- National Reference Center for Highly Pathogenic Bacteria
  - *Bacillus anthracis* (anthrax)
  - *Francisella tularensis* (tularemia)
  - *Yersinia pestis* (plague)
  - *Brucella spp.* (brucellosis)
  - *Burkholderia pseudomallei* (melioidosis)
  - other bacterial pathogens according to requirements of the national coordination committee of the Regional Laboratory Network

In addition, Spiez Laboratory supports the National Reference Center for Emerging Viral Infections responsible for the detection of emerging and reemerging viruses of all biosafety levels, especially hemorrhagic fever viruses and variola virus.

For more detailed information please visit: https://www.spiezlab.admin.ch/en/home.html

1. What is the name of the facility?
Centre National de Référence pour les Infections Virales Emergentes (National Reference Center for Emerging Viral Infections)

2. Where is it located (include both address and geographical location)?
Centre National de Référence pour les Infections Virales Emergentes, Laboratoire de Virologie, Hôpitaux Universitaires de Genève, Rue Gabrielle Perret-Gentil 4, CH-1205 Genève, Switzerland

N 46° 11' 37.20", E 6° 8' 59.92"

3. Floor area of laboratory areas by containment level:
BL 2: 29 SqM

BL 3: 39 SqM
BL 4: 36 SqM
Of note, the BSL4 unit is operational and holds a license for diagnostic purposes only, as follows: "Detection of viruses in clinical samples by molecular and/or serological methods".

Total laboratory floor area (SqM):
104

4. The organizational structure of each facility.

(i) Total number of personnel: 6

(ii) Division of personnel:
Military: 0
Civilian: 6

(iii) Division of personnel by category:
Scientists: 4
Engineers: 0
Technicians: 2
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Medicine, biology, microbiology, molecular biology, viral genetics, infectious diseases.

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Swiss Confederation (Federal Department of Home Affairs).

Research	2 %
Development	55 %
Test & Evaluation	15 %
Analysis / Diagnosis	20 %
Education & Training	1 %
Other activities	7 % (costs for maintenance and administration)

(vii) What are the funding levels for the following programme areas:

Research: 2 %
Development: 55 %
Test and evaluation: 15 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

Infectious viral load in unvaccinated and vaccinated individuals infected with ancestral, Delta or Omicron SARS-CoV-2.

1. Puhach O, Adea K, Hulo N, Sattonnet P, Genecand C, Iten A, Jacquérioz F, Kaiser L, Vetter P, Eckerle I, Meyer B.

Nat Med. 2022 Jul;28(7):1491-1500. doi: 10.1038/s41591-022-01816-0. Epub 2022 Apr 8.

SARS-CoV-2 viral load and shedding kinetics.

2. Puhach O, Meyer B, Eckerle I.

Nat Rev Microbiol. 2023 Mar;21(3):147-161. doi: 10.1038/s41579-022-00822-w. Epub 2022 Dec 2.

Enhanced fitness of SARS-CoV-2 variant of concern Alpha but not Beta.

3. Ulrich L, Halwe NJ, Taddeo A, Ebert N, Schön J, Devisme C, Trüeb BS, Hoffmann B, Wider M, Fan X, Bekliz M, Essaidi-Laziosi M, Schmidt ML, Niemeyer D, Corman VM, Kraft A, Godel A, Laloli L, Kelly JN, Calderon BM, Breithaupt A, Wylezich C, Berenguer Veiga I, Gultom M, Osman S, Zhou B, Adea K, Meyer B, Eberhardt CS, Thomann L, Gsell M, Labroussaa F, Jores J, Summerfield A, Drosten C, Eckerle IA, Wentworth DE, Dijkman R, Hoffmann D, Thiel V, Beer M, Benarafa C.

Nature. 2022 Feb;602(7896):307-313. doi: 10.1038/s41586-021-04342-0. Epub 2021 Dec 22.

Pandemic origins and a One Health approach to preparedness and prevention: Solutions based on SARS-CoV-2 and other RNA viruses.

4. Keusch GT, Amuasi JH, Anderson DE, Daszak P, Eckerle I, Field H, Koopmans M, Lam SK, Das Neves CG, Peiris M, Perlman S, Wacharapluesadee S, Yadana S, Saif L.

Proc Natl Acad Sci U S A. 2022 Oct 18;119(42):e2202871119. doi: 10.1073/pnas.2202871119. Epub 2022 Oct 10.

Different virus, same mistakes: Why (re-) emerging viruses are one step ahead of us.

5. Vetter P, Jacquérioz F, Eckerle I.

Innovation (Camb). 2022 Jun 23;3(4):100273. doi: 10.1016/j.xinn.2022.100273. eCollection 2022 Jul 12.

SARS-CoV-2 antigen-detecting rapid tests for the delta variant.

6. Bekliz M, Adea K, Essaidi-Laziosi M, Sacks JA, Escadafal C, Kaiser L, Eckerle I.

Lancet Microbe. 2022 Feb;3(2):e90. doi: 10.1016/S2666-5247(21)00302-5. Epub 2021 Nov 24.

Feasibility of home-based ELISA capillary blood self-testing for anti-SARS-CoV-2 antibodies.

7. Baggio S, Togni G, Eckerle I, Vuillemier N, Kaiser L, Gétaz L.

Pract Lab Med. 2022 Aug;31:e00290. doi: 10.1016/j.plabm.2022.e00290. Epub 2022 Jul 12.

A SARS-CoV-2 omicron (B.1.1.529) variant outbreak in a primary school in Geneva, Switzerland.

8. Lorthe E, Bellon M, Berthelot J, Michielin G, L'Huillier AG, Posfay-Barbe KM, Azman AS, Guessous I, Maerkl SJ, Eckerle I, Stringhini S; SEROCoV-Schools Study Group.

Lancet Infect Dis. 2022 Jun;22(6):767-768. doi: 10.1016/S1473-3099(22)00267-5. Epub 2022 Apr 14.

Analytical Sensitivity of Eight Different SARS-CoV-2 Antigen-Detecting Rapid Tests for Omicron-BA.1 Variant.

9. Bekliz M, Adea K, Puhach O, Perez-Rodriguez F, Marques Melancia S, Baggio S, Corvaglia AR, Jacquerioz F, Alvarez C, Essaidi-Laziosi M, Escadafal C, Kaiser L, Eckerle I.

Microbiol Spectr. 2022 Aug 31;10(4):e0085322. doi: 10.1128/spectrum.00853-22. Epub 2022 Aug 8.

Neutralization capacity of antibodies elicited through homologous or heterologous infection or vaccination against SARS-CoV-2 VOCs.

10. Bekliz M, Adea K, Vetter P, Eberhardt CS, Hosszu-Fellous K, Vu DL, Puhach O, Essaidi-Laziosi M, Waldvogel-Abramowski S, Stephan C, L'Huillier AG, Siegrist CA, Didierlaurent AM, Kaiser L, Meyer B, Eckerle I.

Nat Commun. 2022 Jul 4;13(1):3840. doi: 10.1038/s41467-022-31556-1.

Sequential infections with rhinovirus and influenza modulate the replicative capacity of SARS-CoV-2 in the upper respiratory tract.

11. Essaidi-Laziosi M, Alvarez C, Puhach O, Sattonnet-Roche P, Torriani G, Tapparel C, Kaiser L, Eckerle I.

Emerg Microbes Infect. 2022 Dec;11(1):412-423. doi: 10.1080/22221751.2021.2021806.

Seroprevalence of anti-SARS-CoV-2 IgG antibodies, risk factors for infection and associated symptoms in Geneva, Switzerland: a population-based study.

12. Richard A, Wisniak A, Perez-Saez J, Garrison-Desany H, Petrovic D, Piumatti G, Baysson H, Picazio A, Pennacchio F, De Ridder D, Chappuis F, Vuilleumier N, Low N, Hurst S, Eckerle I, Flahault A, Kaiser L, Azman AS, Guessous I, Stringhini S.

Scand J Public Health. 2022 Feb;50(1):124-135. doi: 10.1177/14034948211048050. Epub 2021 Oct 19.

Severe acute respiratory coronavirus virus 2 (SARS-CoV-2) seroconversion and occupational exposure of employees at a Swiss university hospital: A large longitudinal cohort study.

13. Martischang R, Iten A, Arm I, Abbas M, Meyer B, Yerly S, Eckerle I, Pralong J, Sauser J, Suard JC, Kaiser L, Pittet D, Harbarth S.

Infect Control Hosp Epidemiol. 2022 Mar;43(3):326-333. doi: 10.1017/ice.2021.117. Epub 2021 Mar 19.

Epidemiological, virological and serological investigation of a SARS-CoV-2 outbreak (Alpha variant) in a primary school: A prospective longitudinal study.

14. Lorthe E, Bellon M, Michielin G, Berthelot J, Zaballa ME, Pennacchio F, Bekliz M, Laubscher F, Arefi F, Perez-Saez J, Azman AS, L'Huillier AG, Posfay-Barbe KM, Kaiser L, Guessous I, Maerkl SJ, Eckerle I, Stringhini S; SEROCoV-Schools Study Group.

PLoS One. 2022 Aug 17;17(8):e0272663. doi: 10.1371/journal.pone.0272663. eCollection 2022.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The National Reference Center for Emerging Viral Diseases (CRIVE/NAVI) is a national reference laboratory by order of the Federal Office of Public Health. Its task is the detection of emerging and re-emerging viruses of all biosafety levels, especially hemorrhagic fever viruses and smallpox virus. The BSL4 unit is approved for diagnostic purposes only, which does not allow any culturing or enrichment of such viruses. The National Reference Center for Emerging Viral Diseases is part of the Laboratory of Virology at the University Hospitals of Geneva. Since the 1st anuary 2018, the CRIVE acts also as WHO National Center for Measles and Rubella.

The Laboratory of Virology (LV) performs the analysis of many viruses impacting the human health as done in most of the hospitals (HIV, Hepatitis, CMV, EBV, respiratory and enteric viruses, etc.). LV does most of the viral analysis needed by an university hospital.

LV also hosts the Swiss National Center for Influenza.

For further information please visit (website in French): https://www.hug-ge.ch/laboratoire-virologie

1. What is the name of the facility?
Institut für Virologie und Immunologie (Institute of Virology and Immunology)

2. Where is it located (include both address and geographical location)?
Institut für Virologie und Immunologie, Bundesamt für Lebensmittelsicherheit und Veterinärwesen, Eidgenössisches Departement des Innern, Sensemattstrasse 293, CH-3147 Mittelhäusern, Switzerland

N 46° 52' 50.20", E 7° 21' 46.81"

3. Floor area of laboratory areas by containment level:

BL 2: 600 SqM
BL 3: 100 SqM
ABL 3 Ag: 10000 SqM
Of note, ABL3Ag facilities have special features not comparable to standard BSL3 or BSL4 facilities. The shell is considered BSL4, whereas inside the containment area BSL1, BSL2 and BSL3 space is common standard. Personnel enters through a shower barrier and is provided with suitable laboratory clothing for BSL1, 2 and 3 inside the containment area. Personnel has to shower out when leaving the containment area and has to keep a 72h quarantine (no contact to cloven hoofed animals). The IVI fulfills the requirements of the EU Minimum Biorisk Management Standards for Laboratories Working with Foot-And-Mouth Disease Virus. Due to these special features of ABL3Ag facilities, the ABL3Ag area is not limited to laboratory units only, but also includes engineering floors such as effluent treatment plant or ventilation units and animal units, which are all located within the containment area. Therefore, all maintenance work has to be done during operation – the facility has never been shut down so far. This also means that a direct comparison with BSL4 facilities is not practicable. Licenses are as follows: "Study of African swine fever immunopathogenesis in domestic pigs"; "Quality controls of immuno-biological products for use in applications of veterinary medicine"; "Establishment of a cell-based rapid test to determine protection provided by vaccination against foot-and-mouth disease virus"; "Peste des petits ruminants virulence".

Total laboratory floor area (SqM):
10700

4. The organizational structure of each facility.

(i) Total number of personnel: 76

(ii) Division of personnel:
Military: 0
Civilian: 76

(iii) Division of personnel by category:
Scientists: 21
Engineers: 10
Technicians: 40
Administrative and support staff: 5

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Virology, immunology, veterinary medicine, vaccine control, diagnostics, development and validation of methods, biosafety, engineering, animal breeding, informatics

(v) Are contractor staff working in the facility? If so, provide an approximate number.
1

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Swiss Confederation (Federal Department of Home Affairs).

Research	20 %
Development	10 %
Test & Evaluation	5 %
Analysis / Diagnosis	25 %
Education & Training	10 %
Other activities	30 % (costs for safety, infrastructure and administration)

(vii) What are the funding levels for the following programme areas:

Research: 20 %
Development: 10 %
Test and evaluation: 5 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

Aicher, S.-M., Streicher, F., Chazal, M., Planas, D., Luo, D., Buchrieser, J., Nemcova, M., Seidlova, V., Zukal, J., Serra-Cobo, J., Pontier, D., Pain, B., Zimmer, G., Schwartz, O., Roingeard, P., Pikula, J., Dacheux, L., Jouvenet, N., and Heise, M.T. (2022) Species-specific molecular barriers to SARS-CoV-2 replication in bat cells. Journal of Virology 96:14, e00608-22. (PubMed) (article)

Alemayehu, G., Berhe, T., Gelan, E., Mokria, M., Jaldessa, J., Molu, J., Wieland, B., Knight-Jones, T., and Doyle, R.E. (2022) Animal welfare knowledge, attitudes, and practices among livestock holders in Ethiopia. Frontiers in Veterinary Science 9, 1006505. (PubMed) (article)

Annaheim, D., Vogler, B.R., Sigrist, B., Vögtlin, A., Hüssy, D., Breitler, C., Hartnack, S., Grund, C., King, J., Wolfrum, N., and Albini, S. (2022) Screening of healthy feral pigeons (Columba livia domestica) in the city of Zurich reveals continuous circulation of pigeon paramyxovirus-1 and a serious threat of transmission to domestic poultry. Microorganisms 10, 1656. (PubMed) (article)

Barut, G.T., Halwe, N.J., Taddeo, A., Kelly, J.N., Schön, J., Ebert, N., Ulrich, L., Devisme, C., Steiner, S., Trüeb, B.S., Hoffmann, B., Veiga, I.B., Leborgne, N.G.F., Moreira, E.A., Breithaupt, A., Wylezich, C., Höper, D., Wernike, K., Godel, A., Thomann, L., Flück, V., Stalder, H., Brügger, M., Esteves, B.I.O., Zumkehr, B., Beilleau, G.#, Kratzel, A., Schmied, K., Ochsenbein, S., Lang, R.M.#, Wider, M., Machahua, C., Dorn, P., Marti, T.M., Funke-Chambour, M., Rauch, A., Widera, M., Ciesek, S., Dijkman, R., Hoffmann, D., Alves, M.P., Benarafa, C., Beer, M., and Thiel, V. (2022) The spike gene is a major determinant for the SARS-CoV-2 Omicron-BA.1 phenotype. Nature Communications 13:1, 5929. (PubMed) (article)

Beer, J., Crotta, S., Breithaupt, A., Ohnemus, A., Becker, J., Sachs, B., Kern, L., Llorian, M., Ebert, N., Labroussaa, F., Thao, T.T.N.#, Trueeb, B.S., Jores, J., Thiel, V., Beer, M., Fuchs, J., Kochs, G., Wack, A., Schwemmle, M., and Schnepf, D. (2022) Impaired immune response drives age-dependent severity of COVID-19. Journal of Experimental Medicine 219:12, e20220621. (PubMed) (article)

Bonfoh, B., Wieland, B., Nguyen-Viet, H., and Kreppel, K. (2022) Editorial: Enhancing livestock production and food safety through a One Health approach in resource poor settings. Frontiers in Veterinary Science 9, 1079463. (PubMed) (article)

Brandys, P., Montagutelli, X., Merenkova, I., Barut, G.T., Thiel, V., Schork, N.J., Trüeb, B., Conquet, L., Deng, A., Antanasijevic, A., Lee, H.K., Valière, M., Sindhu, A., Singh, G., and Herold, J. (2022) A mRNA vaccine encoding for a RBD 60-mer nanoparticle elicits neutralizing antibodies and protective immunity against the SARS-CoV-2 Delta variant in transgenic K18-hACE2 mice. Frontiers in Immunology 13, 912898. (PubMed) (article)

Callegari, I., Schneider, M., Berloffa, G., Mühlethaler, T., Holdermann, S., Galli, E., Roloff, T., Boss, R., Infanti, L., Khanna, N., Egli, A., Buser, A., Zimmer, G., Derfuss, T., and Sanderson, N.S.R. (2022) Potent neutralization by monoclonal human IgM against SARS-CoV-2 is impaired by class switch. EMBO reports 23:7, e53956. (PubMed) (article)

de Martin, E.#, and Schweizer, M. (2022) Fifty shades of Erns: Innate immune evasion by the viral endonucleases of all pestivirus species. Viruses-Basel 14:2, 265. (PubMed) (article)

Démoulins, T., Baron, M.L., Gauchat, D., Kettaf, N., Reed, S.J., Charpentier, T., Kalinke, U., Lamarre, A., Ahmed, R., Sékaly, R.P., Sarkar, S., and Kalia, V. (2022) Induction of thymic atrophy and loss of thymic output by type-I interferons during chronic viral infection. Virology 567, 77-86. (PubMed) (article)

Démoulins, T., Brügger, M., Zumkehr, B., Oliveira Esteves, B.I., Ruggli, N., and Alves, M.P. (2022) Multiparameter flow cytometry assay to analyze the pulmonary T cell profiles in the ovine model of respiratory syncytial virus infection. STAR protocols 3:4, 101688. (PubMed) (article)

Dijkman, R., Verma, A.K., Selvaraj, M., Ghimire, R., Gad, H.H., Hartmann, R., More, S., Perlman, S., Thiel, V., and Channappanavar, R. (2022) Effective interferon lambda treatment regimen to control lethal MERS-CoV infection in mice. Journal of Virology 96:11, e00364-22. (PubMed) (article)

Dione, M.M., Séry, A., Sidibé, C.A.K., Wieland, B., and Fall, A. (2022) Exposure to multiple pathogens - serological evidence for Rift Valley fever virus, Coxiella burnetii, Bluetongue virus and Brucella spp. in cattle, sheep and goat in Mali. PLoS Neglected Tropical Diseases 16:4, e0010342. (PubMed) (article)

Eloiflin, R.-J., Grau-Roma, L., Python, S., Mehinagic, K.#, Godel, A., Libeau, G., Summerfield, A., Bataille, A., and García-Nicolás, O. (2022) Comparative pathogenesis of peste des petits ruminants virus strains of difference virulence. Veterinary Research 53:1, 57. (PubMed) (article)

Fahmi, A.#, Brügger, M.#, Zumkehr, B., Oliveira Esteves, B.I., Baud, D., and Alves, M.P. (2022) Generation of precision-cut slice cultures of human placenta. STAR protocols 3:2, 101291. (PubMed) (article)

Garza, M., Mohan, C.V., Brunton, L., Wieland, B., and Häsler, B. (2022) Typology of interventions for antimicrobial use and antimicrobial resistance in aquaculture systems in LMICs. International Journal of Antimicrobial Agents 59:1, 106495. (PubMed) (article)

Githaka, N.W., Kanduma, E.G., Wieland, B., Darghouth, M.A., and Bishop, R.P. (2022) Acaricide resistance in livestock ticks infesting cattle in Africa: Current status and potential mitigation strategies. Current Research in Parasitology & Vector-Borne Diseases 2, 100090. (PubMed) (article)

Gultom, M.#, Kratzel, A.#, Portmann, J., Stalder, H., Chanfon Bätzner, A., Gantenbein, H., Gurtner, C., Ebert, N., Gad, H.H., Hartmann, R., Posthaus, H., Zanolari, P., Pfaender, S., Thiel, V., and Dijkman, R. (2022) Establishment of well-differentiated camelid airway cultures to study Middle East respiratory syndrome coronavirus. Scientific Reports 12:1, 10340. (PubMed) (article)

Heinen, N., Marheinecke, C.S., Bessen, C., Blazquez-Navarro, A., Roch, T., Stervbo, U., Anft, M., Plaza-Sirvent, C., Busse, S., Klöhn, M., Schrader, J., Vidal Blanco, E., Urlaub, D., Watzl, C., Hoffmann, M., Pöhlmann, S., Tenbusch, M., Steinmann, E., Todt, D., Hagenbeck, C., Zimmer, G., Schmidt, W.E., Quast, D.R., Babel, N., Schmitz, I., and Pfänder, S. (2022) In-depth analysis of T cell immunity and antibody responses in heterologous prime-boost-boost vaccine regimens against SARS-CoV-2 and Omicron variant. Frontiers in Immunology 13, 1062210. (PubMed) (article)

Hume, A.J., Heiden, B., Olejnik, J., Suder, E.L., Ross, S., Scoon, W.A., Bullitt, E., Ericsson, M., White, M.R., Turcinovic, J., Thao, T.T.N., Hekman, R.M., Kaserman, J.E., Huang, J., Alysandratos, K.D., Toth, G.E., Jakab, F., Kotton, D.N., Wilson, A.A., Emili, A., Thiel, V., Connor, J.H., Kemenesi, G., Cifuentes, D., and Mühlberger, E. (2022) Recombinant Lloviu virus as a tool to study viral replication and host responses. PLoS Pathogens 18:2, e1010268. (PubMed) (article)

Kelly, J.N., Laloli, L.#, V'Kovski, P., Holwerda, M.#, Portmann, J., Thiel, V., and Dijkman, R. (2022) Comprehensive single cell analysis of pandemic influenza A virus infection in the human airways uncovers cell-type specific host transcriptional signatures relevant for disease progression and pathogenesis. Frontiers in Immunology 13, 978824. (PubMed) (article)

Laloli, L.#, Licheri, M.F., Probst, L.#, Licheri, M.#, Gultom, M., Holwerda, M., V'kovski, P., and Dijkman, R. (2022) Time-resolved characterization of the innate immune response in the respiratory epithelium of human, porcine, and bovine during influenza virus infection. Frontiers in Immunology 13, 970325. (PubMed) (article)

Lemma, M., Doyle, R., Alemayehu, G., Mekonnen, M., Kumbe, A., and Wieland, B. (2022) Using Community Conversations to explore animal welfare perceptions and practices of rural households in Ethiopia. Front. Vet. Sci. 9, 980192. (PubMed) (article)

Mac Kain, A., Maarifi, G., Aicher, S.M., Arhel, N., Baidaliuk, A., Munier, S., Donati, F., Vallet, T., Tran, Q.D., Hardy, A., Chazal, M., Porrot, F., OhAinle, M., Carlson-Stevermer, J., Oki, J., Holden, K., Zimmer, G., Simon-Lorière, E., Bruel, T., Schwartz, O., van der Werf, S., Jouvenet, N., Nisole, S., Vignuzzi, M., and Roesch, F. (2022) Identification of DAXX as a restriction factor of SARS-CoV-2 through a CRISPR/Cas9 screen. Nature Communications 13:1, 2442. (PubMed) (article)

Magouras, I., Schoster, A., Fouché, N., Gerber, V., Groschup, M.H., Ziegler, U., Fricker, R., Griot, C., and Vögtlin, A. (2022) Neurological disease suspected to be caused by tick-borne encephalitis virus infection in 6 horses in Switzerland. Journal of Veterinary Internal Medicine 36:6, 2254-2262. (PubMed) (article)

Mosena, A.C.S., Falkenberg, S.M., Ma, H., Casas, E., Dassanayake, R.P., Booth, R., De Mia, G.M., Schweizer, M., Canal, C.W., and Neill, J.D. (2021) Use of multivariate analysis to evaluate antigenic relationships between US BVDV vaccine strains and non-US genetically divergent isolates. Journal of Virological Methods 299, 114328. (PubMed) (article)

N'Guessan, N.B., Poupaud, M., Dieuzy-Labaye, I., Asfaw, Y.T., Wieland, B., Tesfu, F., Daniel, U., Tulayakul, P., and Peyre, M. (2022) Evaluation of public-private partnership in the veterinary domain using impact pathway methodology: in-depth case study in the poultry sector in Ethiopia. Frontiers in Veterinary Science 9, 735269. (PubMed) (article)

Niemeyer, D., Stenzel, S., Veith, T., Schroeder, S., Friedmann, K., Weege, F., Trimpert, J., Heinze, J., Richter, A., Jansen, J., Emanuel, J., Kazmierski, J., Pott, F., Jeworowski, L.M., Olmer, R., Jaboreck, M.C., Tenner, B., Papies, J., Walper, F., Schmidt, M.L., Heinemann, N., Möncke-Buchner, E., Baumgardt, M., Hoffmann, K., Widera, M., Thao, T.T.N., Balázs, A., Schulze, J., Mache, C., Jones, T.C., Morkel, M., Ciesek, S., Hanitsch, L.G., Mall, M.A., Hocke, A.C., Thiel, V., Osterrieder, K., Wolff, T., Martin, U., Corman, V.M., Müller, M.A., Goffinet, C., and Drosten, C. (2022) SARS-CoV-2 variant Alpha has a spike-dependent replication advantage over the ancestral B.1 strain in human cells with low ACE2 expression. PLoS Biology 20:11, e3001871. (PubMed) (article)

Nkamwesiga, J., Korennoy, F., Lumu, P., Nsamba, P., Mwiine, F.N., Roesel, K., Wieland, B., Perez, A., Kiara, H., and Muhanguzi, D. (2022) Spatio-temporal cluster analysis and transmission drivers for Peste des Petits Ruminants in Uganda. Transboundary and Emerging Diseases 69:5, e1642-e1658. (PubMed) (article)

Nohrborg, S., Dione, M.M., Winfred, A.C., Okello, L., Wieland, B., and Magnusson, U. (2022) Geographic and socioeconomic influence on knowledge and practices related to antimicrobial resistance among smallholder pig farmers in Uganda. Antibiotics 11:2, 251. (PubMed) (article)

Oba, P., Dione, M.M., Erume, J., Wieland, B., Mutisya, C., Ochieng, L., Cook, E.A.J., and Mwiine, F.N. (2022) Molecular characterization of porcine reproductive and respiratory syndrome virus (PRRSv) identified from slaughtered pigs in northern Uganda. BMC Veterinary Research 18:1, 176. (PubMed) (article)

Pan, R., Kindler, E., Cao, L., Zhou, Y., Zhang, Z., Liu, Q., Ebert, N., Züst, R., Sun, Y., Gorbalenya, A.E., Perlman, S., Thiel, V., Chen, Y., and Guo, D. (2022) N7-Methylation of the coronavirus RNA cap is required for maximal virulence by preventing innate immune recognition. mBio 13:1, e03662-21. (PubMed) (article)

Paslaru, A.I., Maurer, L.M., Vögtlin, A., Hoffmann, B., Torgerson, P.R., Mathis, A., and Veronesi, E. (2022) Putative roles of mosquitoes (Culicidae) and biting midges (Culicoides spp.) as mechanical or biological vectors of lumpy skin disease virus. Medical and Veterinary Entomology 36:3, 381-389. (PubMed) (article)

Radulovic, E., Mehinagic, K., Wüthrich, T., Hilty, M., Posthaus, H., Summerfield, A., Ruggli, N., and Benarafa, C. (2022) The baseline immunological and hygienic status of pigs impact disease severity of African swine fever. PLoS Pathogens 18:8, e1010522. (PubMed) (article)

Rossetti, G.G., Ossorio, M.A., Rempel, S., Kratzel, A.#, Dionellis, V.S., Barriot, S., Tropia, L., Gorgulla, C., Arthanari, H., Thiel, V., Mohr, P., Gamboni, R., and Halazonetis, T.D. (2022) Non-covalent SARS-CoV-2 Mpro inhibitors developed from in silico screen hits. Scientific Reports 12:1, 2505. (PubMed) (article)

Scalisi, N., Kuhnert, P., Amado, M.E.V., Overesch, G., Stärk, K.D.C., Ruggli, N., and Jores, J. (2022) Seroprevalence of Mycoplasma hyopneumoniae in sows fifteen years after implementation of a control programme for enzootic pneumonia in Switzerland. Veterinary Microbiology 270, 109455. (PubMed) (article)

Schaer, J., Cvetnic, Z., Sukalic, T., Dörig, S., Grisiger, M., Iscaro, C., Feliziani, F., Pfeifer, F., Origgi, F., Zanoni, R.G., and Abril, C.E. (2022) Evaluation of serological methods and a new real-time nested PCR for small ruminant lentiviruses. Pathogens 11:2, 129. (PubMed) (article)

Subissi, L., von Gottberg, A., Thukral, L., Worp, N., Oude Munnink, B.B., Rathore, S., Abu-Raddad, L.J., Aguilera, X., Alm, E., Archer, B.N., Attar Cohen, H., Barakat, A., Barclay, W.S., Bhiman, J.N., Caly, L., Chand, M., Chen, M., Cullinane, A., de Oliveira, T., Drosten, C., Druce, J., Effler, P., El Masry, I., Faye, A., Gaseitsiwe, S., Ghedin, E., Grant, R., Haagmans, B.L., Herring, B.L., Iyer, S.S., Kassamali, Z., Kakkar, M., Kondor, R.J., Leite, J.A., Leo, Y.S., Leung, G.M., Marklewitz, M., Moyo, S., Mendez-Rico, J., Melhem, N.M., Munster, V., Nahapetyan, K., Oh, D.Y., Pavlin, B.I., Peacock, T.P., Peiris, M., Peng, Z., Poon, L.L.M., Rambaut, A., Sacks, J., Shen, Y., Siqueira, M.M., Tessema, S.K., Volz, E.M., Thiel, V., van der Werf, S., Briand, S., Perkins, M.D., Van Kerkhove, M.D., Koopmans, M.P.G., and Agrawal, A. (2022) An early warning system for emerging SARS-CoV-2 variants. Nature Medicine 28:6, 1110-1115. (PubMed) (article)

Summerfield, A., Gerber, H., Schmitt, R., Liniger, M., Grazioli, S., and Brocchi, E. (2022) Relationship between neutralizing and opsonizing monoclonal antibodies against foot-and-mouth disease virus. Frontiers in Veterinary Science 9, 1033276. (PubMed) (article)

Taddeo, A., Veiga, I.B., Devisme, C., Boss, R., Plattet, P., Weigang, S., Kochs, G., Thiel, V., Benarafa, C., and Zimmer, G. (2022) Optimized intramuscular immunization with VSV-vectored spike protein triggers a superior immune response to SARS-CoV-2. npj Vaccines 7:1, 82. (PubMed) (article)

Talker, S.C., Barut, G.T., Lischer, H.E.L., Rufener, R., von Münchow, L., Bruggmann, R., and Summerfield, A. (2022) Monocyte biology conserved across species: Functional insights from cattle. Frontiers in Immunology 13, 889175. (PubMed) (article)

Teshome, D., Sori, T., Banti, T., Kidane, G., Wieland, B., and Alemayehu, G. (2022) Prevalence and risk factors of Brucella spp. in goats in Borana pastoral area, Southern Oromia, Ethiopia. Small Ruminant Research 206, 106594. (article)

Thomann, L., and Thiel, V. (2022) SARS-CoV-2 mimics a host protein to bypass defences. Nature 610:7931, 262-263. (PubMed) (article)

Ulrich, L., Halwe, N.J., Taddeo, A., Ebert, N., Schön, J., Devisme, C., Trüeb, B.S., Hoffmann, B., Wider, M., Fan, X., Bekliz, M., Essaidi-Laziosi, M., Schmidt, M.L., Niemeyer, D., Corman, V.M., Kraft, A., Godel, A., Laloli, L.#, Kelly, J.N., Calderon, B.M., Breithaupt, A., Wylezich, C., Veiga, I.B., Gultom, M.#, Osman, S., Zhou, B., Adea, K., Meyer, B., Eberhardt, C., Thomann, L., Gsell, M., Labroussaa, F., Jores, J., Summerfield, A., Drosten, C., Eckerle, I.A., Wentworth, D.E., Dijkman, R., Hoffmann, D., Thiel, V., Beer, M., and Benarafa, C. (2022) Enhanced fitness of SARS-CoV-2 variant of concern Alpha but not Beta. Nature 602:7896, 307-313. (PubMed) (article)

Waage, J., Grace, D., Fèvre, E.M., McDermott, J., Lines, J., Wieland, B., Naylor, N.R., Hassell, J.M., and Chan, K. (2022) Changing food systems and infectious disease risks in low-income and middle-income countries. The Lancet. Planetary Health 6:9, e760-e768. (PubMed) (article)

Walter, J.D., Scherer, M., Hutter, C.A.J., Garaeva, A.A., Zimmermann, I., Wyss, M., Rheinberger, J., Ruedin, Y., Earp, J.C., Egloff, P., Sorgenfrei, M., Hürlimann, L.M., Gonda, I., Meier, G., Remm, S., Thavarasah, S., van Geest, G., Bruggmann, R., Zimmer, G., Slotboom, D.J., Paulino, C., Plattet, P., and Seeger, M.A. (2022) Biparatopic sybodies neutralize SARS-CoV-2 variants of concern and mitigate drug resistance. EMBO reports 23:4, e54199. (PubMed) (article)

Wang, L., Moreira, E.A., Kempf, G., Miyake, Y., Oliveira Esteves, B.I., Fahmi, A.#, Schaefer, J.V., Dreier, B., Yamauchi, Y., Alves, M.P., Plückthun, A., and Matthias, P. (2022) Disrupting the HDAC6-ubiquitin interaction impairs infection by influenza and Zika virus and cellular stress pathways. Cell Reports 39:4, 110736. (PubMed) (article)

Wang, M., Bohórquez, J.A., Muñoz-González, S., Gerber, M., Alberch, M., Pérez-Simó, M., Abad, X., Liniger, M., Ruggli, N., and Ganges, L. (2022) Removal of the Erns RNase activity and of the 3' untranslated region polyuridine insertion in a low-virulence classical swine fever virus triggers a cytokine storm and lethal disease. Journal of Virology 96:14, e00438-22. (PubMed) (article)

Wenemark, M., Ngwili, N., Ndoboli, D., Wieland, B., and Roesel, K. (2022) “How are my age and cows related?” Cognitive interviewing as a tool to pretest survey questions in two limited resource settings. Front. Vet. Sci. 9, 833748. (PubMed) (article)

Wyss, M., Gradauskaite, V., Ebert, N., Thiel, V., Zurbriggen, A., and Plattet, P. (2022) Efficient recovery of attenuated canine distemper virus from cDNA. Virus Research 316, 198796. (PubMed) (article)

Zanoni, R.G. (2022) Letter to the Editor: Waiting period of the European Pet Travel Scheme (EU-PETS). Vaccine 40:15, 2241. (PubMed) (article)

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Institute of Virology and Immunology (IVI), associated with the Swiss Federal Food Safety and Veterinary Office, is the ISO 17025 accredited institute for the diagnosis, surveillance and control of highly contagious epizootics. As such the IVI is the national reference laboratory for >25 viral pathogens. In addition, the IVI pursues research both on these viruses and emerging viral diseases, as well as their potential transmission to man. The IVI is also the competent authority issuing the licenses required for the sale of veterinary immunobiological products. Basic research is carried out in the fields of immunology and virology, and involves influenza virus, African swine fever virus, peste des petits ruminants virus and new emergent viruses with zoonotic potential. An important research topic in 2022 was SARS-CoV-2. The development and diagnostics branches focus on assays and tests for various viral animal diseases. Through the cooperation with the University of Bern, the IVI is also

responsible for the teaching of virology and immunology at the Vetsuisse Faculty.

For further information please visit: https://www.ivi.admin.ch/ivi/en/home.html

1. What is the name of the facility?
Laboratoire de Bactériologie (Bacteriological Laboratory)

2. Where is it located (include both address and geographical location)?
Laboratoire de Bactériologie, Hôpitaux Universitaires de Genève, Rue Gabrielle Perret-Gentil 4, CH-1205 Genève 14, Switzerland

N 46° 11' 37.20", E 6° 8' 59.92"

3. Floor area of laboratory areas by containment level:
BL 2: 394 SqM
BL 3: 74 SqM

Total laboratory floor area (SqM):
468

4. The organizational structure of each facility.

(i) Total number of personnel: 6

(ii) Division of personnel:
Military: 0
Civilian: 6

(iii) Division of personnel by category:
Scientists: 2
Engineers: 0
Technicians: 4
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Medicine, infectious diseases, biology, microbiology, mycology, molecular biology, bacterial genetics

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Fribourg, Genève, Neuchâtel, Valais, Vaud.

Research	0 %
Development	5 %
Test & Evaluation	40 %
Analysis / Diagnosis	40 %
Education & Training	13 %
Other activities	2 % (costs for maintenance and administration)

(vii) What are the funding levels for the following programme areas:

Research: 0 %
Development: 5 %
Test and evaluation: 40 %

(viii) Briefly describe the publication policy of the facility:

Publication in peer-reviewed open literature.

NOTE There is a strong link between the Bacteriology Lab (LB) and the Genomic Research Lab (GRL) that is almost exclusively executing basic and applied research projects, under the joint leadership of Prof. Jacques Schrenzel. Translational research is actively promoted through this channel of cooperation.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

Diagnostic test accuracy of an automated device for the MALDI target preparation
Cherkaoui A,Riat A,Renzi G,Fischer A,Schrenzel J
Eur J Clin Microbiol Infect Dis. 2022 Dec 5. doi: 10.1007/s10096-022-04531-3.

Performance of the HiberGene Group B Streptococcus kit, a loop-mediated
Tittel-Elmer M,de Tejada BM,Renzi G,Schrenzel J

Fully Automated EUCAST Rapid Antimicrobial Susceptibility Testing (RAST) from
Cherkaoui A,Schorderet D,Azam N,Crudeli L,Fernandez J,Renzi G,Fischer A,Schrenzel J
J Clin Microbiol. 2022 Oct 19;60(10):e0089822. doi: 10.1128/jcm.00898-22. Epub

Missed pertussis diagnosis during co-infection with Bordetella holmesii.
de Lorenzi-Tognon M,Charretier Y,Iten A,Hafner C,Rosset-Zufferey S,Lemaitre B,Renzi G,Schrenzel J
Eur J Clin Microbiol Infect Dis. 2022 Oct;41(10):1227-1235. doi:

Transposon-Directed Insertion-Site Sequencing Reveals Glycolysis Gene gpmA as
Roth M,Goodall ECA,Pullela K,Jaquet V,François P,Henderson IR,Krause KH
Antioxidants (Basel). 2022 Oct 18;11(10):2053. doi: 10.3390/antiox11102053.

Strong Biofilm Formation and Low Cloxacillin Susceptibility in Biofilm-Growing
van der Mee-Marquet N,Dos Santos S,Diene SM,Duflot I,Mereghetti L,Valentin AS,François P,On Behalf Of The Spiadi Collaborative Group
Microorganisms. 2022 Sep 16;10(9):1857. doi: 10.3390/microorganisms10091857.

Teg58, a small regulatory RNA, is involved in regulating arginine biosynthesis
Manna AC,Leo S,Girel S,González-Ruiz V,Rudaz S,Francois P,Cheung AL

The central and biodynamic role of gut microbiota in critically ill patients.
Wozniak H,Beckmann TS,Fröhlich L,Soccorsi T,Le Terrier C,de Watteville A,Schrenzel J,Heidegger CP

Retrospective data analysis for definition of multidrug resistance in
Friedli O,Völlmy I,Schrenzel J,Harbarth S,Kronenberg A
Swiss Med Wkly. 2022 Jul 11;152:w30195. doi: 10.4414/smw.2022.w30195. eCollection

Synthèse du 7e symposium "Feeding the Microbiota» : prébiotiques et probiotiques
De Lorenzi-Tognon M,Genton L,Schrenzel J

Caution when using 1,3, β-D-glucan in the CSF as a biomarker of Candida albicans
Barbolini L,Riat A,Van Delden C,Schrenzel J
Int J Infect Dis. 2022 Sep;122:531-533. doi: 10.1016/j.ijid.2022.06.033. Epub

Mapping of etiologies of computed tomography-proven acute colitis: a prospective
Meyer J,Schrenzel J,Balaphas A,Delaune V,Abbas M,Morel P,Puppa G,Rubbia-Brandt L,Bichard P,Frossard JL,Toso C,Buchs NC,Ris F
Sci Rep. 2022 Jun 13;12(1):9730. doi: 10.1038/s41598-022-13868-w.

An interventional quasi-experimental study to evaluate the impact of a rapid
Martischang R,François P,Cherkaoui A,Renzi G,Fankhauser C,Schrenzel J,Pugin J,Harbarth S
Crit Care. 2022 Jun 7;26(1):166. doi: 10.1186/s13054-022-04027-8.

Quality of MALDI-TOF mass spectra in routine diagnostics: results from an
Cuénod A,Aerni M,Bagutti C,Bayraktar B,Boz ES,Carneiro CB,Casanova C,Coste AT,Damborg P,van Dam DW,Demirci M,Drevinek P,Dubuis O,Fernandez J,Greub G,Hrabak J,Hürkal Yigitler G,Hurych J,Jensen TG,Jost G,Kampinga GA,Kittl S,Lammens C,Lang C,Lienhard R,Logan J,Maffioli C,Marekovic I,Marschal M,Moran-Gilad J,Nolte O,Oberle M,Pedersen M,Pflüger V,Pranghofer S,Reichl J,Rentenaar RJ,Riat A,Rodríguez-Sánchez B,Schilt C,Schlotterbeck AK,Schrenzel J,Troib S,Willems E,Wootton M,Ziegler D,Egli A
Clin Microbiol Infect. 2022 May 25:S1198-743X(22)00273-7. doi:

Contribution of Clinical Metagenomics to the Diagnosis of Bone and Joint Infections
d'Humières C,Gaïa N,Gueye S,de Lastours V,Leflon-Guibout V,Maataoui N,Duprilot M,Lecronier M,Rousseau MA,Gamany N,Lescure FX,Senard O,Deconinck L,Dollat M,Isernia V,Le Hur AC,Petitjean M,Nazimoudine A,Le Gac S,Chalal S,Ferreira S,Lazarevic V,Guigon G,Gervasi G,Armand-Lefèvre L,Schrenzel J,Ruppé E
Front Microbiol. 2022 Apr 21;13:863777. doi: 10.3389/fmicb.2022.863777.

Comparative genomics analysis of two Helcococcus kunzii strains co-isolated with Staphylococcus aureus from diabetic foot ulcers
Durand BARN,Yahiaoui Martinez A,Baud D,François P,Lavigne JP,Dunyach-Remy C
Genomics. 2022 Apr 9;114(3):110365. doi: 10.1016/j.ygeno.2022.110365.

Bacteremia Detection in Second or Subsequent Blood Cultures Among Hospitalized Patients in a Tertiary Care Hospital
Zanella MC,de Lorenzi-Tognon M,Fischer A,Vernaz N,Schrenzel J
JAMA Netw Open. 2022 Apr 1;5(4):e228065. doi: 10.1001/jamanetworkopen.2022.8065.

Agrobacterium species bacteraemia, Switzerland, 2008 to 2019: a molecular epidemiological study
Balmer L,Seth-Smith HMB,Egli A,Casanova C,Kronenberg A,Schrenzel J,Marschall J,Sommerstein R
Antimicrob Resist Infect Control. 2022 Mar 9;11(1):47. doi:

Transcriptomic Analysis of E. coli after Exposure to a Sublethal Concentration of Hydrogen Peroxide Revealed a Coordinated Up-Regulation of the Cysteine Biosynthesis Pathway
Roth M,Jaquet V,Lemeille S,Bonetti EJ,Cambet Y,François P,Krause KH

Total Laboratory Automation for Rapid Detection and Identification of Microorganisms and Their Antimicrobial Resistance Profiles
Cherkaoui A,Schrenzel J
Front Cell Infect Microbiol. 2022 Feb 3;12:807668. doi:

Mycobacterium chelonae Infection Identified by Metagenomic Next-Generation Sequencing as the Probable Cause of Acute Contained Rupture of a Biological Composite Graft-A Case Report
Büchler AC,Lazarevic V,Gaïa N,Girard M,Eckstein F,Egli A,Sutter ST,Schrenzel J
Int J Mol Sci. 2021 Dec 29;23(1):381. doi: 10.3390/ijms23010381.

Changes in the gut bacterial communities in colon cancer surgery patients: an observational study
Abbas M,Gaïa N,Buchs NC,Delaune V,Girard M,Andrey DO,Meyer J,Schrenzel J,Ris F,Harbarth S,Lazarevic V
Gut Pathog. 2022 Jan 4;14(1):2. doi: 10.1186/s13099-021-00477-7.

Nontuberculous Mycobacteria under Scrutiny in the Geneva Area (2015-2020)
Vongthilath-Moeung R,Plojoux J,Poncet A,Renzi G,Veziris N,Schrenzel J,Janssens JP
Respiration. 2022;101(4):367-375. doi: 10.1159/000520033. Epub 2021 Dec 7.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Bacteriological Laboratory, which is part of the University Hospitals of Geneva, is the Regional Competence Center for the primary analysis of bacteriological samples suspicious of a bioterror-related background. Protocols for the detection of bacteria causing anthrax, plague, tularemia and brucellosis have been established in close collaboration with the National Reference Center for Highly Pathogenic Bacteria. Furthermore, there is a strong link between the Bacteriological Laboratory and the Genomic Research Laboratory that is almost exclusively executing basic and applied research projects under joint leadership. Translational research is actively promoted through this channel of cooperation.

For further information please visit (website in French): http://www.hug-ge.ch/laboratoire-bacteriologie

1. What is the name of the facility?

Laboratoires de Diagnostic de l'Institut de Microbiologie (Diagnostic Laboratories of the Institute of Microbiology)

2. Where is it located (include both address and geographical location)?

Laboratoires de Diagnostic de l'Institut de Microbiologie, Département de Pathologie et Médecine de Laboratoire, Centre Hospitalier Universitaire Vaudois, Rue du Bugnon 48, CH-1011 Lausanne, Switzerland

N 46° 31' 30.57", E 6° 38' 29.15"

3. Floor area of laboratory areas by containment level:

BL 3: 93 SqM
BL 2: 596 SqM

Total laboratory floor area (SqM):
689

4. The organizational structure of each facility.

(i) Total number of personnel: 21

(ii) Division of personnel:
Military: 0
Civilian: 21

(iii) Division of personnel by category:
Scientists: 7
Engineers: 0
Technicians: 14
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Bacteriology, mycology, parasitology, virology, biosafety, bioinformatics

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Fribourg, Genève, Neuchâtel, Valais, Vaud.

Research	0 %
Development	5 %
Test & Evaluation	10 %
Analysis / Diagnosis	50 %
Education & Training	15 %
Other activities	20 %

(vii) What are the funding levels for the following programme areas:

Research: 0 %
Development: 5 %
Test and evaluation: 10 %

(viii) Briefly describe the publication policy of the facility:

Publication in peer-reviewed open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

1. Post-COVID-19 Syndrome in Outpatients: a Cohort Study.
Desgranges F, Tadini E, Munting A, Regina J, Filippidis P, Viala B, Karachalias E, Suttels V, Haefliger D, Kampouri E, Van Singer M, Tschopp J, Rochat Stettler L, Schaad S, Brahier T, Hugli O, Mueller Y, Gouveia A, Opota O, Carron PN, Guery B, Papadimitriou-Olivgeris M, Boillat-Blanco N; , the RegCOVID Research Group.
J Gen Intern Med. 2022 Jun;37(8):1943-1952. doi: 10.1007/s11606-021-07242-1. Epub 2022 Mar 22.

2. [Pulmonary tularemia : a diagnosis not to be missed].
Uriel Valladares P, Opota O, Beigelman-Aubry C, Bochud PY, Lamoth F.
Rev Med Suisse. 2022 Apr 13;18(777):707-711. doi: 10.53738/REVMED.2022.18.777.707.

3. A refractory tenosynovitis of the wrist: a case report.
Boudon A, Opota O, Dan D.
J Med Case Rep. 2022 Feb 21;16(1):75. doi: 10.1186/s13256-022-03278-x.

4. External Quality Assessment of SARS-CoV-2 Sequencing: an ESGMD-SSM Pilot Trial across 15 European Laboratories.
Wegner F, Roloff T, Huber M, Cordey S, Ramette A, Gerth Y, Bertelli C, Stange M, Seth-Smith HMB, Mari A, Leuzinger K, Cerutti L, Harshman K, Xenarios I, Le Mercier P, Bittel P, Neuenschwander S, Opota O, Fuchs J, Panning M, Michel C, Hallin M, Demuyser T, De Mendonca R, Savelkoul P, Dingemans J, van der Veer B, Boers SA, Claas ECJ, Coolen JPM, Melchers WJG, Gunell M, Kallonen T, Vuorinen T, Hakanen AJ, Bernhoff E, Hetland MAK, Golan Berman H, Adar S, Moran-Gilad J, Wolf DG, Leib SL, Nolte O, Kaiser L, Schmutz S, Kufner V, Zaheri M, Trkola A, Aamot HV, Hirsch HH, Greub G, Egli A.
J Clin Microbiol. 2022 Jan 19;60(1):e0169821. doi: 10.1128/JCM.01698-21. Epub 2021 Nov 10.

5. Assessment of SARS-CoV-2 tests costs and reimbursement tariffs readjustments during the COVID-19 pandemic.
Caruana G, Brouillet R, Opota O, Greub G.
Swiss Med Wkly. 2022 May 13;152:w30168. doi: 10.4414/smw.2022.w30168. eCollection 2022 May 9.

6. Antibody response and intra-host viral evolution after plasma therapy in COVID-19 patients pre-exposed or not to B-cell-depleting agents.
Gachoud D, Pillonel T, Tsilimidos G, Battolla D, Dumas D, Opota O, Fontana S, Vollenweider P, Manuel O, Greub G, Bertelli C, Rufer N.
Br J Haematol. 2022 Nov;199(4):549-559. doi: 10.1111/bjh.18450. Epub 2022 Sep 13.

7. Utility of Polymerase Chain Reaction in Nasopharyngeal Swabs for Identifying Respiratory Bacteria Causing Community-Acquired Pneumonia.
Demars Y, Brahier T, Rotzinger DC, Brouillet R, Jaton K, Opota O, Boillat-Blanco N.
Microbiol Spectr. 2022 Jun 29;10(3):e0037922. doi: 10.1128/spectrum.00379-22. Epub 2022 May 18.

8. Comparison of Nasopharyngeal and Saliva Swab Nucleic Acid Amplification and Rapid Antigen Testing To Detect Omicron SARS-CoV-2 Variant of Concern: a Prospective Clinical Trial (OMICRON).
Kritikos A, Caruana G, Lazor-Blanchet C, Currat M, Chiche JD, Vollenweider P, Bart PA, Opota O, Greub G.
Microbiol Spectr. 2022 Dec 21;10(6):e0392322. doi: 10.1128/spectrum.03923-22. Epub 2022 Nov 8.

9. A battery of tandem mass spectrometry assays with stable isotope-dilution for the quantification of 15 anti-tuberculosis drugs and two metabolites in patients with susceptible-, multidrug-resistant- and extensively drug-resistant tuberculosis.
Mercier T, Desfontaine V, Cruchon S, Da Silva Pereira Clara JA, Briki M, Mazza-Stalder J, Kajkus A, Burger R, Suttels V, Buclin T, Opota O, Koehler N, Sanchez Carballo PM, Lange C, André P, Decosterd LA, Choong E.
J Chromatogr B Analyt Technol Biomed Life Sci. 2022 Nov 15;1211:123456. doi: 10.1016/j.jchromb.2022.123456. Epub 2022 Sep 20.

Antigen rapid tests, nasopharyngeal PCR and saliva PCR to detect SARS-CoV-2: A prospective comparative clinical trial.
10. Schwob JM, Miauton A, Petrovic D, Perdrix J, Senn N, Gouveia A, Jaton K, Opota O, Maillard A, Minghelli G, Cornuz J, Greub G, Genton B, D'Acremont V.
PLoS One. 2023 Feb 24;18(2):e0282150. doi: 10.1371/journal.pone.0282150. eCollection 2023.

Performance of microbiological tests for tuberculosis diagnostic according to the type of respiratory specimen: A 10-year retrospective study.
11. Boldi MO, Denis-Lessard J, Neziri R, Brouillet R, von-Garnier C, Chavez V, Mazza-Stalder J, Jaton K, Greub G, Opota O.
Front Cell Infect Microbiol. 2023 Mar 2;13:1131241. doi: 10.3389/fcimb.2023.1131241. eCollection 2023.

Overruling of Procalcitonin-Guided Antibiotics for Lower Respiratory Tract Infections in Primary Care: Ancillary Study of a Randomized Controlled Trial.
12. Knüsli J, Lhopitallier L, Kronenberg A, Meuwly JY, Opota O, Perrenoud MA, Page MA, Kain KC, Mamin A, D'Acremont V, Senn N, Mueller Y, Locatelli I, Boillat-Blanco N.
Antibiotics (Basel). 2023 Feb 12;12(2):377. doi: 10.3390/antibiotics12020377.

Rectal shedding of monkeypox virus in a patient coinfected with Chlamydia trachomatis and Neisseria gonorrhoeae: a case report.
13. Desgranges F, Glampedakis E, Christinet V, Encarnação S, Fernandes C, Greub G, Opota O, Cavassini M.
J Med Case Rep. 2023 Mar 6;17(1):94. doi: 10.1186/s13256-023-03826-z.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Diagnostic Laboratories of the Institute of Microbiology, which are part of the University Hospital of Lausanne, are the Regional Competence Center for the primary analysis of samples suspicious of a bioterror-related background. Due to its other diagnostic activities, it is able to cover the whole spectrum of microbiology, namely virology, bacteriology, mycology and parasitology. Bacteriology also includes mycobacteriology, for which the Institute of Microbiology acts as a regional center.

Moreover, in 2017, we obtained the necessary funds for the up-grade and the expansion of our BSL3 level laboratory in the Institute of Microbiology. The construction started in September 2018 and finished in March 2020. During this period all these activities were carried out in the research BSL3 laboratory of our Institute according to the good laboratories practices recommended.

The new BSL3 laboratory stand as the reference BSL3 laboratory of the hospital (CHUV) for the diagnosis and manipulation of BSL3 samples, strains, microorganisms that may be encountered in daily work as well as the samples of the environment for the regional laboratory network.

For further information please visit:
https://www.chuv.ch/en/microbiologi e/imu-home/diagnostics/

1. What is the name of the facility?

Medizinische Mikrobiologie (Medical Microbiology)

2. Where is it located (include both address and geographical location)?

Medizinische Mikrobiologie, Labormedizin, Luzerner Kantonsspital, Luzerner Kantonsspital Haus 47, Spitalstrasse, CH-6000 Luzern 16, Switzerland

N 47° 3' 32.45", E 8° 18' 1.17"

3. Floor area of laboratory areas by containment level:

BL 2: 716 SqM
BL 3: 62 SqM

Total laboratory floor area (SqM):

778

4. The organizational structure of each facility.

(i) Total number of personnel: 7

(ii) Division of personnel:
Military: 0
Civilian: 7

(iii) Division of personnel by category:
Scientists: 3
Engineers: 0
Technicians: 4
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Clinical microbiology (all disciplines; diagnostics and applied research).

(v) Are contractor staff working in the facility? If so, provide an approximate number.

0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Luzern, Nidwalden, Obwalden, Schwyz, Uri.

Research	0 %
Development	0 %
Test & Evaluation	15 %
Analysis / Diagnosis	75 %
Education & Training	10 %
Other activities	0 %

(vii) What are the funding levels for the following programme areas:

Research: 0 %
Development: 0 %
Test and evaluation: 15 %

(viii) Briefly describe the publication policy of the facility:

Publication in peer-reviewed journals.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

No publicly available papers or reports published in 2022.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Department of Medical Microbiology, as part of the Labormedizin, Luzerner Kantonsspital, is accredited (ISO / EN 17025) for clinical bacteriology, mycology, mycobacteriology, parasitology, molecular diagnostics, serology. The current focus of applied research activities is on specific bacteriological / molecular testing topics. In addition, it is the Regional Competence Center for primary analyses of samples suspicious of a bioterror-related background.

For further information please visit (website in German):
https://www.luks.ch/standorte/standort-luzern/labormedizin

1. What is the name of the facility?
Institut für Medizinische Mikrobiologie (Institute of Medical Microbiology)

2. Where is it located (include both address and geographical location)?
Institut für Medizinische Mikrobiologie, Medizinische Fakultät, Universität Zürich, Gloriastrasse 28/30, CH-8006 Zürich, Switzerland

N 47° 22' 36.20", E 8° 33' 11.18"

3. Floor area of laboratory areas by containment level:
BL 3: 20 SqM

Total laboratory floor area (SqM):
20

4. The organizational structure of each facility.

(i) Total number of personnel: 4

(ii) Division of personnel:
Military: 0
Civilian: 4

(iii) Division of personnel by category:
Scientists: 3
Engineers: 0
Technicians: 1
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Microbiology (bacteriology / mycology).

(v) Are contractor staff working in the facility? If so, provide an approximate number.
3

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Appenzell Ausserrhoden, Appenzell Innerrhoden, Glarus, Graubünden, Sankt Gallen, Schaffhausen, Thurgau, Zug, Zürich, and the Principality of Liechtenstein.

Research	15 %
Development	15 %
Test & Evaluation	5 %
Analysis / Diagnosis	60 %
Education & Training	5 %
Other activities	0 %

(vii) What are the funding levels for the following programme areas:

Research: 15 %
Development: 15 %
Test and evaluation: 5 %

(viii) Briefly describe the publication policy of the facility:

Publication in peer-reviewed open access literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

The 2021 WHO catalogue of Mycobacterium tuberculosis complex mutations associated with drug resistance: a genotypic analysis.
Walker TM, Miotto P, Koser CU, Fowler PW, Knaggs J, Iqbal Z, Hunt M, Chindelevitch L, Farhat M, Cirillo DM, Comas I, Posey J, Omar SV, Peto TEA, Suresh A, Uplekar S, Laurent S, Colman RE, Nathanson CM, Zignol M, Walker AS, Crook DW, Ismail N, Rodwell TC, CRyPTIC Consortium, Seq and Treat Consortium (Bottger EC) (2022)
Lancet Microbe 3: e265-e273

Consensus management recommendations for non-tuberculous mycobacterial pulmonary diseases.
Lange C, Bottger EC, Cambau E, Griffith DE, Guglielmetti L, van Ingen J, Knight SL, Marras TK, Oliver KN, Santin M, Stout JE, Tortoli E, Wagner D, Winthrop K, Daley CL, on behalf of the expert panel group for management recommendations in NTM-PD (2022)
Lancet Infect Dis 22: e178-e190

High-throughput functional characterization of protein phosphorylation sites in yeast.
Viéitez C, Busby BP, Ochoa D, Mateus A, Memon D, Galardini M, Yildiz U, Trovato M, Jawed A, Geiger AG, Oborská-Oplová M, Potel CM, Vonesch SC, Szu Tu C, Shahraz M, Stein F, Steinmetz LM, Panse VG, Noh KM, Savitski MM, Typas A, Beltrao P (2021)
Nat Biotechnol 40: 382-390

The aminoglycoside modifying enzyme Eis2 represents a new potential in vivo target for reducing antimicrobial drug resistance in Mycobacterium abscessus complex.
Lorè NI, Saliu F, Spitaleri A, Schafle D, Nicola F, Cirillo DM, Sander P (2022)
Eur Respir J 60: 2201541

Updating the approaches to define susceptibility and resistance to anti-tuberculosis agents: implications for diagnosis and treatment.
Antimycobacterial Susceptibility Testing Group (2022)
Eur Respir J 59: 166-166

Fatty acid transporter MFSD2A is a multifunctional gatekeeper in brain and placenta.
Walter JD, Remm S, Seeger MA (2022)
Nat Struct Mol Biol 29: 504-506

Aquimarins, peptide antibiotics with amino-modified C-termini from a sponge-derived Aquimarina sp. bacterium.
Dieterich CL, Probst SI, Ueoka R, Sandu I, Schafle D, Dal Molin M, Minas HA, Costa R, Oxenius A, Sander P, Piel J (2022)
Angew Chem Int Ed Engl 61: e202115802

Short synthesis of (+)-actinobolin: simple entry to complex small-molecule inhibitors of protein synthesis.
Tharra PR, Mikhaylov AA, Svejkar J, Gysin M, Hobbie SN, Svenda J (2022)
Angew Chem Int Ed Engl 61: e202116520

Apramycin susceptibility of multidrug-resistant Gram-negative blood culture isolates in five countries in South-East Asia.
Gysin M, Hon PY, Tan P, Sengduangphachanh A, Simmalavong M, Hinfonthong P, Kaewphaderm N, Pham TD, Nguyen TH, Haldimann K, Becker K, van Doorn R, Hopkins J, Simpson AJH, Ashley, EA, Kesteman T, Tran HH, Vasoo S, Ling CL, Roberts T, Turner P, Hobbie SN (2022)
Int J Antimicrob Agents: Online ahead of print

Premature aging in mice with error-prone protein synthesis.
Shcherbakov D, Nigri M, Akbergenov R, Brilkova M, Mantovani M, Petit Isnard P, Grimm A, Karol AA, Teo Y, Sanchón AC , Kumar Y, Eckert A, Thiam K, Seebeck P, Wolfer DP, Bottger EC (2022)
Sci Adv 8: eabl9051

Translational in vitro and in vivo PKPD modelling for apramycin against Gram-negative lung pathogens to facilitate prediction of human efficacious dose in pneumonia.
Aranzana-Climent V, Hughes D, Cao S, Tomczak M, Urbas M, Zabicka D, Lundberg CV, Hansen J, Lindberg J, Hobbie SN, Friberg LE (2022)
Clin Microbiol Infect 28: 1367-1374

Error-prone protein synthesis recapitulates early symptoms of Alzheimer disease in aging mice.
Brilkova M, Nigri M, Kumar HS, Moore J, Mantovani M, Keller C, Grimm A, Eckert A, Shcherbakov D, Akbergenov R, Seebeck P, Kramer SD, Wolfer DP, Gent TC, Bottger EC (2022)
Cell Rep 40: 111433

Photochemically-mediated inflammation and cross-presentation of Mycobacterium bovisBCG proteins stimulates strong CD4 and CD8 T-cell responses in mice.
Waeckerle-Men Y, Kotkowska ZK, Bono G, Duda A, Kolm I, Varypataki EM, Amstutz B, Meuli M, Hogset A, Kundig TM, Halin C, Sander P, Johansen P (2022)
Front Immunol 13: 815609

Optimization of the antimicrobial peptide Bac7 by deep mutational scanning.
Koch P, Schmitt S, Heynisch A, Gumpinger A, Wuthrich I, Gysin M, Shcherbakov D, Hobbie SN, Panke S, Held M (2022)
BMC Biol 20: 114

Phenotype of Mrps5-associated phylogenetic polymorphisms is intimately linked to mitoribosomal misreading.
Juskeviciene R, Fritz A-K, Brilkova M, Akbergenov R, Schmitt K, Rehrauer H, Laczko E, Isnard Petit P, Thiam K, Eckert A, Schacht J, Wolfer DP, Bottger EC, Shcherbakov D (2022)
Int J Mol Sci 23: 4384

In vitro bedaquiline and clofazimine susceptibility testing in Mycobacterium abscessus.
Schulthess B, Aktogan Kittana FN, Homke R, Sander P (2022)
Antimicrob Agents Chemother 66: e023462

Apramycin overcomes the inherent lack of antimicrobial bactericidal activity in Mycobacterium abscessus.
Selchow P, Ordway DJ, Verma D, Whittel N, Petrig A, Hobbie SN, Bottger EC, Sander P (2022)
Antimicrob Agents Chemother 66: e0151021

Population pharmacokinetics of apramycin from first-in-human plasma and urine data to support prediction of efficacious dose.
Zhao C, Chirkova A, Rosenborg S, Palma Vilar R, Lindberg J, Hobbie SN, Friberg LE (2022)
J Antimicrob Chemother: Online ahead of print

Migration of Acanthamoeba through Legionella biofilms is regulated by the bacterial Lqs-LvbR network, effector proteins and the flagellum.
Hochstrasser R, Michaelis S, Brulisauer S, Sura T, Fan M, Maaß S, Becher D, Hilbi H (2022)
Environ Microbiol 24: 3672-3692

The Legionella Lqs-LvbR regulatory network controls temperature-dependent growth onset and bacterial cell density.
Hochstrasser R, Hilbi H (2022)
Appl Environ Microbiol 88: e0237021

PE51 mediates uptake of trehalose across the mycomembrane of Mycobacterium tuberculosis.
Babu Sait MR, Koliwer-Brandl H, Stewart JA, Swarts BM, Jacobsen M, Ioerger TR, Kalscheuer R (2022)
Sci Rep 12: 2097

PACK-CXL vs. antimicrobial therapy for bacterial, fungal, and mixed infectious keratitis: a prospective randomized phase 3 trial.
Hafezi F, Hosny M, Shetty R, Knyazer B, Chen S, Wang Q, Hashemi H,Torres-Netto EA, and the PACK-CXL Working Group: Zhang H., Bora'l A, Tawfeek M, Nagaraja H, d'Souza S, Asgari S, Mirsalim A, Chorny A, Krakauer Y, Pajic B, Gilardoni F, Hafezi N, Hillen M, Liu N, Boldi MO, Tabibian D, Torgerson PR, Zbinden R, Koliwer-Brandl H, Randleman JB (2022)
Eye Vis 9: 2

Structure-activity relationships for 5 modifications of 4,5-aminoglycoside antibiotics.
Quirke JCK, Sati GC, Sounousi A, Gysin M, Haldimann K, Bottger EC, Vasella A, Hobbie SN, Crich D (2022)
ChemMedChem 17: e202200120

Impact of MALDI-TOF MS identification on anaerobic species and genus diversity in routine diagnostics.
Bachli P, Baars S, Simmler A, Zbinden R, Schulthess B (2022)
Anaerobe 75: 102554

Panzytopenie und akutes Nierenversagen.
Greiner M, Treichler G, Morel C, Camenzind D, Neumayer A, Blum J, Beer JH (2022)
Swiss Medical Forum 22: 487-490

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Institute of Medical Microbiology at the University of Zurich is the Regional Competence Center for the primary analysis of bacteriological samples suspicious of a bioterror-related background. This represents an additional and not a continuous task of the diagonstics laboratory proficient in bacteriology, mycology and serology. Research focusses on vaccine and antibiotic development, protein structure analysis, host-pathogen interaction (Legionella, Mycobacteria), antibiotic resistance mechanisms and general aspects of translation.

For further information please visit (website in french):
https://www.imm.uzh.ch/de/francais.html

1. What is the name of the facility?
Institut für Medizinische Virologie (Institute of Medical Virology)

2. Where is it located (include both address and geographical location)?
Institut für Medizinische Virologie, Medizinische Fakultät, Universität Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland

N 47° 23' 52.08", E 8° 33' 01.92"

3. Floor area of laboratory areas by containment level:

BL 3: 25 SqM
Of note, the Institute of Medical Virology holds a BSL4 license for diagnostic purposes only, as follows: "Inactivation or extraction of environmental samples or samples with potentially highly pathogenic viruses for diagnostic purposes".

Total laboratory floor area (SqM):
25

4. The organizational structure of each facility.

(i) Total number of personnel: 2

(ii) Division of personnel:
Military: 0
Civilian: 2

(iii) Division of personnel by category:
Scientists: 1
Engineers: 0
Technicians: 1
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Microbiology (virology).

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Appenzell Ausserrhoden, Appenzell Innerrhoden, Glarus, Graubünden, Sankt Gallen, Schaffhausen, Thurgau, Zug, Zürich, and the Principality of Liechtenstein.

Research	0 %
Development	0 %
Test & Evaluation	10 %
Analysis / Diagnosis	50 %
Education & Training	10 %
Other activities	30 % (costs for maintenance and amortization)

(vii) What are the funding levels for the following programme areas:

Research: 0 %
Development: 0 %
Test and evaluation: 10 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

Comparison of analytical sensitivity and efficiency for SARS-CoV-2 primer sets by TaqMan-based and SYBR Green-based RT-qPCR.
Tao, Yile; Yue, Yang; Qiu, Guangyu; Ji, Zheng; Spillman, Martin; Gai, Zhibo; Chen, Qingfa; Bielecki, Michel; Huber, Michael; Trkola, Alexandra; Wang, Qiyuan; Cao, Junji; Wang, Jing (2022).
Applied Microbiology and Biotechnology, 106(5-6):2207-2218.

Increasing Frequency and Transmission of HIV-1 Non-B Subtypes among Men Who Have Sex with Men in the Swiss HIV Cohort Study.
Duran Ramirez, Jessy J; Ballouz, Tala; Nguyen, Huyen; Kusejko, Katharina; Chaudron, Sandra E; Huber, Michael; Hirsch, Hans H; Perreau, Matthieu; Ramette, Alban; Yerly, Sabine; Cavassini, Matthias; Stöckle, Marcel; Furrer, Hansjakob; Vernazza, Pietro; Bernasconi, Enos; Günthard, Huldrych F; Kouyos, Roger D; Swiss HIV Cohort Study (2022).
Journal of Infectious Diseases, 225(2):306-316.

Correction to: Identifying and Characterizing Trans Women in the Swiss HIV Cohort Study as an Epidemiologically Distinct Risk Group.
Nguyen, Huyen; Hampel, Benjamin; Nuñez, David Garcia; Battegay, Manuel; Hachfeld, Anna; Bernasconi, Enos; Calmy, Alexandra; Cavassini, Matthias; Vernazza, Pietro; Fellay, Jacques; Rudolph, Hannes; Huber, Michael; Leuzinger, Karoline; Perreau, Matthieu; Scherrer, Alexandra; Ramette, Alban Nicolas; Yerly, Sabine; Günthard, Huldrych F; Kouyos, Roger D; Kusejko, Katharina (2022).
Clinical Infectious Diseases, 74(12):2266.

Identifying and Characterizing Trans women in the Swiss HIV Cohort Study as an Epidemiologically Distinct Risk Group.
Nguyen, Huyen; Hampel, Benjamin; Nuñez, David Garcia; Battegay, Manuel; Hachfeld, Anna; Bernasconi, Enos; Calmy, Alexandra; Cavassini, Matthias; Vernazza, Pietro; Fellay, Jacques; Rudolph, Hannes; Huber, Michael; Leuzinger, Karoline; Perreau, Matthieu; Scherrer, Alexandra; Ramette, Alban Nicolas; Yerly, Sabine; Günthard, Huldrych F; Kouyos, Roger D; Kusejko, Katharina; Swiss HIV Cohort Study (2022).
Clinical Infectious Diseases, 74(8):1468-1475.

A Systematic Molecular Epidemiology Screen Reveals Numerous Human Immunodeficiency Virus (HIV) Type 1 Superinfections in the Swiss HIV Cohort Study.
Chaudron, Sandra E; Leemann, Christine; Kusejko, Katharina; Nguyen, Huyen; Tschumi, Nadine; Marzel, Alex; Huber, Michael; Böni, Jürg; Perreau, Matthieu; Klimkait, Thomas; Yerly, Sabine; Ramette, Alban; Hirsch, Hans H; Rauch, Andri; Calmy, Alexandra; Vernazza, Pietro; Bernasconi, Enos; Cavassini, Matthias; Metzner, Karin J; Kouyos, Roger D; Günthard, Huldrych F (2022).
Journal of Infectious Diseases, 226(7):1256-1266.

Similar But Different: Integrated Phylogenetic Analysis of Austrian and Swiss HIV-1 Sequences Reveal Differences in Transmission Patterns of the Local HIV-1 Epidemics.
Kusejko, Katharina; Tschumi, Nadine; Chaudron, Sandra E; Nguyen, Huyen; Battegay, Manuel; Bernasconi, Enos; Böni, Jürg; Huber, Michael; Calmy, Alexandra; Cavassini, Matthias; Egle, Alexander; Grabmeier-Pfistershammer, Katharina; Haas, Bernhard; Hirsch, Hans; Klimkait, Thomas; Öllinger, Angela; Perreau, Matthieu; Ramette, Alban; Flury, Baharak Babouee; Sarcletti, Mario; Scherrer, Alexandra; Schmid, Patrick; Yerly, Sabine; Zangerle, Robert; Günthard, Huldrych F; Kouyos, Roger D (2022).
Journal of Acquired Immune Deficiency Syndromes, 90(4):e4-e12.

Cohort Profile Update: The Swiss HIV Cohort Study (SHCS).
Scherrer, Alexandra U; Traytel, Anna; Braun, Dominique L; Calmy, Alexandra; Battegay, Manuel; Cavassini, Matthias; Furrer, Hansjakob; Schmid, Patrick; Bernasconi, Enos; Stoeckle, Marcel; Kahlert, Christian; Trkola, Alexandra; Kouyos, Roger D; Tarr, Philip; Marzolini, Catia; Wandeler, Gilles; Fellay, Jacques; Bucher, Heiner; Yerly, Sabine; Suter, Franziska; Hirsch, Hans; Huber, Michael; Dollenmaier, Günter; Perreau, Matthieu; Martinetti, Gladys; Rauch, Andri; Günthard, Huldrych F; Swiss HIV Cohort Study (2022).
International Journal of Epidemiology, 51(1):33-34j. Item availability may be restricted.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Institute of Medical Virology at the University of Zurich is the Regional Competence Center for the primary analysis of viral samples suspicious of a bioterror-related background. This represents an additional and not a continuous task of the viral diagnostics laboratory.

For further information please visit:
https://www.virology.uzh.ch/en.html

1. What is the name of the facility?

Kantonales Laboratorium Basel-Stadt (Cantonal Laboratory of Basel-Stadt)

2. Where is it located (include both address and geographical location)?

Kantonales Laboratorium Basel-Stadt, Bereich Gesundheitsschutz, Gesundheitsdepartement des Kantons Basel-Stadt, Kannenfeldstrasse 2, CH-4056 Basel, Switzerland

N 47° 33' 43.48", E 7° 34' 26.85"

3. Floor area of laboratory areas by containment level:

BL 2: 14 SqM
BL 3: 36 SqM

Total laboratory floor area (SqM):

50

4. The organizational structure of each facility.

(i) Total number of personnel: 4

(ii) Division of personnel:
Military: 0
Civilian: 4

(iii) Division of personnel by category:
Scientists: 2
Engineers: 0
Technicians: 2
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Microbiology, molecular biology, chemistry, inspection.

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Cantons of Aargau, Basel-Landschaft, Basel-Stadt, Solothurn.

Research	0 %
Development	15 %
Test & Evaluation	40 %
Analysis / Diagnosis	40 %
Education & Training	5 %
Other activities	0 %

(vii) What are the funding levels for the following programme areas:

Research: 0 %
Development: 15 %
Test and evaluation: 40 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

No publicly available papers or reports published in the reporting period.

Notes:
N/A

Attachments:
N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Cantonal Laboratory of Basel-Stadt is the Regional Competence Center for the primary analysis of samples suspicious of a bioterror-related background. The Regional Laboratory North is also appointed reference laboratory by the Federal Office of Environment for the two following fields of activities: Analysis of samples taken in and around laboratories subjected to the Containment Ordinance, and analysis of samples taken in the environment for the surveillance of the Release Ordinance.

The Cantonal Laboratory of Basel-Stadt has been co-author for the "Chemical Inactivation of Organisms in Liquids - Guidelines for the chemical inactivation of organisms in liquid cultures or supernatants with proof of efficacy and safe disposal" and is working out specific SOP for chemical inactivation of microorganisms attn. Federal Office of Public Health FOPH.

Microbiological and molecular biological methods have been established for the identification of a wide range of microorganisms in environmental samples, including relevant pathogens such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Bacillus anthracis*, as well as adenoviruses and lentiviruses. Further methods for the detection of bioterror agents have been implemented according to the Regional Laboratory Network.

For further information please visit (website in German):
https://www.kantonslabor.bs.ch/

1. What is the name of the facility?

Istituto Microbiologia (Institute of Microbiology)

2. Where is it located (include both address and geographical location)?

Istituto Microbiologia, Stabile E4050 Dipartimento Ambiente Costruzioni e Design, Scuola Universitaria Professionale della Svizzera Italiana, Via Mirasole 22A, CH-6500 Bellinzona, Switzerland

N46° 11' 53.50", E9° 1' 10.25"

3. Floor area of laboratory areas by containment level:

BL 2: 185 SqM
BL 3: 38 SqM

Total laboratory floor area (SqM):

223

4. The organizational structure of each facility.

(i) Total number of personnel: 6

(ii) Division of personnel:
Military: 0
Civilian: 6

(iii) Division of personnel by category:
Scientists: 5
Engineers: 0
Technicians: 1
Administrative and support staff: 0

(iv) List the scientific disciplines represented in the scientific/engineering staff.

Bacteriology, mycology, molecular microbiology, microbial ecology, entomology, vector biology.

(v) Are contractor staff working in the facility? If so, provide an approximate number.
0

(vi) What is (are) the source(s) of funding for the work conducted in the facility, including indication if activity is wholly or partly financed by the Ministry of Defence?

Canton of Ticino.

Research	10 %
Development	10 %
Test & Evaluation	30 %
Analysis / Diagnosis	30 %
Education & Training	5 %
Other activities	15 % (administrative and maintenance costs)

(vii) What are the funding levels for the following programme areas:

Research: 10 %
Development: 10 %
Test and evaluation: 30 %

(viii) Briefly describe the publication policy of the facility:

Publication in open literature.

(ix) Provide a list of publicly-available papers and reports resulting from the work published during the previous 12 months. (To include authors, titles and full references)

Frei G., S. Peduzzi, S. Stoll, & A. Bruder (2022) Assessment of microplastic contamination on lakeshores of Lake Lugano. Bollettino della Società Ticinese di Scienze Naturali 110: 71-81

Oester R., P. C. dos Reis Oliveira, M. S. Moretti, F. Altermatt & A. Bruder (2022): Leaf-associated macroinvertebrate assemblage and leaf litter breakdown in headwater streams depend on local riparian vegetation. Hydrobiologia. https://doi.org/10.1007/s10750-022-05049-7

Zare-Shahraki M., E. Ebrahimi Dorche, A. Bruder, J. Flotemersch, K. A. Blocksom & D. Bănăduc (2022) Fish species composition, distribution and community structure in relation to environmental variation in a semi-arid mountainous river basin, Iran. Water 14: 2226

Fathi P., E. Ebrahimi-Dorche, M. Zare-Shahraki, J. Stribling, O. Beyraghdar-Kashkooli, Ali Reza Esmaeili Ofogh & A. Bruder (2022) Revised Iranian Water Quality Index (RIWQI): a tool for the assessment and management of water quality in Iran. Environmental Monitoring and Assessment 194: 504

König, R.; Cuomo, M.; Pianta, E.; Buetti, A.; Mauri, F.; Tanadini, M.; Principi, P. (2022) Addition of Conductive Materials to Support Syntrophic Microorganisms in Anaerobic Digestion. Fermentation 8, 354. https://doi.org/10.3390/fermentation8080354

Balestrino F, Bouyer J, Vreysen MJB and Veronesi E (2022) Impact of Irradiation on Vector Competence of Aedes aegypti and Aedes albopictus (Diptera: Culicidae) for Dengue and Chikungunya Viruses. Front. Bioeng. Biotechnol. 10:876400. doi: 10.3389/fbioe.2022.876400

Saini J., Hassler C., Cable R., Fourquez M., Danza F., Roman S., Tonolla M., Storelli N., Jacquet S., Evgeny M., Zdobnov EM., Melissa B,. Duhaime M. (2022) Bacterial, Phytoplankton, and Viral Distributions and Their Biogeochemical Contexts in Meromictic Lake Cadagno Offer Insights into the Proterozoic Ocean Microbial Loop. mBio, 6, https://doi.org/10.1128/mbio.00052-22

Miranda M., Barceló C., Arnoldi D., […], Consortium Aim-cost/aim-surv , AIMSurv (2022) First pan-European harmonized surveillance of Aedes invasive mosquito species of relevance for human vector-borne diseases, Gigabyte https://doi.org/10.46471/gigabyte.58

Fathi P., E. Ebrahimi-Dorche, Beyraghdar-Kashkooli, J. Stribling & A. Bruder (2022). Development of the Karun macroinvertebrate tolerance index (KMTI) for semi arid mountainous streams in Iran. Environmental Monitoring and Assessment 194: 421

Ravasi D., Mangili F., Huber D., Azzimonti L., Engeler L., Vermes N., Del Rio G., Guidi V., Tonolla M. and Flacio E. (2022) Risk-based mapping tools for surveillance and control of the invasive mosquito Aedes albopictus in Switzerland. International Journal of Environmental Research and Public Health 2022, 19, 3220. https://doi.org/10.3390/ ijerph19063220

Rota, T., A. Lecerf, E. Chauvet & B. Pey. (2022). The importance of intraspecific variation in litter consumption rate of aquatic and terrestrial macro-detritivores. Basic and Applied Ecology https://doi.org/10.1016/j.baae.2022.06.003.

Zare-Shahraki M., E. Ebrahimi Dorche, Y. Keivany, K. A. Blocksom, A. Bruder & J. Flotemersch (2022) A fish-based multi-metric assessment index in the Karun River Basin, Iran. River Research and Applications 38(3): 573-594

Oester R., Greenway R., Moosmann M., Sommaruga R., Tartarotti B., Brodersen J. & Blake Matthews (2022). The influence of predator community composition on photoprotective traits of copepods. Ecology and Evolution 12(4): e8862

Fathi P., E. Ebrahimi-Dorche, O. Beyraghdar-Kashkooli, J. Stribling & A. Bruder (2022): Spatiotemporal variation in macroinvertebrate community composition along the stressor gradients in rivers of a middle-eastern basin. International Journal of Environmental Science and Technology 19, 8587–8612.

Kuemmerlen M., A. Batista-Morales, A. Bruder, E. Turak, F. de Oliveira Roque (2022): Conservation of Latin America freshwater biodiversity: beyond political borders. Biodiversity and Conservation 31, 1427–1433

Costello D., T. Scott, […], A. Bruder et al. (2022) Global patterns and controls of nutrient immobilization on decomposing cellulose in riverine ecosystems. Global Biogeochemical Cycles 36(3): e2021GB007163

Alijani Mamaghani N., Saremi H., Javan-Nikkhah M., De Respinis S., Pianta E., Tonolla M. (2022) Endophytic Cephalotrichum spp. from Solanum tuberosum (potato) in Iran – a polyphasic analysis, Sydowia 47: 287-301. DOI 10.12905/0380.sydowia74-2022-0287

Ravasi D., Mangili F., Huber D., Azzimonti L., Engeler L., Vermes N., Del Rio G., Guidi V., Tonolla M., Flacio E. (2022). Risk-based mapping tools for surveillance and control of the invasive mosquito Aedes albopictus in Switzerland. Environ. Res. Public Health 19: 3220.

Ravasi D., Mangili F., Huber D., Cannata M., Strigaro D., Flacio E. (2022). The effects of microclimatic winter conditions in urban areas on the risk of establishment for Aedes albopictus. Scientific Reports 12: 15967.

Pichler V, Caputo B, Valadas V, et al. (2022) Geographic distribution of the V1016G knockdown resistance mutation in Aedes albopictus: a warning bell for Europe. Parasit Vectors. 15(1):280. doi: 10.1186/s13071-022-05407-3.

Notes:

N/A

Attachments:

N/A

5. Briefly describe the biological defence work carried out at the facility, including type(s) of micro-organisms [9] and/or toxins studied, as well as outdoor studies of biological aerosols.

The Istituto Microbiologia is the center of reference in the field of microbiology south of the Alps. Aspects of public health, environmental hygiene, microbial ecology and biotechnology converge in a unified vision of microbiology that considers human, animal and environmental health as a whole in a larger concept of "one health". The Istituto Microbiologia is the Regional Competence Center South of Alps for the primary analysis of samples suspicious of a bioterror-related background.

For further information please visit (website in Italian): http://www.supsi.ch/im

Confidence-Building Measure "B"

Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins

At the Third Review Conference it was agreed that States Parties continue to implement the following:

> Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins, and on all such events that seem to deviate from the normal pattern as regards type, development, place, or time of occurrence. The information provided on events that deviate from the norm will include, as soon as it is available, data on the type of disease, approximate area affected, and number of cases.

The Seventh Review Conference agreed the following:

> No universal standards exist for what might constitute a deviation from the normal pattern.

Modalities

The Third Review Conference agreed on the following, later amended by the Seventh Review Conference:

1. Exchange of data on outbreaks that seem to deviate from the normal pattern is considered particularly important in the following cases:

> - When the cause of the outbreak cannot be readily determined or the causative agent [10] is difficult to diagnose,
>
> - When the disease may be caused by organisms which meet the criteria for risk groups III or IV, according to the classification in the latest edition of the WHO Laboratory Biosafety Manual,
>
> - When the causative agent is exotic to a given geographical region,
>
> - When the disease follows an unusual pattern of development,
>
> - When the disease occurs in the vicinity of research centres and laboratories subject to exchange of data under item A,
>
> - When suspicions arise of the possible occurrence of a new disease.

2. In order to enhance confidence, an initial report of an outbreak of an infectious disease or a similar occurrence that seems to deviate from the normal pattern should be given promptly after cognizance of the outbreak and should be followed up by annual reports. To enable States Parties to follow a standardized procedure, the Conference has agreed that Form B should be used, to the extent information is known and/or applicable, for the exchange of annual information.

3. The declaration of electronic links to national websites or to websites of international, regional or other organizations which provide information on disease outbreaks (notably outbreaks of infectious diseases and similar occurrences caused by toxins that seem to deviate from the normal pattern) may also satisfy the declaration requirement under Form B.

4. In order to improve international cooperation in the field of peaceful bacteriological (biological) activities and in order to prevent or reduce the occurrence of ambiguities, doubts and suspicions, States Parties are encouraged to invite experts from other States Parties to assist in the handling of an outbreak, and to respond favourably to such invitations, respecting applicable national legislation and relevant international instruments.

Form B

Information on outbreaks of infectious diseases and similar occurrences, that seem to deviate from the normal pattern[11]

Human Diseases

1. Time of cognizance of the outbreak:
N/A

2. Location and approximate area affected:

N/A

N/A

3. Type of disease/intoxication:
N/A

4. Suspected source of disease/intoxication:
N/A

5. Possible causative agent(s):
N/A

6. Main characteristics of systems:
N/A

7. Detailed symptoms, when applicable
N/A

- Respiratory:
N/A

- Circulatory:
N/A

- Neurological/behavioural:
N/A

- Intestinal:
N/A

- Dermatological:
N/A

- Nephrological:
N/A

- Other:
N/A

8. Deviation(s) from the normal pattern as regards

- Type:
N/A

- Development:

N/A

- Place of occurrence:
N/A

- Time of occurrence:

- Symptoms:
N/A

- Virulence pattern:
N/A

- Drug resistance pattern:
N/A

- Agent(s) difficult to diagnose:
N/A

- Presence of unusual vectors:
N/A

- Other:
N/A

9. Approximate number of primary cases:
N/A

10. Approximate number of total cases:
N/A

11. Number of deaths:

12. Development of the outbreak:

13. Measures taken:
N/A

Notes:

The Swiss Federal Office of Public Health (FOPH) is responsible for the surveillance and reporting of human diseases. A nationwide notification system is regulated by the Ordinance on the Declaration of Observations of Communicable Human Diseases (*RS 818.101.126 Ordonnance du DFI du 1 décembre 2015 sur la déclaration d'observations en rapport avec les maladies transmissibles de l'homme*), which is based on the Federal Act on the Control of Communicable Human Diseases (*RS 818.101 Loi fédérale du 28 septembre 2012 sur la lutte contre les maladies transmissibles de l'homme*) . Every medical practitioner and laboratory is obliged to report the occurrence or identification of certain notifiable diseases. The current situation is accessible online and data is transmitted to the World Health Organization (WHO):
https://www.bag.admin.ch/bag/fr/home/zahlen-und-statistiken/zahlen-zu-infektionskrankheiten/meldepflichtige-infektionskrankheiten---woechentliche-fallzahlen.html

Updated data on the situation concerning the SARS-CoV-2/COVID-19 pandemic in Switzerland can be found here:
https://www.covid19.admin.ch/en/overview

Attachments:

N/A

Animal diseases

1. Time of cognizance of the outbreak:
N/A

2. Location and approximate area affected:

N/A

N/A

3. Type of disease/intoxication:
N/A

4. Suspected source of disease/intoxication:
N/A

5. Possible causative agent(s):
N/A

6. Main characteristics of systems:
N/A

7. Detailed symptoms, when applicable
N/A

- Respiratory:
N/A

- Circulatory:
N/A

- Neurological/behavioural:
N/A

- Intestinal:
N/A

- Dermatological:
N/A

- Nephrological:
N/A

- Other:
N/A

8. Deviation(s) from the normal pattern as regards

- Type:
N/A

- Development:
N/A

- Place of occurrence:
N/A

- Time of occurrence:

- Symptoms:
N/A

- Virulence pattern:
N/A

- Drug resistance pattern:
N/A

- Agent(s) difficult to diagnose:
N/A

- Presence of unusual vectors:
N/A

- Other:
N/A

9. Approximate number of primary cases:
N/A

10. Approximate number of total cases:
N/A

11. Number of deaths:

12. Development of the outbreak:

13. Measures taken:
N/A

Notes:

The Swiss Federal Food Safety and Veterinary Office (FSVO) is responsible for the surveillance and reporting of animal diseases. According to the Federal Law on Animal Epidemics (*RS 916.40 Loi du 1er juillet 1966 sur les épizooties*) and the corresponding ordinance (*RS 916.401 Ordonnance du 27 juin 1995 sur les épizooties*), notifiable animal diseases have to be reported to the FSVO which in turn is responsible for the reporting to the World Organization for Animal Health (OIE). The current situation is accessible online:
https://www.infosm.blv.admin.ch/bulletin

No outbreaks of infectious diseases or similar occurrences that seemed to deviate from the normal pattern in terms of animal diseases were observed during the reporting period.

Attachments:
N/A

Plant diseases and pests

1. Time of cognizance of the outbreak:
N/A

2. Location and approximate area affected:

N/A

N/A

3. Type of disease/intoxication:
N/A

4. Suspected source of disease/intoxication:
N/A

5. Possible causative agent(s):
N/A

6. Main characteristics of systems:
N/A

7. Detailed symptoms, when applicable
N/A

- Respiratory:
N/A

- Circulatory:
N/A

- Neurological/behavioural:
N/A

- Intestinal:
N/A

- Dermatological:
N/A

- Nephrological:
N/A

- Other:
N/A

8. Deviation(s) from the normal pattern as regards

- Type:
N/A

- Development:
N/A

- Place of occurrence:
N/A

- Time of occurrence:

- Symptoms:
N/A

- Virulence pattern:
N/A

- Drug resistance pattern:
N/A

- Agent(s) difficult to diagnose:
N/A

- Presence of unusual vectors:
N/A

- Other:
N/A

9. Approximate number of primary cases:
N/A

10. Approximate number of total cases:
N/A

11. Number of deaths:

12. Development of the outbreak:

13. Measures taken:
N/A

Notes:

The Swiss Federal Plant Protection Service (FPPS) is responsible for any kind of phytosanitary measures in order to prevent the introduction and spread of particularly harmful pests and diseases that affect plants and plant products. The FPPS is run jointly by the Swiss Federal Office for Agriculture (FOAG) and the Swiss Federal Office for the Environment (FOEN). The FOAG is responsible for the sector of agricultural and horticultural crops, whereas the FOEN is responsible for forest plants, wood and wood products, including invasive plants. According to the Federal Law on Agriculture (*RS 910.1 Loi fédérale du 29 avril 1998 sur l'agriculture*) and the corresponding ordinance (*RS 916.20 Ordonnance du 31 octobre 2018 sur la protection des végétaux*), notifiable plant diseases and pests are reported to either the FOAG or the FOEN that transmit reports to the European and Mediterranean Plant Protection Organization (EPPO). Reporting of invasive plants to the FOEN, which then communicates with the EPPO, is primarily regulated in the Ordinance on the Release of Organisms into the Environment (*RS 814.911 Ordonnance du 10 septembre 2008 sur l'utilisation d'organismes dans l'environnement*).

Information on outbreaks of infectious diseases and similar occurrences that seem to deviate from the normal pattern in terms of plant diseases and pests that occurred during the reporting period is provided in the form of short descriptions of notifications made by the National Plant Protection Organisation of Switzerland to the EU Commission by means of the EUROPHYT-Outbreak system as follows:

No.	Europhyt Outbreak No.	Description
01	1847	Pest:*Anisandrus maiche* Host plant / Soil / Trap: Trap July 2022

02	1860	Pest: *Popillia japonica* Host plant / Soil / Trap: Trap July 2022
03	1872	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* August 2022
04	1886	Pest: *Anoplophora glabripennis* Host plant / Soil / Trap: Maple tree October 2022
05	1902	Pest: Tomato brown rugose fruit virus Host plant / Soil / Trap: *Solanum lycopersicum* September 2022
06	1910	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* September 2022
07	1911	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* September 2022
08	1912	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* September 2022
09	1913	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* September 2022
10	1914	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* September 2022
11	1938	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* October 2022
12	1939	Pest: Grapevine flavescence dorée phytoplasma Host plant / Soil / Trap: *Vitis vinifera* October 2022

13	1940	Pest: *Xylosandrus crassiusculus* Host plant / Soil / Trap: Botanical garden October 2022
14	1944	Pest: Tomato brown rugose fruit virus Host plant / Soil / Trap: *Solanum lycopersicum* October 2022
15	1966	Pest: Tomato brown rugose fruit virus Host plant / Soil / Trap: *Solanum lycopersicum* October 2022
16	1972	Pest: *Globodera pallida* Host plant / Soil / Trap: Soil October 2022
17	1980	Pest: *Cyclorhipidion pelliculosum* Host plant / Soil / Trap: Trap October 2022
18	1981	Pest: *Cyclorhipidion fukiense* Host plant / Soil / Trap: Trap October 2022
19	1997	Pest: *Meloidogyne enterolobii* Host plant / Soil / Trap: Soil November 2022
20	2034	Pest: *Globodera pallida* Host plant / Soil / Trap: Soil, Potatoes December 2022
21	2049	Pest: *Meloidogyne enterolobii* Host plant / Soil / Trap: Soil, *Solanum lycopersicum* December 2022
22	2055	Pest: Tomato brown rugose fruit virus Host plant / Soil / Trap: *Solanum lycopersicum* December 2022

Attachments:
N/A

Confidence-Building Measure "C"

Encouragement of publication of results and promotion of use of knowledge

At the Third Review Conference it was agreed that States parties continue to implement the following:

> Encouragement of publication of results of biological research directly related to the Convention, in scientific journals generally available to States parties, as well as promotion of use for permitted purposes of knowledge gained in this research.

Modalities

The Third Review Conference agreed on the following:

1. It is recommended that basic research in biosciences, and particularly that directly related to the Convention should generally be unclassified and that applied research to the extent possible, without infringing on national and commercial interests, should also be unclassified.

2. States parties are encouraged to provide information on their policy as regards publication of results of biological research, indicating, inter alia, their policies as regards publication of results of research carried out in research centres and laboratories subject to exchange of information under item A and publication of research on outbreaks of diseases covered by item B, and to provide information on relevant scientific journals and other relevant scientific publications generally available to States parties.

3. The Third Review Conference discussed the question of cooperation and assistance as regards the safe handling of biological material covered by the Convention. It concluded that other international forums were engaged in this field and expressed its support for efforts aimed at enhancing such cooperation.

Comments:

Switzerland does not impose any restrictions on the publication of basic and applied research in biosciences related to the Convention:

- CBM “A”:
  No restrictions implemented on the publication of research carried out within the frameworks of the National Biological Defense Program and the Regional Laboratory Network as well as their contractors.
- CBM “B”:
  No restrictions implemented on the publication of research. Full cooperation with international organizations (WHO, OIE, EPPO) in their respective frameworks.
- CBM “G”:
  Public institutions (universities, institutes, hospitals, state-run facilities): No restrictions implemented on the publication of research.
  Private companies: Publication of research is encouraged, however, companies are responsible for their own publication policy that are in line with the protection of any commercial interests.

Publishers of scientific and medical journals and other publications based in Switzerland:

Birkhäuser Verlag AG, Basel: https://www.springer.com/gp/birkhaeuser
EMH Schweizerischer Ärzteverlag AG, Muttenz: https://www.emh.ch/en/read
Frontiers Media SA, Lausanne: https://www.frontiersin.org/
Inderscience Publishers, Genève: https://www.inderscience.com/
MDPI AG, Basel: https://www.mdpi.com/
S. Karger AG, Basel: https://www.karger.com/
SciPress Ltd., Bäch: https://www.scipress.com/
WHO Press, Genève: https://apps.who.int/bookorders

Confidence-Building Measure "D"

(Deleted)

Confidence-Building Measure "E"

Declaration of legislation, regulations and other measures

At the Third Review Conference the States parties agreed to implement the following, later amended by the Seventh Review Conference:

As an indication of the measures which they have taken to implement the Convention, States parties shall declare whether they have legislation, regulations or other measures:

(a) To prohibit and prevent the development, production, stockpiling, acquisition or retention of the agents, toxins, weapons, equipment and means of delivery specified in Article I of the Convention, within their territory or anywhere under their jurisdiction or under their control anywhere;

(b) In relation to the export or import of micro-organisms pathogenic to man, animals and plants or of toxins in accordance with the Convention;

(c) In relation to biosafety and biosecurity.

States parties shall complete the attached form (Form E) and shall be prepared to submit copies of the legislation or regulations, or written details of other measures on request to the Implementation Support Unit (ISU) within the United Nations Office for Disarmament Affairs or to an individual State party. On an annual basis States parties shall indicate, also on the attached form, whether or not there has been any amendment to their legislation, regulations or other measures.

Form E

Declaration of legislation, regulations and other measures

Relating to	*Legislation*	*Regulations*	*Other measures*[12]	*Amended since last year*
(a) Development, production stockpiling, acquisition or retention of microbial or other biological agents, or toxins, weapons, equipment and means of delivery specified in Article I	yes	yes	yes	yes
(b) Exports of micro-organisms[13] and toxins	yes	yes	yes	yes
(c) Imports of micro-organisms[13] and toxins	yes	yes	yes	yes
(d) Biosafety[14] and biosecurity[15]	yes	yes	yes	yes

Additional information to Form E:

Switzerland adheres to a monistic system, i.e. treaties of international law become effective upon ratification and are part of the Swiss Federal Legislation. This fact is reflected as follows:

Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (*RS 0.515.07 Convention du 10 avril 1972 sur l'interdiction de la mise au point, de la fabrication et du stockage des armes bactériologiques (biologiques) ou à toxines et sur leur destruction*)
https://www.fedlex.admin.ch/eli/cc/1976/1438_1439_1439/fr

Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (*RS 0.515.105 Protocole du 17 juin 1925 concernant la prohibition d'emploi à la guerre de gaz asphyxiants, toxiques ou similaires et de moyens bactériologiques*)
https://www.fedlex.admin.ch/eli/cc/48/375_387_405/fr

Legislation and regulations concerned with the implementation of the Convention in Switzerland is detailed as follows:

Federal Constitution of the Swiss Confederation (*RS 101 Constitution fédérale de la Confédération suisse du 18 avril 1999*)
https://www.fedlex.admin.ch/eli/cc/1999/404/fr

Federal Act on Measures Ensuring Homeland Security (*RS 120 Loi fédérale du 21 mars 1997 instituant des mesures visant au maintien de la sûreté intérieure*)
https://www.fedlex.admin.ch/eli/cc/1998/1546_1546_1546/fr

Ordinance on the Intelligence Service (*RS 121.1 Ordonnance du 16 août 2017 sur le Service de renseignement*)
https://www.fedlex.admin.ch/eli/cc/2017/495/fr

Ordinance on Information and Storage Systems of the Intelligence Service of the Confederation (*RS 121.2 Ordonnance du 16 août 2017 sur les systèmes d'information et les systèmes de stockage de données du Service de renseignement de la Confédération*)
https://www.fedlex.admin.ch/eli/cc/2017/496/fr

Federal Act on the Prohibition of « al-Qaeda » and « Islamic State » Groups and related Organizations (*RS 122 Loi fédérale du 12 décembre 2014 interdisant les groupes « Al-Qaïda » et « État islamique » et les organisations apparentées*)
https://www.fedlex.admin.ch/eli/cc/2014/764/fr

Ordinance on the Federal Expert Commission for Biosafety (*RS 172.327.8 Ordonnance du 20 novembre 1996 sur la Commission fédérale d'experts pour la sécurité biologique*)
https://www.fedlex.admin.ch/eli/cc/1997/6_6_6/fr
Establishes the roles of the Federal Commission of Experts for Biological Security to ensure the protection of the Swiss population against transmissible diseases, the health of workers, and the protection of animals and plants and their environments.

Swiss Criminal Code (*RS 311.0 Code pénal suisse du 21 décembre 1937*)
https://www.fedlex.admin.ch/eli/cc/54/757_781_799/fr

Swiss Code of Criminal Procedure (*RS 312.0 Code de procédure pénale suisse du 5 octobre 2007*)
https://www.fedlex.admin.ch/eli/cc/2010/267/fr

Ordinance on the Communication of Penal Decisions Taken by Cantonal Authorities (*RS 312.3 Ordonnance du 10 novembre 2004 réglant la communication des décisions pénales prises par les autorités cantonales*)
https://www.fedlex.admin.ch/eli/cc/2004/729/fr

Military Criminal Code (*RS 321.0 Code pénal militaire du 13 juin 1927*)
https://www.fedlex.admin.ch/eli/cc/43/359_375_369/fr

Federal Act on International Legal Aid in Criminal Cases (*RS 351.1 Loi fédérale du 20 mars 1981 sur l'entraide internationale en matière pénale*)
https://www.fedlex.admin.ch/eli/cc/1982/846_846_846/fr

Federal Act on Main Offices of Criminal Investigation Departments of the Confederation (*RS 360 Loi fédérale du 7 octobre 1994 sur les Offices centraux de police criminelle de la Confédération*)
https://www.fedlex.admin.ch/eli/cc/1995/875_875_875/fr

Ordinance on the Information System of the Federal Criminal Police (*RS 360.2 Ordonnance du 15 octobre 2008 sur le système informatisé de la Police judiciaire fédérale*)
https://www.fedlex.admin.ch/eli/cc/2008/697/fr

Ordinance on the National Central Bureau Interpol Bern (*RS 366.1 Ordonnance du 21 juin 2013 concernant le Bureau central national Interpol Bern*)
https://www.fedlex.admin.ch/eli/cc/2013/466/fr

Ordinance on the Coordinated Medical Service (*RS 501.31 Ordonnance du 27 avril 2005 sur le Service sanitaire coordonné*)
https://www.fedlex.admin.ch/eli/cc/2005/345/fr

Federal Act on the Army and the Military Administration (*RS 510.10 Loi fédérale du 3 février 1995 sur l'armée et l'administration militaire*)
https://www.fedlex.admin.ch/eli/cc/1995/4093_4093_4093/fr

Ordinance on Measures Taken by the Army against Human and Animal Epidemics (*RS 510.35 Ordonnance du 2 octobre 1955 concernant les mesures à prendre par l'armée contre les épidémies et épizooties*)
https://www.fedlex.admin.ch/eli/cc/1955/863_885_893/fr

Ordinance on Domestic Disaster Management by the Army (*RS 513.75 Ordonnance du 21 novembre 2018 sur l'aide militaire en cas de catastrophe dans le pays*)
https://www.fedlex.admin.ch/eli/cc/2018/731/fr

Federal Act on War Material (*RS 514.51 Loi fédérale du 13 décembre 1996 sur le materiel de guerre*)
https://www.fedlex.admin.ch/eli/cc/1998/794_794_794/fr
Prohibits the development, production, indirect transfer, acquisition, import, export, transit and stockpiling of nuclear, biological or chemical weapons under Article 7. It prohibits any action committed by any person who has any connection to the acquisition of WMD. This article also applies to offences committed abroad if they are in violation of international law, which is binding in Switzerland.

Ordinance on War Material (*RS 514.511 Ordonnance du 25 février 1998 sur le matériel de guerre*)
https://www.fedlex.admin.ch/eli/cc/1998/808_808_808/fr
Regulates the initial authorisation and the specific authorisations that are required for the manufacture, the brokerage, the import, the export and the transit of war materials, as well as the conclusion of contracts to transfer incorporeal property, including know-how and the concession of related rights. Applies in Switzerland customs area, to Swiss customs warehouses and Swiss customs enclaves.

Federal Act on the Protection of the Population and Civil Protection (*RS 520.1 Loi fédérale du 20 décembre 2019 sur la protection de la population et sur la protection civile*)
https://www.fedlex.admin.ch/eli/cc/2020/887/fr

Ordinance on the Civil Protection (*RS 520.12 Ordonnance du 11 novembre 2020 sur la protection de la population*)
https://www.fedlex.admin.ch/eli/cc/2020/889/fr

Ordinance on the Federal Staff Civil Protection (*RS 520.17 Ordonnance du 2 mars 2018 sur l'État-major fédéral Protection de la population*)
https://www.fedlex.admin.ch/eli/cc/2018/162/fr

Federal Act on Customs (*RS 631.0 Loi du 18 mars 2005 sur les douanes*)
https://www.fedlex.admin.ch/eli/cc/2007/249/fr

Ordinance on Customs (*RS 631.01 Ordonnance du 1er novembre 2006 sur les douanes*)
https://www.fedlex.admin.ch/eli/cc/2007/250/fr

Ordinance on the Transportation of Hazardous Goods on the Road (*RS 741.621 Ordonnance du 29 novembre 2002 relative au transport des marchandises dangereuses par route*)
https://www.fedlex.admin.ch/eli/cc/2002/685/fr
Regulates the transport of dangerous materials by automobiles or other mediums of transport on roads open to those same vehicles.

Ordinance on Hazardous Goods Representatives for the Transportation of Hazardous Goods on the Road, by Air or by Sea (*RS 741.622 Ordonnance du 15 juin 2001 sur les conseillers à la sécurité pour le transport de marchandises dangereuses par route, par rail ou par voie navigable*)
https://www.fedlex.admin.ch/eli/cc/2001/268/fr
Determines the appointment, tasks, training and examination of persons charged with reducing risks to people, property and the environment during transportation of hazardous goods or packaging operations, shipment or loading and unloading associated with this transport.

Ordinance on the Transportation of Hazardous Goods by Railway and Aerial Railway (*RS 742.412 Ordonnance du 31 octobre 2012 sur le transport de marchandises dangereuses par chemin de fer et par installation à câbles*)
https://www.fedlex.admin.ch/eli/cc/2012/785/fr

Federal Act on Surveillance of Postal Mail and Telecommunications (*RS 780.1 Loi fédérale du 18 mars 2016 sur la surveillance de la correspondance par poste et télécommunication*)
https://www.fedlex.admin.ch/eli/cc/2018/31/fr

Ordinance on Surveillance of Postal Mail and Telecommunications (*RS 780.11 Ordonnance du 15 novembre 2017 sur la surveillance de la correspondance par poste et télécommunication*)
https://www.fedlex.admin.ch/eli/cc/2018/32/fr

Ordinance on the Transplantation of Organs, Tissues and Cells of Animal Origin (*RS 810.213 Ordonnance du 16 mars 2007 sur la transplantation d'organes, de tissus et de cellules d'origine animale*)
https://www.fedlex.admin.ch/eli/cc/2007/283/fr

Ordinance on Clinical Trials with Therapeutic Products (*RS 810.305 Ordonnance du 20 septembre 2013 sur les essais cliniques dans le cadre de la recherche sur l'être humain*)
https://www.fedlex.admin.ch/eli/cc/2013/643/fr

Ordinance on Pharmaceuticals (*RS 812.212.21 Ordonnance du 21 septembre 2018 sur les médicaments*)
https://www.fedlex.admin.ch/eli/cc/2018/588/fr
Regulates: a. authorization of medicines on the market ready for use, b. authorization processes of surface treatment of labile blood products, c. classification criteria for categories of delivery, d. distribution restrictions, e. authorization of mail order drugs, f. market surveillance and vigilance.

Federal Act on the Protection against Dangerous Substances and Preparations (*RS 813.1 Loi fédérale du 15 décembre 2000 sur la protection contre les substances et les préparations dangereuses*)
https://www.fedlex.admin.ch/eli/cc/2004/724/fr
Protects the lives and health of human beings from the harmful effects of substances or preparations.

Ordinance on Good Laboratory Practice (*RS 813.112.1 Ordonnance du 18 mai 2005 sur les bonnes pratiques de laboratoire*)
https://www.fedlex.admin.ch/eli/cc/2005/467/fr
Fixes the principles of good laboratory practices, guarantees the quality of studies and regulates the verification of these requirements.

Ordinance on Marketing and Handling Biocidal Products (*RS 813.12 Ordonnance du 18 mai 2005 concernant la mise sur le marché et l'utilisation des produits biocides*)
https://www.fedlex.admin.ch/eli/cc/2005/468/fr
Regulates marketing of biocidal products and their active substances, particularly the various types and licensing procedures, the use of data from previous requests for the benefit of new applicants, and the classification of packaging, labelling and safety data sheets.

Federal Act on the Protection of the Environment (*RS 814.01 Loi fédérale du 7 octobre 1983 sur la protection de l'environnement*)
https://www.fedlex.admin.ch/eli/cc/1984/1122_1122_1122/fr

Ordinance on the Protection against Major Accidents (*RS 814.012 Ordonnance du 27 février 1991 sur la protection contre les accidents majeurs*)
https://www.fedlex.admin.ch/eli/cc/1991/748_748_748/fr
Covers activities involving the contained use of genetically modified organisms and pathogenic organisms in laboratories, production facilities, greenhouses and premises housing animals.

Ordinance on Waste Management (*RS 814.600 Ordonnance du 4 décembre 2015 sur la limitation et l'élimination des déchets*)
https://www.fedlex.admin.ch/eli/cc/2015/891/fr

Federal Act on non-Human Genetic Engineering (*RS 814.91 Loi fédérale du 21 mars 2003 sur l'application du génie génétique au domaine non humain*)
https://www.fedlex.admin.ch/eli/cc/2003/705/fr
Protects humans, animals and the environment against the abuse of genetic engineering, and ensures that applications of genetic engineering serve humans, animals and the environment.

Ordinance on the Release of Organisms into the Environment (*RS 814.911 Ordonnance du 10 septembre 2008 sur l'utilisation d'organismes dans l'environnement*)
https://www.fedlex.admin.ch/eli/cc/2008/614/fr
Protects humans, animals and the environment, as well as biodiversity and sustainable use of its components against the dangers and outrages associated with the use of organisms, their metabolites and their waste.

Ordinance on the Contained Use of Organisms (*RS 814.912 Ordonnance du 9 mai 2012 sur l'utilisation des organismes en milieu confiné*)
https://www.fedlex.admin.ch/eli/cc/2012/329/fr
Protects people and the environment and in particular communities of animals and plants and their habitats, against harmful effects or nuisances of the contained use of organisms. Contributes to the maintenance of biodiversity and soil fertility. Regulates the contained use of organisms, in particular genetically modified or pathogenic organisms. The revision of the ordinance that entered into force on 1 January 2020 introduces a definition of misuse and explicitly addresses biosecurity.

Ordinance on Transborder Traffic of Genetically Modified Organisms (*RS 814.912.21 Ordonnance du 3 novembre 2004 sur les mouvements transfrontières des organismes génétiquement modifiés*)
https://www.fedlex.admin.ch/eli/cc/2004/726/fr
Regulates the transborder transport of GMOs. Does not apply to medicines for human use, which contain GMOs.

Federal Act on Foods and Commodities (*RS 817.0 Loi fédérale du 20 juin 2014 sur les denrées alimentaires et les objets usuels*)
https://www.fedlex.admin.ch/eli/cc/2017/62/fr

Ordinance on Foods and Commodities (*RS 817.02 Ordonnance du 16 décembre 2016 sur les denrées alimentaires et les objets usuels*)
https://www.fedlex.admin.ch/eli/cc/2017/63/fr

Ordinance on Maximum Levels of Pesticide Residues Present in or on Products of Vegetable or Animal Origin (*RS 817.021.23 Ordonnance du DFI du 16 décembre 2016 sur les limites maximales applicables aux résidus de pesticides présents dans ou sur les produits d'origine végétale ou animale*)
https://www.fedlex.admin.ch/eli/cc/2017/151/fr

Ordinance on Genetically Modified Foods (*RS 817.022.51 Ordonnance du DFI du 27 mai 2020 sur les denrées alimentaires génétiquement modifiées*)
https://www.fedlex.admin.ch/eli/cc/2020/456/fr

Ordinance on Hygiene when Handling Food (*RS 817.024.1 Ordonnance du DFI du 16 décembre 2016 sur l'hygiène dans les activités liées aux denrées alimentaires*)
https://www.fedlex.admin.ch/eli/cc/2017/183/fr

Ordinance on the Enforcement of the Legislation on Foods (*RS 817.042 Ordonnance du DFI du 27 mai 2020 sur l'exécution de la législation sur les denrées alimentaires*)
https://www.fedlex.admin.ch/eli/cc/2020/460/fr

Ordinance on Animal Slaughter and Meat Control (*RS 817.190 Ordonnance du 16 décembre 2016 concernant l'abattage d'animaux et le contrôle des viandes*)
https://www.fedlex.admin.ch/eli/cc/2017/66/fr

Ordinance on Animal Slaughter Hygiene (*RS 817.190.1 Ordonnance du DFI du 23 novembre 2005 concernant l'hygiène lors de l'abattage d'animaux*)
https://www.fedlex.admin.ch/eli/cc/2005/816/fr

Federal Act on the Control of Communicable Human Diseases (*RS 818.101 Loi fédérale du 28 septembre 2012 sur la lutte contre les maladies transmissibles de l'homme*)
https://www.fedlex.admin.ch/eli/cc/2015/297/fr
Regulates fight against diseases transmissible to man by stating that the Confederation and the cantons take the necessary measures, including biosafety precautions, to protect human beings against pathogens including those genetically modified. Regulates identification of laboratories through permits delivered by the Swiss Institute of Therapeutic Products. Regulates the trade in pathogenic agents and requires an authorisation from every person disseminating pathogens for research or commerce. Entitles the Federal Council to regulate the transport, importation, exportation and the transit of pathogens, to limit or to ban the use of certain pathogens, to fix the conditions for persons using pathogens. Outlines the provisions for quarantine, vaccination, and disease surveillance and reporting requirements. Provides for imprisonment or fines anyone who intentionally or by negligence does not respect the prescriptions of the Federal Act.

Ordinance on the Control of Communicable Human Diseases (*RS 818.101.1 Ordonnance du 29 avril 2015 sur la lutte contre les maladies transmissibles de l'homme*)
https://www.fedlex.admin.ch/eli/cc/2015/298/fr

Ordinance on the Declaration of Observations of Communicable Human Diseases (*RS 818.101.126 Ordonnance du DFI du 1 décembre 2015 sur la déclaration d'observations en rapport avec les maladies transmissibles de l'homme*)
https://www.fedlex.admin.ch/eli/cc/2015/892/fr

Ordinance on Microbiological Laboratories (*RS 818.101.32 Ordonnance du 29 avril 2015 sur les laboratoires de microbiologie*)
https://www.fedlex.admin.ch/eli/cc/2015/299/fr

Ordinance Relating to the Act of Labour (*RS 822.114 Ordonnance 4 du 18 août 1993 relative à la loi sur le travail*)
https://www.fedlex.admin.ch/eli/cc/1993/2564_2564_2564/fr

Ordinance on the Protection of Workforce against Microbiological Risks (*RS 832.321 Ordonnance du 25 août 1999 sur la protection des travailleurs contre les risques liés aux micro-organismes*)
https://www.fedlex.admin.ch/eli/cc/1999/445/fr
Defines micro-organisms and genetically modified micro-organisms and techniques for genetic modification. Requires the regular identification and evaluation of the risks to which workers are exposed and the notification of the "Bureau de Biotechnologie de la Confédération" by employers. Defines general security measures for the protection of the workers by employers. Covers activities involving the contained use of genetically modified organisms and pathogenic organisms in laboratories, production facilities, greenhouses and premises housing animals.

Federal Act on Agriculture (*RS 910.1 Loi fédérale du 29 avril 1998 sur l'agriculture*)
https://www.fedlex.admin.ch/eli/cc/1998/3033_3033_3033/fr

Ordinance on the Coordination of Controls on Agricultural Farms (*RS 910.15 Ordonnance du 31 octobre 2018 sur la coordination des contrôles dans les exploitations agricoles*)
https://www.fedlex.admin.ch/eli/cc/2018/673/fr

Ordinance on Primary Production (*RS 916.020 Ordonnance du 23 novembre 2005 sur la production primaire*)
https://www.fedlex.admin.ch/eli/cc/2005/752/fr

Ordinance on the Release of Phytopharmaceutical Products (*RS 916.161 Ordonnance du 12 mai 2010 sur la mise en circulation des produits phytosanitaires*)
https://www.fedlex.admin.ch/eli/cc/2010/340/fr
Ensures that plant protection products lend themselves well in their intended use and as those are used in accordance with the requirements preventing unacceptable side effects on the health of humans, animals and the environment.

Ordinance on Plant Protection (*RS 916.20 Ordonnance du 31 octobre 2018 sur la protection des végétaux contre les organisms nuisibles particulièrement dangereux*)
https://www.fedlex.admin.ch/eli/cc/2018/682/fr
Protects plants of all sorts against the nuisances of dangerous organisms, and protects agriculture and horticulture fields from the same organisms.

Ordinance on the Control of Milk (*RS 916.351.0 Ordonnance du 20 octobre 2010 sur le contrôle du lait*)
https://www.fedlex.admin.ch/eli/cc/2010/713/fr

Ordinance on the Milk Production Hygiene (*RS 916.351.021.1 Ordonnance du DFI du 23 novembre 2005 réglant l'hygiène dans la production laitière*)
https://www.fedlex.admin.ch/eli/cc/2005/824/fr

Federal Act on Animal Diseases (*RS 916.40 Loi du 1er juillet 1966 sur les épizooties*)
https://www.fedlex.admin.ch/eli/cc/1966/1565_1621_1604/fr

Ordinance on the Control of Animal Diseases (*RS 916.401 Ordonnance du 27 juin 1995 sur les épizooties*)
https://www.fedlex.admin.ch/eli/cc/1995/3716_3716_3716/fr
Designates new contagious animal diseases and defines the measures of control of and the organization of the fight against animal diseases, as well as the compensation of animal keepers.

Ordinance on the Disposal of Animal Side Products (*RS 916.441.22 Ordonnance du 25 mai 2011 concernant l'élimination des sous-produits animaux*)
https://www.fedlex.admin.ch/eli/cc/2011/372/fr
Ensures that animal by-products do not endanger human and animal health and do not harm the environment. Allows as much as possible the recovery of animal by-products. Ensures that the infrastructure for the disposal of animal by-products is available.

Ordinance on Import, Transit and Export of Animals and Animal Products Exchanged with Third Countries (*RS 916.443.10 Ordonnance du 18 novembre 2015 réglant les échanges d'importation, de transit et d'exportation d'animaux et de produits animaux avec les pays tiers*)
https://www.fedlex.admin.ch/eli/cc/2015/843/fr
Regulates the import, transit and export of animals, animal by-products and animal products.

Ordinance on Import, Transit and Export of Animals and Animal Products Exchanged with EU Member States, Iceland and Norway (*RS 916.443.11 Ordonnance du 18 novembre 2015 réglant les échanges d'importation, de transit et d'exportation d'animaux et de produits animaux avec les Etats membres de l'UE, l'Islande et la Norvège*)
https://www.fedlex.admin.ch/eli/cc/2015/846/fr
Regulates the import, transit and export of animals, animal by-products and animal products.

Federal Act on the Control of Goods Suitable for Civilian and Military Purposes and Specific Military Goods (*R. 946.202 Loi fédérale du 13 décembre 1996 sur le contrôle des biens utilisables à des fins civiles et militaires et des biens militaires spécifiques*)
https://www.fedlex.admin.ch/eli/cc/1997/1697_1697_1697/fr
Regulates, inter alia, the import, export and transit of microorganisms and toxins. Applies to dual-use goods and specific military goods, which are the subject of international agreements. Also outlines the responsibilities of the Federal Council in this regard including licensing and reporting requirements and surveillance measures for import, export, transit, production, storage, transfer and use of goods.

Ordinance on the Control of Goods Suitable for Civilian and Military Purposes, Specific Military Goods and Strategic Goods (*RS 946.202.1 Ordonnance du 3 juin 2016 sur le contrôle des biens utilisables à des fins civiles et militaires, des biens militaires spécifiques et des biens stratégiques*)
https://www.fedlex.admin.ch/eli/cc/2016/352/fr
Regulates the export, import and transit of goods usable for civilian and military purposes, specific military goods and strategic goods which are the subject of international control measures not binding pursuant to international law. Applies in Swiss customs area to Swiss customs warehouses and Swiss customs enclaves.

Ordinance on the Control of Chemicals Suitable for Civilian and Military Purposes (*RS 946.202.21 Ordonnance du 21 août 2013 sur le contrôle des produits chimiques utilisables à des fins civiles et militaires*)
https://www.fedlex.admin.ch/eli/cc/2013/580/fr

Ordinance Establishing Measures against Persons and Entities Linked to Osama bin Laden, the al-Qaeda Group or the Taliban (*RS 946.203 Ordonnance du 2 octobre 2000 instituant des mesures à l'encontre de personnes et entités liées à Oussama ben Laden, au groupe «Al-Qaïda» ou aux Taliban*)
https://www.fedlex.admin.ch/eli/cc/2000/429/fr

Federal Act on Sanctions on Trade with Foreign Countries (*RS 946.231 Loi fédérale du 22 mars 2002 sur l'application de sanctions internationales*)
https://www.fedlex.admin.ch/eli/cc/2002/564/fr

Ordinance of the Swiss Financial Market Supervisory Authority on Combatting Money Laundering and Financing of Terrorism in the Financial Sector (*RS 955.033.0 Ordonnance de l'Autorité fédérale de surveillance des marchés financiers du 3 juin 2015 sur la lutte contre le blanchiment d'argent et le financement du terrorisme dans le secteur financier*)
https://www.fedlex.admin.ch/eli/cc/2015/390/fr

Ordinance on the Reporting Bureau in Matters of Money Laundering (*RS 955.23 Ordonnance du 25 août 2004 sur le Bureau de communication en matière de blanchiment d'argent*)
https://www.fedlex.admin.ch/eli/cc/2004/626/fr

Titles in English are unofficial translations that are provided for information purposes only and have no legal force. To access legal documents please consult the Swiss Federal Legislation in either French (links above), German or Italian. Some additional information may also be obtained in the framework of UNSCR 1540 at: https://www.un.org/en/sc/1540/national-implementation/national-reports.shtml

Confidence-Building Measure "F"

Declaration of past activities in offensive and/or defensive biological research and development programmes

In the interest of increasing transparency and openness, States parties shall declare whether or not they conducted any offensive and/or defensive biological research and development programmes since 1 January 1946.

If so, States parties shall provide information on such programmes, in accordance with Form F.

Form F

Declaration of past activities in offensive and/or defensive biological research and development programmes

1. Date of entry into force of the Convention for the State Party.

Tuesday, May 4, 1976

2. Past offensive biological research and development programmes:

- no

- Period(s) of activities

N/A

- Summary of the research and development activities indicating whether work was performed concerning production, test and evaluation, weaponization, stockpiling of biological agents, the destruction programme of such agents and weapons, and other related research.

N/A

3. Past defensive biological research and development programmes:

- yes

- Period(s) of activities

1997 to present.

- Summary of the research and development activities indicating whether or not work was conducted in the following areas: prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination, and other related research, with location if possible.

Please refer to Form A, part 2 (ii) as well as past CBM declarations.

Confidence-Building Measure "G"

Declaration of vaccine production facilities

To further increase the transparency of biological research and development related to the Convention and to broaden scientific and technical knowledge as agreed in Article X, each State party will declare all facilities, both governmental and non-governmental, within its territory or under its jurisdiction or control anywhere, producing vaccines licensed by the State party for the protection of humans. Information shall be provided on Form G attached.

Form G

Declaration of vaccine production facilities

1. Name of facility:

Janssen Vaccines, Branch of Cilag International GmbH

2. Location (mailing address):

Rehhagstrasse 79, CH-3018 Bern, Switzerland

3. General description of the types of diseases covered:

1	Disease targeted	Bacteremia; Urinary Tract Infections (UTI)
	Name of vaccine	ExPEC Multivalent (Extraenous Pathogenic E.coli)
	License	Phase 3: US, CA, JP, NZ, AU, KR, NL, ES, DK, UK, TW, IL, SE, DE, CZ, IT, FR

2	Disease targeted	Ebola Virus Disease
	Name of vaccine	As26.ZEBOV
	License	EU Trial Phase: DRC, RWA

1. Name of facility:

EmergentBiosolutions Berna GmbH

2. Location (mailing address):

Oberriedstrasse 68, CH-3174 Thörishaus, Switzerland

3. General description of the types of diseases covered:

	Disease targeted	Typhoid fever
1	Name of vaccine	Vivotif, Typhoral L
	License	US, EU, CH, NO, UK, IL, CA, AU, NZ, SG, MY, KR

	Disease targeted	Cholera
2	Name of vaccine	Vaxchora
	License	US, EU

	Disease targeted	Chikungunya fever
3	Name of vaccine	No trade name yet
	License	Phase 2 and 3: US

1. Name of facility:

Lonza AG

2. Location (mailing address):

Lonzastrasse, CH-3930 Visp, Switzerland

3. General description of the types of diseases covered:

	Disease targeted	Respiratory Coronavirus infections
1	Name of vaccine	mRNA-1273 (Moderna)
	License	US, EU, CH, other countries

	Disease targeted	Invasive Pneumococcal Disease
2	Name of vaccine	VAX-24
	License	Phase 1/2: US

Notes

1. World Health Organization

2. World Organization for Animal Health.

3. The containment units which are fixed patient treatment modules, integrated with laboratories, should be identified separately.

4. For facilities with maximum containment units participating in the national biological defence research and development programme, please fill in name of facility and mark "Declared in accordance with Form A, part 2 (iii)".

5. In accordance with the latest edition of the WHO Laboratory Biosafety Manual, or equivalent.

6. Microorganisms pathogenic to humans and/or animals

7. In accordance with the latest edition of the WHO Laboratory Biosafety Manual and/or the OIE Terrestrial Manual or other equivalent internationally accepted guidelines.

8. In accordance with the latest edition of the WHO Laboratory Biosafety Manual and/or the OIE Terrestrial Manual or other equivalent internationally accepted guidelines.

9. Including viruses and prions.

10. It is understood that this may include organisms made pathogenic by molecular biology techniques, such as genetic engineering.

11. See paragraph 2 of the chapeau to Confidence-Building Measure B.

12. Including guidelines.

13. Micro-organisms pathogenic to man, animals and plants in accordance with the Convention.

14. In accordance with the latest version of the WHO Laboratory Biosafety Manual or equivalent national or international guidance.

15. In accordance with the latest version of the WHO Laboratory Biosecurity Guidance or equivalent national or international guidance.