

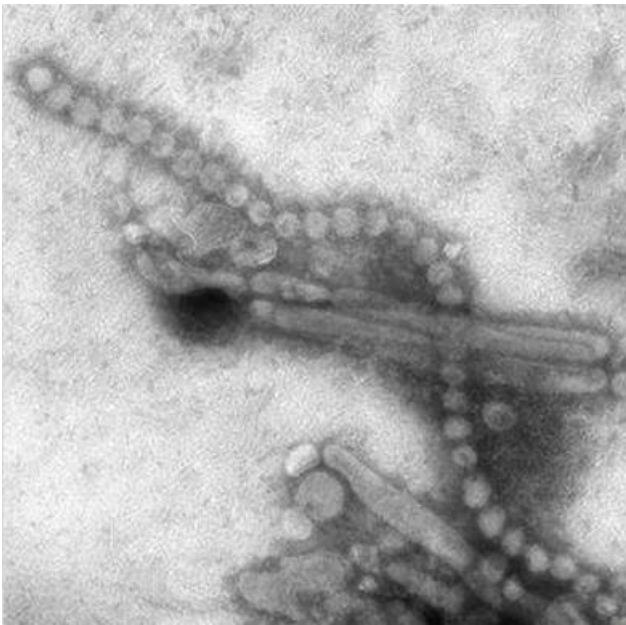
Influenza B virus

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GENERAL INFORMATION

Influenza B virus FLUBV

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Category:	Virus
Genus:	Genus influenza virus within the family of Orthomyxoviridae
Risk group:	<p>2</p> <p>Biological agents that can cause human disease and might be a hazard to employees; they are unlikely to spread to the community; there is usually effective prophylaxis or treatment available.</p>
References:	<p>Note V: Effective vaccine available. The "V" tag has been adopted from Annex III of Directive 2000/54/EC.</p>
Consultant / Reference laboratory:	<p>National Reference Centre for Influenza [Nationales Referenzzentrum für Influenza] Robert Koch Institute (RKI, Robert-Koch-Institut) Department of Infectious Diseases/FG 17 Head: Dr. Brunhilde Schweiger Seestrasse 10 13353 Berlin Germany Phone: +49 30 18754 2456 or -34 83 Fax: +49 30 18754 2699</p> <p>Robert Koch Institute (RKI, Robert-Koch-Institut) Department of Respiratory communicable diseases/FG 36 Management: PD Dr. Walter Haas Seestrasse 10 13353 Berlin Germany Phone: +49 (0)30 18754 3431 / 3328 Fax: +49 (0)30 18754 3341</p>



Transmission electron micrograph of influenza virions
<http://phil.cdc.gov/phil/home.asp>
CDC, Cynthia S. Goldsmith and Thomas Rowe, 2013.

Medical significance

Seasonal influenza is an annually occurring disease which may result in serious complications with a fatal course, particularly in elderly persons and chronically ill persons. The annually adapted vaccine offers a certain degree of protection against the disease, and can prevent complications particularly in elderly persons.

Reference: [04034](#)

OCCUPATIONAL SAFETY AND HEALTH

[Sector](#) | [Activity](#) | [Protective measures](#) | [Inactivation/Decontamination](#) |
[Immediate measures/First aid](#) | [Occupational health care](#)

SECTORS

- Healthcare
- Care of the elderly
- Laboratories

Reference: [04038 10025](#)

ACTIVITIES

- Tätigkeiten mit Enger Kontakt zu anderen Personen
- Tätigkeiten mit Kontakt zu potentiell erregerrhaltigem Material

Reference: [04038 10025](#)

PROTECTIVE MEASURES

The following protective measures apply to specific activities in laboratories, the husbandry of laboratory animals and biotechnological activities. For further information see [TRBA 100](#), [TRBA 120](#), [TRBA 500](#).



Technical measures

Where tasks intentionally involve biomaterials, their identity must be verified and documented routinely.

Areas in which the biomaterial is processed must be isolated from other areas and labelled with the 'Biohazard' warning symbol and protection level 2.

The doors of the area within which the protection level applies must open in the direction of the escape route and be equipped with an inspection window.

Where a health hazard posed by bioaerosols cannot be eliminated, the relevant activities must be performed in a microbiological safety cabinet (MSC). For detailed information on activities in MSCs, see leaflet B 011 of the BG RCI (German Social Accident Insurance Institution for the raw materials and chemical industry).

Wash basins, disinfectant dispensers, disposable towels and hand detergents must be available.

Water faucets and disinfectant dispensers must be operable without the use of the hands.

Laboratories must offer suitable eyewash facilities.

All surfaces and areas that could come into contact with biological agents must be easy to clean, liquid-tight and resistant to detergents and disinfectants. A seamless wall-floor joint must be effected.

Windows and doors must be kept closed while work is in progress.

Work areas are to be maintained in a clean and tidy state. Only tools and devices that are actually needed may remain on the benches.

Pipettors must be provided and used. Mouth pipetting is not permitted.

If the use of pointed or sharp instruments cannot be avoided, they must be disposed of in suitable containers after use.

The release of biological agents must be minimised during the opening of technical equipment.

Catch basins must be in place to ensure that open sample containers are prevented from turning over during work operations.

Clearly labelled, closed, rigid, liquid-tight and unbreakable vessels that can be disinfected from the outside must be provided and used for the in-house transport of biological agents.

Transport of biological agents outside the plant is subject to the regulations governing hazardous goods (class 6.2).

Suitable containers must be available for the collection of waste that constitutes biological agents.

Organisational measures

The number of staff must be limited to the actual requirements, and access to the area in which the protection level applies must be restricted to authorized persons.

An instruction manual must be prepared. Prior to beginning their activity and subsequently at least once a year, verbal and work-related instruction must be provided to staff members to familiarise them with the hazards and protective measures as laid down in the instruction manual. DGUV Informative Publication 213-016 (BGI/GUV-I 853) contains a prototype instruction manual on 'activities involving biological agents of Risk Group 2' in accordance with the German Ordinance on Biological Substances.

The instruction process must also include advice in occupational medicine and safety.

Restrictions of employment for expectant and nursing mothers must be observed in accordance with the German Maternity Protection Act.

Injuries must be reported immediately to the person in charge.

Personal protection - body protection

Suitable protective clothing must be worn (at least lab coats).

During the processing of infectious tissues, the protective clothing must be complemented by disposable aprons.

Remove protective clothing when leaving the area in which the protection level applies.

Keep protective clothing separate from normal clothing.

Personal protection - hand protection

Depending on the results of the risk assessment, the use of protective gloves may be mandatory for certain activities.

The skin protection plan must be observed.

Personal protection – eye and face protection

Depending on the results of the risk assessment, protective goggles or face protection may be necessary.

Personal protection - respiratory protection

Depending on the results of the risk assessment, a respiratory protection device may be necessary. Respiratory protection equipment must be worn for only a limited period of time. This period must be defined in the risk assessment.

Depending on the results of the hazard assessment, it may be necessary to wear respiratory equipment. Respiratory equipment may only be worn for a limited time. The wearing time must be specified in the hazard assessment.

Occupational hygiene

The consumption and storage of food and alcohol/tobacco in the protection level area is forbidden. The wearing of jewellery, watches and rings on the hands and the forearms is not permitted.

Fingernails are to be kept short.

Following completion of work and prior to leaving the work area, hands are to be disinfected, washed and remoisturised according to the skin protection plan.

Skin protection and skin care agents must be made available in contamination-proof containers.

Contaminated protective clothing and shoes are to be collected safely and decontaminated, cleaned and disposed of centrally.

Work clothing must not be cleaned at home.

The cleaning regulations for employees, equipment and workplaces must be defined in a hygiene plan.

Insects and pests in the working area must be regularly controlled.

Vaccination

A vaccine is available.

Reference: [00001 04034 99999](#)

INACTIVATION / DECONTAMINATION

Disinfection measures must be carried out by proven means and procedures. For detailed information see the following lists: DVG - Animal Husbandry (German Association for Veterinary Medicine, Accommodation and Husbandry of Animals), DVG - Food Area, [VAH](#) and RKI. Officially ordered disinfection measures (decontamination) required by the authorities may be carried out only with disinfection agents included in the [RKI list](#).

Furthermore, the Industrie Association Hygiene and Surface Protection ([HO](#)) supplies lists of statements of companies on the efficacy of different products. The information in this register is based on statements of the respective companies.

Disinfectants based on various active ingredients (e.g. peroxide compounds, peracetic acid, quaternary ammonium compounds, aldehydes and others) are effective against enveloped viruses, whereby care must be taken regarding temperatures at time of use and information on exposure times.

A suitable autoclave must be available in the same building.

Externally contaminated test vessels must be disinfected before opening.

Work areas and working equipment must be decontaminated before the performance of maintenance measures. For further information see [TRBA 100](#) ('Technical Rules for Biological Agents').

Contaminated solid wastes, liquid cultures and suspensions containing pathogens are to be collected in appropriate containers and deactivated.

Reference: [00001 99999](#)

IMMEDIATE MEASURES / FIRST AID / POST-EXPOSURE PROPHYLAXIS

Accidental release measures

Immediately clear contaminated work areas and await sedimentation of any aerosols which may have formed; then put on protective wear and disinfect surfaces according to the hygiene plan (note exposure times). Respiratory equipment is recommended.

Absorb larger amounts of liquids with a universal binding agent (e.g. diatomite aka kieselguhr, sand), autoclave the resulting mixture, and then dispose of it as waste. Absorb smaller quantities of liquid using a single-use towel and dispose of it with the contaminated waste.

First aid: eyes and mucous membranes

Rinse the eyes under running water or with an eye shower or ready-made rinse solution with opened lids for 10 - 15 minutes. The rinse liquid is potentially infectious and must therefore be decontaminated by autoclaving if it is collected. If rinsing of the eyes takes place under running water, drainage of the rinse water into sewage systems is generally unavoidable. However, a hazard to bodies of water is generally not a concern, due to the comparatively small quantities of microbes contained in sprays into the eye and the relatively low environmental resistance of influenza viruses. Finish by disinfecting the washbasin or sink according to the hygiene plan.

First aid: respiratory tract

Inhalation of infectious aerosols represents a definite infection risk for affected persons. Therefore, thoroughly rinse the mouth and throat with water, spit the water out, do not swallow it. Dispose of rinse water as contaminated liquid waste. Consult the accident insurance consultant or plant physician.

First aid: swallowing

Rinse the mouth thoroughly with water, spit it out, do not swallow it; dispose of rinse water as contaminated waste. Consult the accident insurance consultant or plant physician.

Reference: [99999](#)

OCCUPATIONAL HEALTH CARE according to [ArbMedVV](#)

Mandatory health care:

In the case of tasks specifically involving contact with the biological agent, a health care must be provided by the employer before commencement and then at regular intervals.

In the case of tasks involving incidental contact with the biological agent in research facilities or laboratories where regular activities which involve the possibility of coming into contact with infected or suspected samples, with infected or suspected animals, or objects or materials containing or contaminated with pathogens are carried out, the employer must provide a health care.

When finishing an activity for which mandatory health care had to be occasioned, the employer must offer optional health care.

An optional health care must also be offered if as a result of the exposure to biological agents

- a serious infectious illness is to be expected and post-exposure prophylactic measures are possible,
- or
- an infection has resulted.

MORPHOLOGY AND PHYSIOLOGY

MORPHOLOGY

There are influenza A, B and C viruses. Influenza A and B viruses are the causative agents of "seasonal flu".

Influenza B viruses have spike-like projections on their viral membranes: these spikes consist of the glycoproteins haemagglutinin (HA) or neuraminidase (NA).

Reference: [04034](#)

INFORMATION ON MOLECULAR BIOLOGY

Genome

Influenza viruses possess a segmented, negative-sense RNA genome.

There are no subtypes of influenza B viruses; however, two genetically differing lines circulate, namely the Yamagata line and the Victoria line.

Reference: 04034

OCCURRENCE / NATURAL HABITAT

FREE-LIVING / HOST BOUND

This biological agent is host-dependent parasitical.

Reference: 99999

HOSTS

Humans and marine mammals (seals).

Reference: 04034

VECTORS

Humans.

Reference: 04034

GEOGRAPHIC DISTRIBUTION

Worldwide.

Reference: 04034

PATHOGENICITY / PATHOGENIC PROPERTIES

CHARACTERISTIC OF PATHOGENICITY

Facultative human-pathogenic (it does not necessarily cause diseases in humans).

Reference: 99999

ALLERGENICITY / SENSITISING EFFECT

An allergic / sensitising potential is not known.

Reference: 99999

DISEASE

DESCRIPTION

Influenza, flu.

Reference: 99999

ZOONOSIS

Zoonosis (transmission between animals and humans): Yes

Reference: 99999

INCUBATION PERIOD

1 - 2 days.

Reference: 04034

SYMPTOMS AND COURSE OF DISEASE

Approx. one- third of influenza infections take a feverish course; another third present in the form of milder illness; and another third are asymptomatic. Symptoms may include: longer periods of fever, dry cough, shortness of breath ranging to respiratory distress, sore throat, chest pain and headache, cold bloody sputum, drowsiness, weakness, confusion, dehydration (deep yellow urine, reduced urinary excretion).

In severe courses, which mainly appear in very young, elderly or chronically ill patients, but also in women during late pregnancy, the illness worsens 2 - 5 days after onset of symptoms.

Complications may include myocarditis (inflammation of the heart muscle), encephalopathy (brain damage) and respiratory failure requiring artificial ventilation.

Children commonly develop middle ear infections.

Reference: 04034

LETHALITY

Fatal courses with viral pneumonia are less common in influenza B; however, secondary bacterial infections of the lung are more common than in influenza A.

The administration of salicylates (e.g. aspirin, ASA) is contraindicated in children with feverish diseases such as influenza, since this may cause them to develop the life-threatening Reye's syndrome accompanied by vomiting, liver swelling and brain damage.

Reference: 03031 04034

THERAPY

Antiviral treatment should be initiated as quickly as possible in patients from high-risk groups (see above) or with severe courses. However, such treatment may also have a positive impact on the prognosis even if it is instituted at a later time in the course of the illness.

Patients with mild courses should receive only symptomatic treatment.

The administration of salicylates (e.g. aspirin, ASA) to children with feverish diseases such as influenza is contraindicated since this may cause them to develop the life-threatening Reye's syndrome accompanied by vomiting, liver swelling and brain damage.

Reference: 04034

PROPHYLAXIS

Annual vaccination in October or November, or when there is a flu outbreak. The vaccine takes effect after approx. two weeks; protection may develop earlier.

The vaccine is recommended for high-risk groups - that is, persons aged over 60, chronically ill persons, pregnant women from the second trimester on or with underlying illness from the first trimester on, and persons working in the healthcare sector who are at increased risk of becoming infected or infecting persons in need of care themselves, as well as persons working in areas with high levels of public contact.

Reference: 04034

EPIDEMIOLOGY

TRANSMISSION ROUTES / PORTALS OF ENTRY

Transmission takes place via inhalation (by breathe).

Transmission takes place orally (by ingestion).

Reference: 99999

LEGAL PRINCIPLES / REGULATIONS

LAWS AND ORDINANCES

Ordinance on Safety and Health Protection at Workplaces Involving Biological Agents
(Biological Agents Ordinance - [BioStoffV](#))

Law on the prevention and control of infectious diseases in humans (Infection Protection Act -[IfSG](#))
(only in German)

Ordinance on Occupational Health Care ([ArbMedVV](#))

TECHNICAL RULES AND OTHER REGULATIONS

[TRBA 100](#)

Protective measures for activities involving biological agents in laboratories

[TRBA 250](#)

Biological agents in health care and welfare facilities

[TRBA 400](#)

Guideline for risk assessment and for the instruction of employees in relation to activities with biological agents

[TRBA 450](#)

Criteria for the classification of biological agents

[TRBA 462](#)

Classification of viruses into risk groups (only in German)

[TRBA 500](#)

Basic measures to be taken for activities involving biological agents

LINKS

Public Health Agency of Canada (PHAC)

[Information provided by the Public Health Agency of Canada for this pathogen](#)

German Federal Institute for Occupational Safety and Health (BAuA)

[Epidemiology of work-related infectious diseases \(only in German\)](#)

Further Links:

[National Research Platform for Zoonoses - Pathogen profile influenza viruses](#)

REFERENCES

[General information](#) | [Occupational and health protection](#) | [Morphology and physiology](#) | [Occurrence/natural habitat](#) | [Pathogenicity/pathogenic properties](#) | [Disease](#) | [Epidemiology](#) | [Legal basics](#) | [Links](#) | [References](#)

Quelle: 00001

Informationen aus den Technischen Regeln für Biologische Arbeitsstoffe, insbesondere aus:
Information from the technical rules for biological substances, in particular from:

- [TRBA 100](#)

Schutzmaßnahmen für Tätigkeiten mit biologischen Arbeitsstoffen in Laboratorien; Ausgabe:
Oktober 2013, geändert 2014

Protective measures for activities involving biological agents in laboratories; Edition: October 2013,
amended 2014

- [TRBA 120](#)

Versuchstierhaltung; Ausgabe: Juli 2012, geändert 2017

Experimental animal husbandry; Edition July 2012, amended 2017

- [TRBA 500](#)

Grundlegende Maßnahmen bei Tätigkeiten mit biologischen Arbeitsstoffen; Ausgabe: April 2012

Basic measures to be taken for activities involving biological agents; Edition April 2012

Quelle: 01462

[TRBA 462](#)

Einstufung von Viren in Risikogruppen; Ausgabe: April 2012

Classification of viruses in risk groups; Edition April 2012

Quelle: 02014

Verordnung zur arbeitsmedizinischen Vorsorge ([ArbMedVV](#))

Ordinance on Occupational Health Care ([ArbMedVV](#))

Quelle: 03031

Modrow, S., Falke, D., Truyen, U., Schätzl, H.: "Molekulare Virologie" , 3. Auflage 2010

Quelle: 04034

Robert-Koch-Institut: „Ratgeber für Ärzte - Influenza (Saisonale Influenza, Influenza A(H1N1) 2009, Aviäre Influenza)“, 2013

Quelle: 04038

Deutsche Gesetzliche Unfallversicherung, Bundesverband: „Information: Handlungsanleitung für die arbeitsmedizinische Vorsorge nach dem Berufsgenossenschaftlichen Grundsatz G 42 „Tätigkeiten mit Infektionsgefährdung“, 2010

Quelle: 10025

Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (Hrsg.): Forschung Projekt F 5198/A91 (I. Fischer, St. Schurer, R. Jäckel, M. A. Rieger) Epidemiologie arbeitsbedingter Infektions-krankheiten (2013). www.baua.de/de/Publikationen/Fachbeitraege/F5198.html

Quelle: 99999

Angabe des Bearbeiters

Indication of the author

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