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#### Approval process 审批过程

	Name 姓名	Title 职务	Signature 签名	Date 日期
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Reviewed by 审阅人	Yigal Cohen; Shaogang Chen 陈少刚; Sehoon Park;	PVC & General Director; PVC assistant & Safety coordinator; Academy Safety Representative;		
Approved by 批准人		Campus Safety Committee;		

#### Reversion records 版本历史记录

Rev. No. 版本号	Publication date 出版日期	Rev. reason/ content modified 再版原因/更改内容
01	2020-02-10	New file 新建文件
02	2022-06-01	Regularly updated with no major changes. 定期更新，无重大变更内容。
03	2025-12-01	Regular renew 周期审阅更新

#### Relevant departments (select relevant departments with a "v") 相关部门 (用V勾选相关部门)

Construction Dept. 校园建设部	v	Operation Dept. 校园运营部	v	H.R. Dept. 人力资源部	v
RIGS 研究创新和研究 生部	v	U.G. Dept. 本科教学部	v	I.T.Dept. 电脑信息部	v


#### Relevant documents 相关文件

No 无

发放方式 (涂黑)

电子版 ☒

纸版 ☐

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## 1 Purpose 目的

Standardize biological experimental safety management, maintain normal lab safety management to prevent incidents, and avoid or reduce the harm of biological infections or potentially infectious biological factors to lab users, the environment and the public.

规范实验生物安全管理，维护正常的检验工作秩序，防止意外事故的发生，避免或减少实验室内感染或潜在感染性生物因子对实验室工作人员、环境和公众造成危害。

## 2 Scope of application 适用范围

Suitable for all biological safety incidents happen in biological labs.

适用于学校生物实验室所有生物安全事故。


## 3 Responsibility 职责

### 3.1 EHS Manager EHS 管理人员

- Assist biological labs to establish biosafety incident handling instructions;  
协助生物实验室建立生物安全事故处理程序；
- Assisting biological labs in conducting corresponding biosafety incident handling training.  
协助生物实验室进行相应的生物安全事故处理培训工作。

### 3.2 Lab Manager 实验室负责人：

- Responsible for the biosafety incident handling and related rectification work;  
负责本实验室生物安全事故处理及相关整改工作；
- Responsible for the emergency response resources and equipment for biological incident handling  
负责本实验室生物安全事故处理的资源和设备设施；
- Responsible for the emergency training of biological incident handling.  
负责本实验室生物安全事故处理程序的教育与培训。

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### 3.3 Lab Tutors: 实验室人员:

- Familiar with the handling requirements for biological incidents;  
熟悉及掌握生物安全事故的处理要求;
- Support and organize biological incident drilling and practice.  
积极参与生物安全事故应急演练;

## 4 Biological incident Emergency Instruction 生物安全事故应急处理指引

### 4.1 Stabbed, cut or bruised by a sharp object with pathogenic bacteria

被带致病菌的利器刺伤、切割伤或擦伤

Injured persons should take off their lab cloth, wash hands and injured parts, use appropriate skin disinfectant, and medical treatment if necessary.

受伤人员应当脱下防护服，清洗双手和受伤部位，使用适当的皮肤消毒剂，必要时进行医学处理。

Record the injury cause and related micro-organisms and keep a detailed medical record.

记录受伤原因和相关的微生物，并应保留完整适当的医疗记录。

### 4.2 Ingestion of potentially infectious substances 潜在感染性物质的食入


The victim's Lab cloth should be taken off and medically treated. Report the identification of ingested materials and the details of the incident, and keep detailed medical records.

应脱下受害人的防护服并进行医学处理。要报告食入材料的鉴定和事故发生的细节，并保留完整适当的医疗记录。

### 4.3 Release of potentially hazardous aerosols (outside the biosafety cabinet)

潜在危害性气溶胶的释放（在生物安全柜以外）

All personnel must immediately evacuate the relevant hazardous area and any exposed personnel should receive medical advice. The person in charge of the lab and the person in charge of the bioengineering discipline should be notified immediately.

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所有人员必须立即撤离相关危险区域，任何暴露人员都应接受医学咨询。应当立即通知实验室负责人和生物工程学科负责人。

In order to allow aerosol discharge and sedimentation of larger particles, it is strictly forbidden for personnel to enter within a certain period of time (for example, within 1 h).

If the laboratory has a central ventilation system, it should be deferred to the lab until the air testing the lab is safe for entry (eg 24h). A "No Entry" sign should be posted.

为了使气溶胶排出和使较大的粒子沉降，在一定时间内（例如 1h 内）严禁人员入内。如果实验室设有中央通风系统，则应推迟进入实验室值实验室检查符合进入条件后（例如 24h）。应张贴“禁止进入”的标志。

After the corresponding time, under the guidance of the person in charge of biosafety, wear appropriate protective cloth and respiratory protection equipment to remove pollution.

过了相应时间后，在生物安全负责人的指导下，穿戴适当的防护服和呼吸保护装备进行清除污染。

#### 4.4 Container breakage and spillage of infectious materials 容器破碎及感染性物质的溢出


Immediately cover the broken material contaminated with infectious materials or infected with spilled cloth with a cloth or paper towel, then pour the disinfectant on it and allow it to act for an appropriate period of time.

应当立即用布或纸巾覆盖受感染性物质污染或受感染性物质溢洒的破碎物品，然后上面倒上消毒剂，并使其作用适当时间。

Then cloth, paper towels and broken items are cleaned up; glass fragments are cleaned with tweezers. Wipe the contaminated area with disinfectant.

随后将布、纸巾以及破碎物品清理掉；玻璃碎片应用镊子清理；再用消毒剂擦拭污染区域。If you use dustpan to clean up the broken material, they should be sterilized or cleaned with effective disinfectant.

如果用簸箕清理破碎物，应当对他们进行灭菌或放在有效的消毒液内浸泡。

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Cloth, paper towels and rags for cleaning should be placed in designated containers containing contaminated waste.

用于清理的布、纸巾和抹布等应当放在指定盛放污染性废弃物的容器内。

Wear gloves during all these operations.

在所有这些操作过程中都应戴手套。

If the test form or other printed or handwritten material is contaminated, copy the information and place the original in a container containing contaminated waste.

如果实验表格或其他打印或手写材料被污染，应将这些信息复制，并将原件置于盛放污染性废弃物的容器内。

#### 4.5 The centrifuge tube containing potentially infectious substances in the centrifuge without the closable centrifuge barrel is broken

未装可封闭离心桶的离心机内盛有潜在感染性物质的离心管发生破裂

If the vessel is rupturing or suspected to be rupturing while machine running, turn off the machine and keep the machine sealing (for example, 30 minutes) to aerosol deposition.

如果机器正在运行时，发生容器破裂或怀疑发生破裂，应关闭机器电源，让机器密闭（例如 30min）使气溶胶沉积。

After stopping and opening the machine cover and find the vessel is broken, turn off the machine and allow the machine to seal (for example, 30 minutes) to aerosol deposition.


如果机器停止后发现破裂，应立即将盖子盖上，并密闭（例如 30min）。

The biological lab manager must be notified immediately when these above-mentioned cases occur.

发生这两种情况时都应立即通知生物实验室负责人。

Wear sturdy gloves (such as thick rubber gloves) for all operations and wear appropriate disposable gloves when necessary. When cleaning glass shards, use tweezers or cotton with tweezers.

所有操作都应佩戴结实的手套（如厚橡胶手套），必要时可在外面戴适当的一次性手套。当清理玻璃碎片时应当使用镊子，或用镊子夹着的棉花来进行。

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All broken centrifuge tubes, glass fragments, buckets, cross shafts and rotors should be placed in a non-corrosive disinfectant known to have killing activity against related microorganisms.

所有破碎的离心管、玻璃碎片、离心桶、十字轴和转子都应放在无腐蚀性的、已知对相关微生物具有杀灭活性的消毒剂内。

Unbroken centrifuge tubes with lids should be placed in another container with disinfectant and then recycled.

未破损的带盖离心管应放在另一个有消毒剂的容器中，然后回收。

Wipe the inner cavity of the centrifuge with the appropriate concentration of the same disinfectant and wipe again, then rinse with water and dry. All materials used in cleaning should be treated as infectious waste.

离心机内腔应用适当浓度的同种消毒剂擦拭，并再次擦拭，然后用水冲洗并干燥。清理时所使用的全部材料都应按感染性废弃物处理。

#### 4.6 The centrifuge tube ruptures in a closable bucket (safety cup)

在可封闭的离心桶（安全杯）内离心管发生破裂

All sealed buckets should be handled in the biosafety cabinet.

所有密封离心桶都应在生物安全柜内装卸。

If any suspect damage in the safety cup, you should loosen the safety cup cover and autoclave the barrel.

如果怀疑在安全杯内发生破损，应该松开安全杯盖子并将离心桶高压灭菌。


Another way is that the safety cup can be chemically disinfected.

另一种方法是，安全杯可以采用化学消毒。

#### 4.7 Fires and natural disasters involving biosafety 涉及生物安全的火灾和自然灾害

The emergency responders should be informed in advance which rooms have potentially infectious substances.

应事先告知应急救援人员哪些房间有潜在的感染性物质。

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The person in charge of the biological lab arranges emergency response team members to visit the biological lab according to the annual emergency drilling plan, and to be familiar with the layout and equipment of the laboratory.

生物实验室负责人根据年度演习计划安排应急救援人员参观生物实验室，熟悉实验室的布局和设备。

In the event of a natural disaster, a warning should be issued to the local emergency rescue center regarding the potential hazards of buildings in or near the laboratory building.

发生自然灾害时，应就实验室建筑内或附近建筑物的潜在危险向当地应急救援中心发提出警告。

#### 4.8 Biological Waste Handling 废物处理

Access to these potential biofouling areas is only possible with the assistance of trained laboratory staff.

只有在受过训练的实验室工作人员的陪同下，才能进入这些潜在生物污染区域。


Infectious substances should be collected in leak-proof boxes or strong disposable bags. The wastes should be temporarily stored according to the temporary storage requirements of school waste, and then disposed of by the biological waste disposal company with professional processing capacity.

感染性物质应收集在防漏的盒子内或结实的一次性袋子中，废弃物根据学校废弃物暂存要求进行暂存，随后交由具备专业处理能力的生物废弃物处理公司进行处理。

### 5 Emergency Response: contact person 紧急救助：联系对象

The following phone numbers and addresses should be prominently posted in the facility (including but not limited to):

在设施内应显著张贴以下电话号码及地址（包括但不限于）：

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- (1) Lab managers and tutors  
实验室负责人及管理人员
- (2) Emergency Response Team  
校内应急响应小组
- (3) Hospital/First aid team/medical staff (medical staff on campus/near hospital)  
医院/急救机构/医务人员（校内医务人员/就近急救医院）

## 6 Emergency Response Equipment 急救装备

The following emergency equipment must be equipped:

必须配备以下紧急装备：


- First aid kits, including common and special antidote for lab pathogens  
急救箱，包括针对实验室病原菌常用的和特殊的解毒剂
- Suitable fire extinguishers and fire blankets  
合适的灭火器和灭火毯
- Adsorbent materials and waste packaging  
吸附材料和废弃物包装物

The following equipment is recommended, but can vary depending on the situation:

建议配备以下设备，但可根据具体情况有所不同：

- Protective cloth (Class C protective clothing at least, gloves and headgear – for use in microbiological incidents involving a level of risk below Biological Safety Level 3)  
C 级防护服（C 级连体防护服、手套和头套——用于涉及危险度低于 3 级的微生物事故）
- Facial shield with a canister that protects against chemicals and particles  
带有能有效防护化学物质和颗粒的滤毒罐的全面罩式防毒面具



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- Room disinfection equipment such as sprayers and formaldehyde fumigators  
房间消毒设备，如喷雾器和甲醛熏蒸器
- Stretcher  
担架
- Warning barricade and belt that divide the boundaries of hazardous areas.  
划分危险区域界限的器材和警告标示。

## 7 References 参考资料

World Health Organization 《Laboratory Biosafety Manual》 (Third Edition 2004)

世界卫生组织《实验室生物安全手册》（第三版 2004 年）