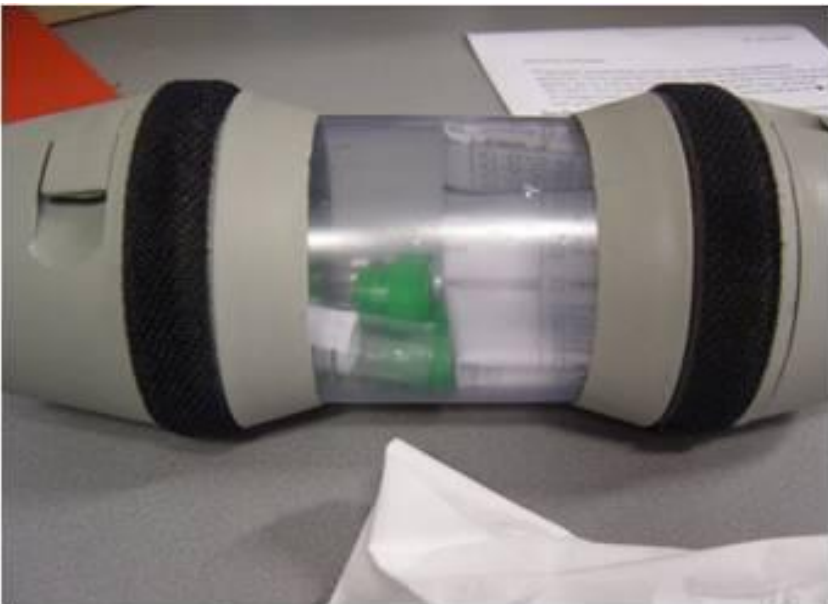




# Πιστοποιήσεις Ειδικών Βιοασφάλειας

## Διονύσης Βούρτσης

Τεχνολόγος Ιατρικών Εργαστηρίων, ASCP LMU, IFBA PC  
Υπεύθυνος Σχεδιασμού & Επικοινωνίας IFBA  
Μέλος Διοικητικού Συμβουλίου EBSA  
Γενικός Γραμματέας Ελληνικής Εταιρείας Βιοασφάλειας





00:00:04

00:00:17







**IFBA** International Federation of  
Biosafety Associations

[www.internationalbiosafety.org](http://www.internationalbiosafety.org)



# Strengthening Global Health Security: The Role of Professional Biosafety Organizations



# Ρόλος Επιστημονικών Εταιριών

---

- Δικτύωση και Συνεργασία
- Προώθηση πρακτικών και διαδικασιών διαχείρισης βιολογικών κινδύνων
- Πιστοποίηση ικανοτήτων επαγγελματιών βιοασφάλειας για τον ασφαλή και υπεύθυνο χειρισμό υλικών και παραγόντων

# APBA Collaborating Partners

A-PBA is evolving and will continue to stay relevant serving the Asia-Pacific Region and be an active partner of the international biosafety community at the same time.



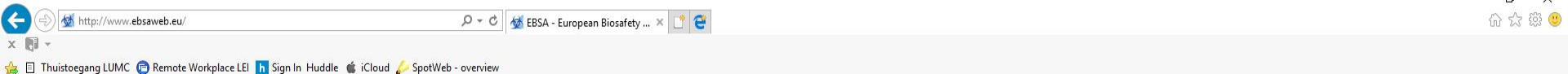
**APBA**  
Asia Pacific  
Biosafety Association







# EBSA - European Biosafety Association



BBP Events Member section

- ABOUT EBSA
- BECOME A MEMBER
- UPCOMING EVENTS
- LAST EBSA CONFERENCE
- CONTACT



Madrid, Spain, 25-28 April 2017

Thank you Madrid!

Save the date April 17th - 20th Copenhagen, Denmark.



### Corporate members

Check out our corporate members directory.

Corporate members



### Conference 2015 - impresson

The EBSA conference is interactive courses, lectures, exhibition, posters and networking with your peers.



## OUR MISSION: Enhancing knowledge and understanding of biological safety

### Become a member

Become a part of the European biosafety community and get involved.

Become a member

Member benefits

### Login as member

Information tailored to your profile, available as of July 13th.

### Keep your profile up to date

Login and keep your profile up to date, available as of July 13th.

### About EBSA

We aim to provide a forum for its members to discuss and debate issues of concern and to represent those working in the field of biosafety and associated activities.

More info

# www.ebsaweb.eu



# EBSA - European Biosafety Association

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- Μη κερδοσκοπικός οργανισμός, ανοιχτός σε όποιον εργάζεται ή έχει σχέση με την Βιοασφάλεια
- Ιδρύθηκε το 1996
- Μέλη: Διάφοροι κλάδοι επαγγελματιών:
  - Υγειονομική περίθαλψη, ακαδημαϊκή κοινότητα, Έκτακτες ανάγκες, φαρμακευτική / βιοτεχνολογική Βιομηχανία, Κανονιστικές - Ρυθμιστικές υποθέσεις
- Εκπροσωπεί την κοινότητα της Βιοασφάλειας στην Ευρώπη





Participant Grants  
available

22ND ANNUAL CONFERENCE OF  
THE EUROPEAN BIOSAFETY ASSOCIATION

**Burning topics in Biosafety**

# **Bucharest - Romania**

*EBSA Courses April 2 - 3, 2019*

*EBSA Conference April 4 - 5, 2019*

[www.ebsaweb.eu/bucharest](http://www.ebsaweb.eu/bucharest)





**ABSA**  
INTERNATIONAL  
*The Association for Biosafety and Biosecurity*



Membership [Join/Renew >](#)

ABSA International (ABSA) was founded in 1984 to promote biosafety as a scientific discipline and serve the growing needs of biosafety professionals throughout the world. Its goals are to provide a professional association that represents the interests and needs of practitioners of biological safety, and to provide a forum for the continued and timely exchange of biosafety information. [\(Learn more\)](#)

### News



#### Basic Biosafety On-demand Module

Basic Biosafety is an on-demand module designed to provide guidance on the basic principles and practices of biological safety for biosafety professionals, biosafety officers, and other professionals involved in workplace safety in laboratories and facilities throughout the world.

### Online Resources

**RISK  
GROUP  
DATABASE**

### Mark Your Calendar!



Principles & Practices  
of Biosafety  
February 18, 2018 -  
February 23, 2018

### ABSA International Blog



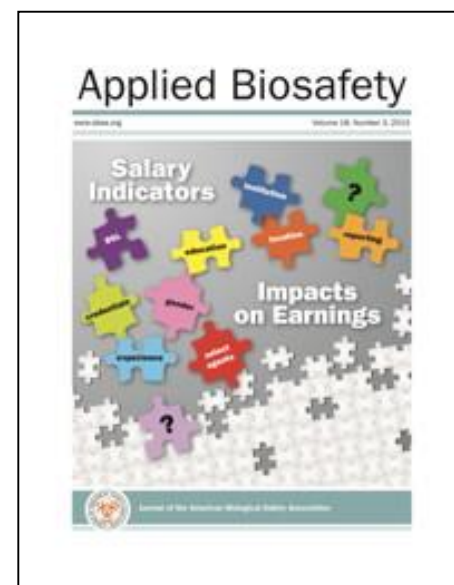
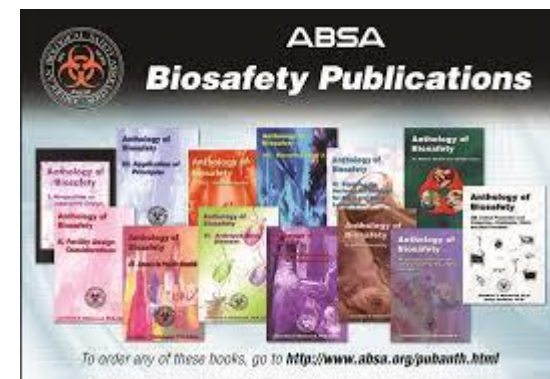
Human Salmonella  
Typhimurium  
Infections Linked to  
Exposure to Clinical  
and Teaching  
Microbiology

[www.absa.org](http://www.absa.org)



# ABSA

- Ιδρύθηκε το 1984
- Σκοπός:
  - Να προωθήσει τη βιοασφάλεια ως επιστημονικό κλάδο
  - Να δώσει λύσεις στις αυξανόμενες ανάγκες των επαγγελματιών βιοασφάλειας σε όλο τον κόσμο
  - Φόρουμ για τη συνεχή και έγκαιρη ανταλλαγή πληροφοριών για τη βιοασφάλεια







Tweets 52   Following 385   Followers 162   Lists 0   Moments 0

Edit profile

**Biosafety IFBA**

@BiosafetyIFBA

The International Federation of Biosafety Associations (IFBA) is not-for-profit non-governmental organization of regional and national Biosafety Associations.



**Imtiaz Ali**

@Imtiazbrep   Follows you

Follow



**Jib Chalee**

@CKchalee   Follows you

Follow



**evans ngetich**

@evansngetich15   Follows you

Follow

[www.internationalbiosafety.org](http://www.internationalbiosafety.org)





**IFBA** International Federation of  
Biosafety Associations

[www.internationalbiosafety.org](http://www.internationalbiosafety.org)

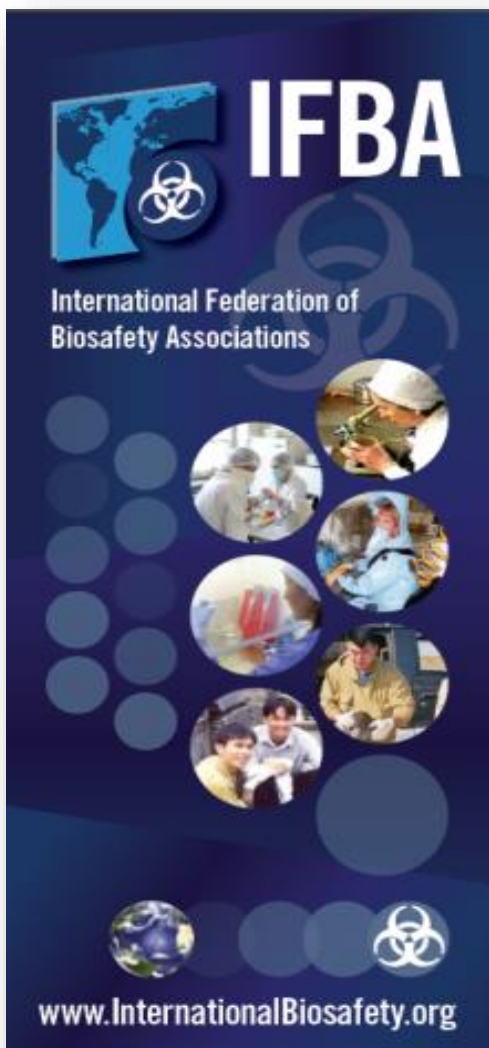


# **Biosafety and Global Public Health**



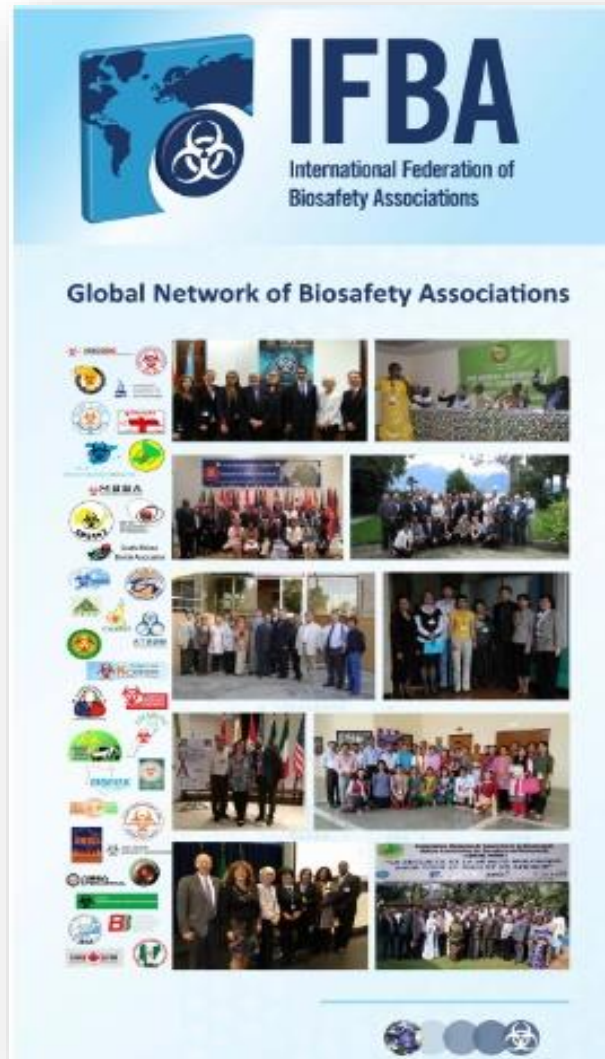
# IFBA

- Διεθνής μη κερδοσκοπικός Οργανισμός
  - Ιδρύθηκε το 2001
- "Ασφαλής & Υπεύθυνη Εργασία με Βιολογικά Υλικά"*





# IFBA



- Η IFBA έχει μέλη 40 περιφερειακές και εθνικές Ενώσεις Βιοασφάλειας
- Επίσης, υπάρχουν και μέλη Παρατηρητές (Κυβερνήσεις, Πανεπιστήμια, Διεθνείς Οργανισμοί)





Member organizations



Observer organizations





# Διεθνής Βιοασφάλεια

Η IFBA παρέχει βοήθεια για την υλοποίηση των βασικών σημείων υλοποίησης του IHR (International Health Regulations) για την Βιοασφάλεια

International Health Regulations  
(2005)

IHR CORE CAPACITY  
MONITORING FRAMEWORK:

QUESTIONNAIRE FOR MONITORING  
PROGRESS IN THE  
IMPLEMENTATION OF IHR CORE  
CAPACITIES IN STATES PARTIES

2015 Questionnaire

Component	8.2	Laboratory biosafety and biosecurity
Indicator	8.2.1	*Laboratory biosafety and laboratory biosecurity (Biorisk management <sup>71</sup> ) practices in place and implemented

- 8.2.1.1 Are biosafety guidelines accessible to laboratories?
- 8.2.1.2 Are regulations, policies or strategies<sup>72</sup> for laboratory biosafety available?
- 8.2.1.3 Has a responsible entity<sup>73</sup> been designated for laboratory biosafety and laboratory biosecurity?
- 8.2.1.4 Are relevant staff trained in laboratory biosafety and laboratory biosecurity guidelines?
- 8.2.1.5 Has an institution or person<sup>74</sup> responsible for inspection, (could include certification of biosafety equipment) of laboratories for compliance with biosafety requirements been identified?
- 8.2.1.6 Has a biorisk<sup>75</sup> assessment been conducted in laboratories to guide and update biosafety regulations, procedures and practice, including for decontamination and management of infectious waste?



# Διεθνής Βιοασφάλεια

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## Η IFBA είναι μέλος:

- Global Health Security Action Group (Μη Κυβερνητικής Ομάδας Δράσης για την Ασφάλεια της Παγκόσμιας Υγείας)
- JEE Alliance (Joint External Evaluation)
- Παγκόσμιας πρωτοβουλίας συνεργασίας: Stop TB Partnership





# Πιστοποίηση Βιοασφάλειας

- WHO Joint External Evaluation Tool (Εργαλείο Εξωτερικής Αξιολόγησης)
  - Action Package Prevent 3 – Biosafety & Biosecurity



## Documentation or Evidence for Level of Capability:

- Documentation of dangerous pathogen collections housed in the country
- Establishment, enactment and enforcement of any relevant national legislation on biosafety & biosecurity
- Biosafety officers certified and stationed at all laboratories that have the potential to handle dangerous
- Policy document for biorisk or biosafety management in a facility is a written policy statement that is s
- Membership in good standing of a regional or international biosafety association
- OIE Country PVS report (also included for Prevent 2- Zoonoses)
- OIE Country PVS Gap Analysis report (also included for Prevent 2- Zoonoses)
- OIE Country PVS Laboratory Mission Report



# Πρόγραμμα Πιστοποίησης IFBA

- Προηγουμένως δεν υπήρχε ανεξάρτητος, διεθνώς τυποποιημένος μηχανισμός για την αξιολόγηση και την επικύρωση των Γνώσεων, Δεξιοτήτων και Ικανοτήτων ενός επαγγελματία στη διαχείριση της Βιοασφάλειας
- 2010 - Η IFBA δημιούργησε σε συνεργασία με μέλη της και άλλους εταίρους ένα νέο πρόγραμμα πιστοποίησης για την Βιοασφάλεια



**IFBA**



**Certified  
Professional**





# Πρόγραμμα Πιστοποίησης IFBA

- Το πρόγραμμα IFBA αναπτύχθηκε σε εναρμόνιση με το πρότυπο ISO 17024
- 100 ερωτήσεις πολλαπλής επιλογής - 2 ώρες
- Οι εξετάσεις προσφέρονται Online ή τοπικά με επιτήρηση από εγκεκριμένους επιτηρητές της IFBA, στα συνέδρια μελών της για τη Βιοασφάλεια και σε άλλες εκδηλώσεις





# Διαχείριση Βιολογικής Ασφάλειας

- Η απόκτηση της πιστοποίησης Διαχείριση Βιολογικής Ασφάλειας αποτελεί προϋπόθεση για όλες τις άλλες πιστοποιήσεις

## Exam Blueprint

### Professional Certification in Biorisk Management

Passing Score – 74%

Domain	Number of Questions
A) Fundamentals of Biorisk Management Systems	18
B) CWA 15793 Laboratory Biorisk Management	16
C) Implementing a Biorisk Management System	42
D) Biorisk Management Roles & Responsibilities	24



# Biosecurity

---

**Exam Blueprint**  
**Professional Certification in Biosecurity**  
**Passing Score – 73%**

<b>Domain</b>	<b>Number of Questions</b>
A) Biosecurity Conventions, Guidelines and Standards	30
B) Biosecurity Risk Assessment & Program Management	23
C) Physical Biosecurity Measures	13
D) Pathogen Accountability	8
E) Personnel Reliability	14
F) Dual-Use & Bioethics	12





# Διαχείριση βιολογικών αποβλήτων

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## Exam Blueprint

### Professional Certification in Biological Waste Management

Passing Score – 72%

Domain	Number of Questions
A) Types and Risks of Biological Waste	27
B) Biological Waste Management	35
C) Treatment & Disposal of Biological Waste	21
D) Chemical Disinfection and Sterilants	11
E) Validation & Efficacy Monitoring	6



## Σχεδιασμός, λειτουργία και συντήρηση Εγκαταστάσεων

---

<b>Exam Blueprint</b> <b>Professional Certification in Biocontainment Facility Design, Operations &amp; Maintenance</b> <b>Passing Score – 71%</b>	
<b>Domain</b>	<b>Number of Questions</b>
A) Biocontainment Guidelines & Standards	15
B) Programming, Planning, Design & Construction	44
C) Commissioning, Validation & Certification	20
D) Facility Operations & Maintenance	21



# Επιλογή, εγκατάσταση και ασφαλής χρήση Θαλάμων Βιολογικής ασφάλειας

## Exam Blueprint

### Professional Certification in Biosafety Cabinet Selection, Installation & Safe Use

Passing Score – 70%

Domain	Number of Questions
A) Biosafety Cabinet Guidelines & Standards	13
B) Types, Proper Selection and Placement of Biosafety Cabinets	43
C) Safe Use and Maintenance of Biological Safety Cabinets	29
D) Certification of Biosafety Cabinets	15





# Πρόγραμμα Πιστοποίησης IFBA

- Χρησιμοποίηση της ονομασίας "IFBA Professional Certification"  
- IFBA PC
- Ισχύει για περίοδο 5 ετών

## International Federation of Biosafety Associations



*The Certification Body certifies that*

**Dionysis Vourtsis**


*has successfully demonstrated competence for*

**Professional Certification in Biorisk Management**

ID Number: NNN918859

Date: August 26, 2016  
*(valid for a period of 5 years)*



  
T. Bruce Anderson  
Chairman of the Certification Body



■ Countries with IFBA Certified Professionals in Biorisk Management  
*Current as of September 30, 2017*



## Directory of Certified Individuals, 22/09/2017

Details Category: Directory of Certified Individuals Published: 20 December 2015 Hits: 7651

The IFBA publishes a global directory of individuals who are Professionally Certified by the IFBA's Certification Body. If you are unable to locate an individual in this directory, this does not necessarily mean that the individual is not certified as new certificants are continually added to the list. Please contact the IFBA Secretariat at [secretariat@internationalbiosafety.org](mailto:secretariat@internationalbiosafety.org) to verify an individual's certification status.

**Directory of Certified Individuals, Updated: 22/09/2017**

### Professional Certification in Biorisk Management

1. Aamer Ikram, Pakistan
2. Abderrahmen Selmania, Algeria
3. Abdoulaye Hassana, Mali
4. Abdulaziz Zorgani, Libya
5. Abeer Elsayed Abdelaziz Mohamed, Egypt
6. Abigail Padua, Philippines
7. Abiodun Denkyo, Nigeria
8. Abraham Van Rensburg, South Africa
9. Absalom Mai, Papua New Guinea
10. Adam Ben Nasr, Tunisia
11. Adriana Miyagi, Argentina
12. Adriano Muñoz Martínez, Spain
13. Ahlam ElSayed Gamal EIDin Younes, Egypt
14. Ahmad Razi Mohamed Yunus, Malaysia
15. Alastair Reid, United Kingdom
16. Albert Bunyasi, Kenya
17. Alejandra Contreras M., Mexico
18. Alie H Wurie, Sierra Leone

# Skills of the future (big 7)

- Mental Elasticity and Complex Problem Solving
- Critical Thinking
- Creativity
- People Skills
- STEM
- SMAC (Social, Mobile, Analytics, Cloud)
- Interdisciplinary Knowledge



United Nations  
Educational, Scientific and  
Cultural Organization



• UNESCO Chair in  
• Entrepreneurship Education,  
• J.J. Strossmayer University in Osijek, Croatia



Ελληνική Εταιρία Βιοασφάλειας





# Κουλτούρα Βιοασφάλειας

- Ευαισθητοποίηση και δημιουργία συνείδησης για τους κινδύνους

➤ Αναφορά  
αποδοί

- Να αναδειχ
- για την προ
- Κατάλληλη
- Βέλτιστες Ε
- Κατάλληλα
- Εκπαίδευσ
- Υπεύθυνος



ρίς να

ι απαραίτητη

τηρίου

# ΒΙΒΛΙΟΓΡΑΦΙΑ

## **The Biological Weapons Convention:**

[https://www.unog.ch/80256EE600585943/\(httpPages\)/04FBBDD6315AC720C1257180004B1B2F?OpenDocument](https://www.unog.ch/80256EE600585943/(httpPages)/04FBBDD6315AC720C1257180004B1B2F?OpenDocument)

## **IHR, International Health Regulations, WHO:**

[http://www.who.int/topics/international\\_health\\_regulations/en/](http://www.who.int/topics/international_health_regulations/en/)

**UN Security Council Resolution 1540:** <https://www.un.org/en/sc/1540/>

**GHSA, Global Health Security Agenda:** <https://www.ghsagenda.org/>

**ABSA:** <https://absa.org/>

**EBSA:** <https://ebsaweb.eu/>

**Laboratory Biorisk Management Standard: CEN Workshop Agreement 15793:**

[https://ebsaweb.eu/sites/default/files/cwa\\_15793\\_english.pdf](https://ebsaweb.eu/sites/default/files/cwa_15793_english.pdf)

**IFBA:** [www.internationalbiosafety.org](http://www.internationalbiosafety.org)

**Global Health Security Action Group:** <http://www.ghsi.ca/english/index.asp>

**JEE Alliance:** <https://www.jeealliance.org/>

**GLI, Global Laboratory Initiative:** <http://www.stoptb.org/wg/gli/>

**HBS:** [www.hellenicbiosafety.org](http://www.hellenicbiosafety.org)

**Advancing Global Health Security, WHO:**

[http://www.who.int/ihr/publications/WHO\\_HSE\\_GCR\\_2016\\_15/en/](http://www.who.int/ihr/publications/WHO_HSE_GCR_2016_15/en/)

**Joint external evaluation tool: International Health Regulations (2005), WHO:**

[http://apps.who.int/iris/bitstream/handle/10665/204368/9789241510172\\_eng.pdf?sequence=1](http://apps.who.int/iris/bitstream/handle/10665/204368/9789241510172_eng.pdf?sequence=1)



**Καμιά κρατική αρχή δεν μπορεί να τα καταφέρει μόνη της.**

**Μόνο μέσω μόνιμης και ουσιαστικής συνεργασίας με τις Επιστημονικές Εταιρίες και Συλλόγους Βιοασφάλειας, μπορεί να υπάρξει πρόληψη και προετοιμασία για την αντιμετώπιση των βιολογικών κινδύνων και των επικίνδυνων βιολογικών περιστατικών**



# SAFETY RESPONSIBILITY



*Σας Ευχαριστώ!*

DEPENDS ON EVERYONE

# SAFETY RESPONSIBILITY



DEPENDS ON EVERYONE



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 1

- The primary objective of a biorisk management system is to
- train employees in the safe handling of biological agents.
  - protect employees, the community and environment from biological agents that are handled within the facility.
  - identify and assess risks from biological agents that are handled within the facility.
  - implement policies and practices to prevent the release of biological agents from the facility into the environment.



# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 1

- The primary objective of a biorisk management system is to
- train employees in the safe handling of biological agents.
  - protect employees, the community and environment from biological agents that are handled within the facility.
  - identify and assess risks from biological agents that are handled within the facility.
  - implement policies and practices to prevent the release of biological agents from the facility into the environment.





# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 2

What is MOST essential to the overall effectiveness of an organization's biorisk management system?

- a. Full implementation of every element
- b. Flawless execution of the system
- c. Direction from all levels of management
- d. Employee participation



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 2

What is MOST essential to the overall effectiveness of an organization's biorisk management system?

- a. Full implementation of every element
- b. Flawless execution of the system
- c. Direction from all levels of management
- d. Employee participation



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 3

What is the first consideration in the hierarchy of risk management controls?

- a. Substitution of the hazard with an alternative organism/activity
- b. Isolation of the hazard through the use of engineering controls
- c. Isolation of personnel through the use of protective equipment
- d. Elimination of the work producing the hazard



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 3

What is the first consideration in the hierarchy of risk management controls?

- a. Substitution of the hazard with an alternative organism/activity
- b. Isolation of the hazard through the use of engineering controls
- c. Isolation of personnel through the use of protective equipment
- d. Elimination of the work producing the hazard





# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 4

What does the acronym AMP stand for in biorisk management?

- a. Application, mitigation, program
- b. Assessment, mitigation, performance
- c. Assessment, methods, performance
- d. Agreement, methods, practice



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 4

What does the acronym AMP stand for in biorisk management?

- a. Application, mitigation, program
- b. **Assessment, mitigation, performance**
- c. Assessment, methods, performance
- d. Agreement, methods, practice



# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 5

Biorisk is defined as the

- a. combination of the likelihood and consequences of an adverse event involving a biological agent.
- b. accidental release or loss, theft, misuse, diversion, unauthorized access or intentional release of a biological agent.
- c. containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release.
- d. process of evaluating the risk arising from a biological agents.



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 5

Biorisk is defined as the

- a. combination of the likelihood and consequences of an adverse event involving a biological agent.
- b. accidental release or loss, theft, misuse, diversion, unauthorized access or intentional release of a biological agent.
- c. containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release.
- d. process of evaluating the risk arising from a biological agents.



# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 6

Management systems are frameworks that often integrate procedures built around the concepts of PDCA. PDCA stands for

- a. Plan, Decontaminate, Control, Assess
- b. Plan, Do, Check, Act
- c. People, Documents, Controls, Actions
- d. Plan, Document, Check, Audit





# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 6

Management systems are frameworks that often integrate procedures built around the concepts of PDCA. PDCA stands for

- a. Plan, Decontaminate, Control, Assess
- b. Plan, Do, Check, Act
- c. People, Documents, Controls, Actions
- d. Plan, Document, Check, Audit



# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 7

Where any requirement of CWA 15793 is in conflict with local regulations, the

- a. requirements of CWA 15793 are given priority.
- b. local regulations are given priority.
- c. independent third-party mediator should decide which requirements are given priority.
- d. organization should decide which requirements are given priority.



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 7

Where any requirement of CWA 15793 is in conflict with local regulations, the

- a. requirements of CWA 15793 are given priority.
- b. local regulations are given priority.
- c. independent third-party mediator should decide which requirements are given priority.
- d. organization should decide which requirements are given priority.



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 8

In the framework of the CWA 15793, laboratory biosecurity is intended to

- a. protect agricultural resources and food supplies from contamination with unwanted biological agents.
- b. prevent the loss, theft, misuse, or diversion of biological agents.
- c. screen personnel to identify those who are vulnerable to threats and physical attacks.
- d. minimize security breaches in laboratories.



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 8

In the framework of the CWA 15793, laboratory biosecurity is intended to

- a. protect agricultural resources and food supplies from contamination with unwanted biological agents.
- b. prevent the loss, theft, misuse, or diversion of biological agents.
- c. screen personnel to identify those who are vulnerable to threats and physical attacks.
- d. minimize security breaches in laboratories.





# Sample Questions - IFBA Biorisk Management Exams

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## Sample Question 9

What combination of control measures would provide the BEST option for facilities working with a blood borne transmitted biological agent?

- a. HEPA filtration of the exhaust air and using sharps containers
- b. HEPA filtration of the supply air and wearing gloves
- c. Using sharps containers and wearing gloves
- d. Sealing bench tops and using sharps containers



## Sample Questions - IFBA Biorisk Management Exams

---

### Sample Question 9

What combination of control measures would provide the BEST option for facilities working with a blood borne transmitted biological agent?

- a. HEPA filtration of the exhaust air and using sharps containers
- b. HEPA filtration of the supply air and wearing gloves
- c. Using sharps containers and wearing gloves
- d. Sealing bench tops and using sharps containers



## Sample Questions - IFBA Biorisk Management Exams

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### Sample Question 10

What combination of control measures would provide the BEST protection for an employee handling a biological agent transmitted by the ingestion route?

- a. Wearing gloves, disinfecting bench tops, and washing hands
- b. Working in a biological safety cabinet, disinfecting bench tops, and washing hands
- c. Wearing a respirator, washing hands, and disinfecting bench tops
- d. Wearing gloves, working in a biological safety cabinet, and washing hands



# Sample Questions - IFBA Biorisk Management Exams

---

## Sample Question 10

What combination of control measures would provide the BEST protection for an employee handling a biological agent transmitted by the ingestion route?

- a. Wearing gloves, disinfecting bench tops, and washing hands
- b. Working in a biological safety cabinet, disinfecting bench tops, and washing hands
- c. Wearing a respirator, washing hands, and disinfecting bench tops
- d. Wearing gloves, working in a biological safety cabinet, and washing hands