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DEGLI STUDI
DI URBINO
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Allegato 1 al Verbale n.7

SELEZIONE PUBBLICA, PER ESAMI, FINALIZZATA ALL'ASSUNZIONE CON CONTRATTO DI LAVORO SUBORDINATO A TEMPO INDETERMINATO E PIENO DI **N. 1 POSTO DI CATEGORIA C – AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI** PRESSO IL **DIPARTIMENTO DI SCIENZE BIOMOLECOLARI** DELL'UNIVERSITÀ DEGLI STUDI DI URBINO CARLO BO, **PRIORITARIAMENTE RISERVATA ALLE CATEGORIE DI PERSONALE DI CUI AGLI ARTT. 1014 E 678 DEL D.LGS. N. 66/2010**. **(COD. 23PTA05_Ig_Micro) (D.D.G. n. 239 del 17 maggio 2023)**.

Comunicazione ai sensi dell'art. 19 del D. Lgs n. 33/2013 e s.m.i.

La Commissione giudicatrice, nominata con D.D.G. n. 333 del 29 giugno 2023, risulta così composta:

- Prof. Giorgio BRANDI	- Professore Ordinario Igiene Generale e Applicata – MED/42 Università degli Studi di Urbino Carlo Bo Presidente;
- Dott. Mauro DE SANTI	- Ricercatore RTD lett. b) Igiene Generale e Applicata – MED/42 Università degli Studi di Urbino Carlo Bo Componente;
- Dott.ssa Anna CASABIANCA	- Ricercatrice RTD lett. b) Microbiologia e Microbiologia Clinica – MED/07 Università degli Studi di Urbino Carlo Bo Componente;
- Dott.ssa Laura FEDUZI	- Categoria C – Area Amministrativa Università degli Studi di Urbino Carlo Bo Segretaria.

La commissione comunica le tracce delle prove scritte e delle prove orali predisposte.

Tracce prove scritte:

PROVA 1
Il/la candidato/a descriva le principali tipologie di colture cellulari, le modalità di allestimento e applicazioni.

PROVA 2
Il/la candidato/a descriva le modalità per lavorare in sicurezza nel laboratorio con rischio biologico.

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PROVA 3 (prova estratta)

Il/la candidato/a descriva le principali procedure di sterilizzazione e disinfezione in laboratorio e gestione dei rifiuti a rischio infettivo.

Tracce prove orale:

PROVA 1

QUESITO 1

Il/La candidato/a descriva le principali tipologie di colture cellulari

QUESITO 2

Il/La candidato/a descriva le tecniche di identificazione microbiche

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a inserisca le seguenti cifre in un foglio Excel e calcoli media e deviazione standard
59; 89; 25; 63; 23; 14; 48; 35; 46; 43

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Viruses replicate only within living cells, thus many early studies of viruses were done in bacteria or plants. Tobacco mosaic virus (TMV) was an early “model virus” as it replicates in a variety of plants, at levels sufficient for biochemical analysis and imaging. Growing TMV is as simple as applying virus to abraded leaves of a susceptible plant. The earliest studies of animal viruses were limited to using whole animals. When possible animal pathogens were adapted to small animals such as mice, rats, and rabbits. These small animal models provided a means to study viral pathogenesis and vaccine efficacy. Fertile chicken and duck eggs were, and continue to be, widely used for propagating viruses. In the 1940s and 1950s development of robust cell culture techniques revolutionized the study of animal viruses. Today, most animal viruses are grown in cultured cells
Viruses. 2017: 37–52. Published online 2017 Sep 1. doi: 10.1016/B978-0-12-803109-4.00004-0 PMCID: PMC7149989

PROVA 2

QUESITO 1

Il/La candidato/a descriva le procedure di coltivazione di colture cellulari eucariotiche in vitro

QUESITO 2

Il/La candidato/a illustri nell’ambito di un laboratorio di Igiene e microbiologia, a cosa può servire la reazione di PCR.

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ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a inserisca le seguenti cifre in un foglio Excel e calcoli mediana e deviazione standard:
12; 11; 42; 24; 47; 21; 31; 84; 3; 18

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Hepatitis E virus (HEV) is a virus of Hepeviridae family and is one of the most common cause of acute viral hepatitis worldwide. So far, 8 different genotypes of HEV have been discovered and, of these, HEV-1, -2, -3 and -4 play a major role in human pathology. HEV was previously considered only as a waterborne agent, with oro-faecal transmission and large diffusion in low-income settings with poor hygienic standards. However, in the last decade HEV-3 and HEV-4 have been increasingly recognized as cause of zoonotic hepatitis in high-income countries including Europe, where at least two million of locally acquired HEV infections every year have been estimated.
Le Infezioni in Medicina, n. 1, 70-78, 2023 doi: 10.53854/liim-3101-10

PROVA 3

QUESITO 1

Il/La candidato/a descriva le principali tecniche di allestimento di colture microbiche

QUESITO 2

Il/La candidato/a illustri le cappe biohazard nel laboratorio di Igiene e microbiologia

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a effettui un grafico a linee in Excel con le seguenti cifre:
2; 5; 8; 15; 23; 45; 59; 89; 105; 156

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Bacterial infection is among the top ten most common causes of death worldwide [2]. Microbial flora in clinical specimens obtained from different parts of the human body includes a variety of different organisms both pathogenic and non-pathogenic. Traditionally, diagnosis of bacterial or fungal infections relied solely on culture based techniques and culture has been considered the gold standard of pathogen detection. However, some organisms may not be easily detectable by conventional culture methods used in most laboratories due to many factors. In a conventional clinical microbiology laboratory setting, microbial culture of most specimens will be carried out under aerobic conditions. Clinical specimens are not routinely investigated for a variety of pathogens e.g. fungi, anaerobes or rickettsial pathogens unless specifically requested or indicated by the clinical history. Standard culture techniques rely largely on morphological and biochemical characterisation for identification, which can lead to decreased specificity.

Abayasekara LM, et al. Detection of bacterial pathogens from clinical specimens using conventional microbial culture and 16S metagenomics: a comparative study. BMC Infect Dis. 2017 Sep 19;17(1):631. doi: 10.1186/s12879-017-2727-8. PMID: 28927397; PMCID: PMC5606128.

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PROVA 4

QUESITO 1

Il/La candidato/a illustri i laboratori di biosicurezza

QUESITO 2

Il/La candidato/a descriva I terreni di coltura selettivi e differenziali in microbiologia

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a effettui un grafico a istogrammi in Excel con le seguenti cifre:

52; 56; 25; 5; 12; 4; 29; 84; 89

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Chlamydia trachomatis is the most common sexually transmitted bacterial infection worldwide, with the highest prevalence in sexually active young women. Since most chlamydial infections are asymptomatic, facilitating the transmission of the pathogen in the population, regular screening is recommended for at-risk sexually active individuals. Hence, a sensitive, specific, inexpensive diagnostic test that can be executed efficiently and quickly to yield results would be helpful. In this study, we evaluated the performance (sensitivity and specificity) of the Chlamydia Rapid Test Device, an inexpensive rapid test based on immunochromatographic analysis.

Angela Serafini1 ET AL Le Infezioni in Medicina, n. 4, 562-567, 2021

PROVA 5 (prova non estratta)

QUESITO 1

Il/La candidato/a illustri il microscopio ottico, i tipi e le applicazioni

QUESITO 2

Il/La candidato/a descriva le tecniche di semina e titolazione dei microrganismi

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a effettui la somma e la media delle seguenti cifre in Excel
3; 5; 45; 2; 16; 25; 2; 59; 42; 28

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Tuberculosis, caused by *Mycobacterium tuberculosis* complex (MTBC), is now the leading cause of morbidity and mortality from an infectious disease worldwide, with an estimated 10.4 million new cases and

1.3million deaths in 2016(WHO, 2017). China has the third largest burden of tuberculosis in the world, accounting for 8.6% of global tuberculosis incidence (WHO, 2017). Although China has achieved great progress in TB control by the implementation of effective TB control strategy, the low detection rate of bacteria-positive TB cases poses a new challenge that hampers efforts at tuberculosis control [1]. According to the analysis of nationwide data, only 30% of the reported TB patients had positive laboratory evidence in this country, which is significantly lower than the global average rate of 50% (WHO, 2017).

Jin Shi, eta al BioMed Research International Volume 2018, Article ID 1514381, 5 pages https://doi.org/10.1155/2018/1514381

PROVA 6

QUESITO 1

Il/La candidato/a descriva la preparazione dei terreni di coltura in microbiologia

QUESITO 2

La reazione di PCR consta di 3 step, quali sono? Il/La candidato/a li descriva brevemente

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a effettui un grafico a torta in Excel con le seguenti cifre:
52; 84; 56; 5; 89; 12; 4; 25; 29

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

The use of bacterial indicator organisms to signal the possible presence of human pathogens in drinking water began more than a century ago in the United States, at a time when contamination of drinking and source waters by entericbacterial pathogens, such as the typhoid bacillus, was a major public health threat. In subsequent decades, the use of bacterial indicators, predominantly coliforms, has been expanded to U.S. ambient, recreational, and shellfish waters and continues to focus on identification of fecal contamination, principally of human origin. Although these approaches have been extremely effective in reducing outbreaks of waterborne human disease, significant numbers of such outbreaks are still reported annually, many of unknown etiologic origin, and it is generally agreed that a substantial number of occurrences of waterborne human disease go unrecognized or unreported.
National Research Council. 2004. Indicators for Waterborne Pathogens. Washington, DC: The National Academies Press. https://doi.org/10.17226/11010.

PROVA 7

QUESITO 1

Il/La candidato/a illustri le principali tecniche di colorazioni batteriche

QUESITO 2

Il/La candidato/a descriva la tecnica di western blotting e suo utilizzo.

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ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a inserisca le seguenti cifre in un foglio Excel e calcoli media e deviazione standard
3; 5; 45; 2; 16; 25; 2; 59; 42; 28

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Fungal infections (mycoses) affect over a billion people per year. Approximately, two million of these infections are life-threatening, especially for patients with a compromised immune system. Fungi of the genera Aspergillus, Candida, Histoplasma and Cryptococcus are opportunistic pathogens that contribute to a substantial number of mycoses. To optimize the diagnosis and treatment of mycoses, we need to understand the complex fungal-host interplay during pathogenesis, the fungal attributes causing virulence and how the host resists infection via immunological defenses. In vitro models can be used to mimic fungal infections of various tissues and organs and the corresponding immune responses at near-physiological conditions. Furthermore, models can include fungal interactions with the host-microbiota to mimic the in vivo situation on skin and mucosal surfaces. This article reviews currently used in vitro models of fungal infections ranging from cell monolayers to microfluidic 3D organ-on-chip (OOC) platforms.

Antonia Last, Michelle Maurer, Alexander S Mosig, Mark S Gresnigt, Bernhard Hube. In vitro infection models to study fungal-host interactions. FEMS Microbiol Rev 2021;45(5):fuab005. doi: 10.1093/femsre/fuab005.

PROVA 8

QUESITO 1

Il/La candidato/a descriva la tipizzazione dei microrganismi

QUESITO 2

Il/La candidato/a illustri l'allestimento di una reazione di PCR e descriva brevemente la procedura

ACCERTAMENTO COMPETENZE INFORMATICHE

Il/La candidato/a effettui la somma e la media delle seguenti cifre in Excel:
2; 5; 8; 15; 23; 45; 59; 89; 105; 156

ACCERTAMENTO LINGUA INGLESE

Read the text aloud and then comment on it

Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer death in both men and women in the US. The American Cancer Society estimates that 136,830 people will be diagnosed with colorectal cancer and 50,310 people will die from the disease in 2014. The majority of these cancers and deaths could be prevented by applying existing knowledge about cancer prevention, increasing the use of recommended screening tests, and ensuring that all patients receive timely, standard treatment. In the past decade, there has been unprecedented progress in reducing colorectal cancer incidence and death rates in the US, largely due to the prevention and early detection of colorectal cancer through screening. However, in 2010 only 59% of people age 50 or older, for whom screening is recommended, reported having received colorectal cancer testing consistent with current guidelines.
American Cancer Society. Colorectal Cancer Facts & Figures 2014-2016. Atlanta: American Cancer Society, 2014.

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Urbino, 14 luglio 2023

LA COMMISSIONE GIUDICATRICE

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- F.to Dott. Mauro DE SANTI (Componente)

- F.to Dott.ssa Anna CASABIANCA (Componente)

- F.to Dott.ssa Laura FEDUZI (Segretaria)