



SELEZIONE PUBBLICA N. 2024N2, PER TITOLI ED ESAMI, PER L'ASSUNZIONE A TEMPO INDETERMINATO E PIENO DI N. 1 PERSONA DI CATEGORIA D, POSIZIONE ECONOMICA D1, AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, PRESSO L'UNIVERSITÀ DEGLI STUDI DI PADOVA. TECNICO DI LABORATORIO DI MICROBIOLOGIA.

QUESITI COLLOQUIO

ELENCO 1

- 1) Quali sono le procedure per la coltivazione in vitro dei batteri?
- 2) Quali tecniche si possono utilizzare per identificare un virus in un campione in solo qualche ora?
- 3) Quale programma del pacchetto Office permette di preparare una presentazione?
- 4) Pathogenic viruses spread through body fluids and excretions. For instance, human immunodeficiency virus 1 is mainly transmitted via semen, severe acute respiratory syndrome coronavirus 2 via aerosols, Ebola virus via various body fluids, and Zika virus and dengue virus via blood-feeding mosquito vectors. For effective transmission, the virus must be shed into the relevant body fluid and encounter target cells at the exposure site. Additionally, viruses must evade innate defense mechanisms and effectively interact with cellular receptors for entry and replication.

ELENCO 2

- 1) Con quali tecniche si può studiare l'espressione di proteine virali in una coltura cellulare infettata?
- 2) Quali approcci si possono utilizzare per l'identificazione di un batterio?
- 3) Quale programma del pacchetto Office permette di analizzare dei dati sperimentali?
- 4) An emerging concept enabling infection and immune evasion of several enveloped (and some naked) viruses is viral apoptotic mimicry. Here, viruses benefit from the conserved mechanism where phosphatidylserine (PS) receptors serve as sensors for cells undergoing apoptosis. Apoptotic cells display PS, which is recognized by broadly expressed PS receptors of the T-cell immunoglobulin and mucin and Tyro-3, Axl, Mer families, resulting in engulfment and anti-inflammatory clearance by surrounding cells. Apoptotic mimicry viruses hijack this immunosuppressive uptake mechanism by exposing PS on the virion, which allows PS-receptor engagement and triggers endocytosis, followed by fusion. Nat Microbiol 9, 905–921 (2024).

ELENCO 3

- 1) Qual è la principale colorazione usata in batteriologia e che informazione fornisce?
- 2) Quali sono le vie di trasmissione dei microrganismi?
- 3) Quale programma del pacchetto Office permette di preparare una relazione scritta?
- 4) By employing apoptotic mimicry, viruses such as dengue, Zika, Chikungunya, Ebola or Lassa virus may infect a broad spectrum of cell types. Despite their broad cell tropism and presence in semen, saliva, human milk, urine and/or blood, transmission via oral or sexual routes is notably limited. For example, ZIKV RNA and

infectious virions have been detected in semen, breast milk and saliva. However, sexual transmissions are extremely rare, breastfeeding transmissions have only been suspected in isolated cases, and there are no reports of oral virus transmission. Nat Microbiol 9, 905–921 (2024).

ELENCO 4

- 1) Come funziona la real-time PCR e che vantaggi ha?
- 2) Come si eseguono i test per la valutazione della resistenza batterica ai farmaci?
- 3) Come posso generare un file in formato pdf?
- 4) We recently reported that semen and saliva contain extracellular vesicles (EVs) that competitively block ZIKV binding to target cells and inhibit infection in vitro and ex vivo. Reaching up to 10^{10-13} particles ml^{-1} , EVs are highly abundant in body fluids, especially in semen and saliva. However, the underlying mechanism, antiviral spectrum and presence of such EVs in other body fluids remained elusive. There is a substantial overlap in the biogenesis, morphology and cellular attachment mechanism of EVs and viruses. Nat Microbiol 9, 905–921 (2024).

ELENCO 5

- 1) Principi del Western blot e possibili applicazioni.
- 2) Come si può fare la conta delle cellule di una coltura cellulare batterica od eucariotica?
- 3) Che strategia si può impiegare per condividere/spedire un file di grandi dimensioni?
- 4) Extracellular vesicles (EVs) are lipid membrane-enveloped particles released from any cell that carry information in the form of lipids, proteins and nucleic acids. EVs can be transferred or signal to other cells to fulfil various functions including the regulation of immune responses. Notably, PS is enriched in EV membranes and, similar to viral apoptotic mimicry, EVs can engage cells via PS-mediated attachment and uptake, without inducing inflammatory responses. Nat Microbiol 9, 905–921 (2024).

ELENCO 6

- 1) Quali sono le principali metodologie di disinfezione/sterilizzazione utilizzate quotidianamente in laboratorio?
- 2) Quali sono di solito le caratteristiche dei plasmidi batterici?
- 3) Riportare un esempio di un programma che consente di generare delle immagini
- 4) Natural environments are under increasing pressure from multiple anthropogenic stressors, and freshwater systems are no exception. Freshwater environments are increasingly exposed to toxic chemical pollutants at local to global scales, raising substantial concerns for ecosystem health. Understanding the effects of chemical pollutants on natural systems is therefore key to understanding ecosystem health. A particularly important aspect is to understand how chemical pollutants affect the microbes embedded within ecosystems. Nat Microbiol 9, 938–948 (2024).

ELENCO 7

- 1) Come si possono coltivare in vitro le cellule eucariotiche?
- 2) Qual è il principio di funzionamento del test ELISA?
- 3) Nella preparazione di un testo con il programma word, cosa devo fare affinché il testo sia distribuito in maniera tale da riempire tutto lo spazio dall'inizio alla fine della riga senza che vi siano rientri irregolari nel lato destro?
- 4) Our understanding of how microbes respond to micropollutants, such as pesticides, is almost wholly based on single-species responses to individual chemicals. However, in natural environments, microbes experience multiple pollutants simultaneously. Here we perform a matrix of multi-stressor experiments by assaying the growth of model and non-model strains of bacteria in all 255 combinations of 8 chemical stressors (antibiotics, herbicides, fungicides and pesticides). We found that bacterial strains responded in different ways to stressor mixtures, which could not be predicted simply from their phylogenetic relatedness. Nat Microbiol 9, 938–948 (2024).