Allegato n. 1 al Verbale 6

Busta 1

1. Descrivi il principio della PCR, indicando le varie fasi del processo e spiegando il ruolo dei primer.
2. Tecniche spettrofotometriche o di centrifugazione per lo studio di biomolecole
3. Spiega come una scorretta manutenzione degli strumenti può alterare i risultati sperimentali
4. Informatica: illustrare i vari tipi di grafici e a che tipo di dati si applicano meglio nell'ambito del programma Excel di Microsoft
5. Inglese:

We learned that phospholipids are the principal building blocks of biomembranes. The most common phospholipids in membranes are the phosphoglycerides, but as we will see in this chapter, there are multiple types of phospholipids. All phospholipids are amphipathic molecules that consist of two segments with very different chemical properties: a fatty acid-based (fatty acyl) hydrocarbon "tail" that is hydrophobic ("water fearing") and partitions away from water, and a polar "head group" that is strongly hydrophilic ("water loving") and tends to interact with water molecules. The interactions of phospholipids with one another and with water largely determine the structure of biomembranes.

Busta 2

1. Descrivi il principio della quantitative PCR di trascritti, indicando le varie fasi del processo e spiegando come avviene la quantificazione.
2. Elettroforesi di proteine con applicazioni
3. Cosa deve contenere un registro di laboratorio correttamente compilato?
4. Informatica: Quali sono le principali funzioni di Microsoft Teams e di Google Meet?
5. Inglese:

"A centrifuge speeds sedimentation by subjecting particles in suspension to centrifugal forces as great as 1 million times the force of gravity, g, which can sediment particles as small as 10 kDa. Modern ultracentrifuges achieve these forces by reaching speeds of 150,000 revolutions per minute (rpm) or greater. However, small particles with masses of 5 kDa or less will not sediment uniformly even at such remarkably high rotation rates. The extraordinary technical achievements of modern ultracentrifuges can be appreciated by considering that they can rotate a several-pound rotor (about the size of an American football) that holds the samples in tubes at rates as high as 2500 revolutions per second!"

Busta 3

1. Principi generali di cromatografia, discussione della cromatografia a scambio ionico e sue applicazioni.
2. Elettroforesi di acidi nucleici con applicazioni
3. Descrivi anche due esempi di attività di controllo qualità interno
4. Informatica: che cos'è un database?
5. Inglese:

Comparisons of the total chromosomal DNA per cell in various species first suggested that much of the DNA in certain organisms does not encode functional RNA or have any apparent regulatory function. For example, yeasts, fruit flies, chickens, and humans have successively more DNA in their haploid chromosome sets (12.5, 180, 1300, and 3300 Mb, respectively), in keeping with what we perceive to be the increasing complexity of these organisms. Yet the vertebrates with the greatest amount of DNA per cell are amphibians, which are surely less complex than humans in their structure and behavior. Even more surprising, the unicellular protozoan Amoeba dubia has 200 times more DNA per cell than humans. Many plant species also have considerably more DNA per cell than humans have; tulips, for example, have 10 times as much DNA per cell as humans.

Busta 4

1. Principi generali di cromatografia, discussione della cromatografia di affinità e sue applicazioni.
2. Sequenziamento di acidi nucleici: metodi e applicazioni
3. Indica le principali operazioni di manutenzione ordinaria per pipette, centrifughe e spettrofotometri
4. Informatica: Illustrare le principali opzioni di formattazione di un documento
5. Inglese:

As noted above, when it comes to the architecture of proteins,"form follows function." Thus it is essential that a polypeptide be synthesized with the proper amino acid sequence, and that it fold into the proper three-dimensional conformation, with the appropriate secondary, tertiary, and possibly quaternary structure, if it is to fulfill its biological role within or outside cells. How is a protein with a proper sequence generated? A polypeptide chain is synthesized by a complex process called translation, which occurs in the cytoplasm on a large protein-nucleic acid complex called a ribosome. During translation, a sequence of messenger RNA (mRNA) serves as a template for the assembly of a corresponding amino acid sequence. The mRNA is initially generated by a process called transcription, whereby a nucleotide sequence in DNA is converted, by transcriptional machinery in the nucleus, into a sequence of mRNA.