Chocolate agar and pneumacult media

Science, Biology

Microorganisms can be grown in an artificial environment, such as a laboratory. The small organisms need nutrients to survive, this is provided to them by the culture media. This essay will focus on chocolate agar and pneumacult media.

Chocolate agar is a type of enrichment media which is used to grow the fastidious respiratory Moraxella catarrhalis (M. cat) bacterium. The bacterium can be used in the laboratory infect epithelial lung cells to see its effects in diseases such as COPD (chronic obstructive pulmonary disease). The agar contains partially digested blood cells (from a horse). Heat treatment of the agar to 56 degrees Celsius causes lysis to occur giving it a color not dislike that of chocolate and hence the name. The lysis of the blood cells releases crucial nutrients that the M. cat bacterium would otherwise not be able to access. For example, nicotinamide adenine dinucleotide (NAD) is released. This is an essential compound in the redox (reduction and oxidation) reactions that occur during respiration. Furthermore, M. cat is a gamma-haemolytic diplococcus so the agar remains a brown color (it does not carry out haemolysis on the blood cells). This attribute can be used to easily identify if there is contamination in the culture, for example if beta-haemolysis is visible it can be due to the presence of Streptococcus pneumonia.

In contrast pneumacult media is most beneficial when it is used for viral culture. Viruses are obligate parasites and as a consequence need to a host to replicate. Human air-liquid interface (ALI) cells act as the host and are inoculated with Human Rhinovirus. Successful inoculation of the cells can be determined by running an immunoassay, such as an ELISA or an MSD, on the

cell supernatants. Moreover, when the viral culture is treated with different conditions serological tests can be carried out to gain a better understanding of how a HRV causes disease. This is very crucial in the research and development of new drugs that combat HRV. ALI cells require nutrients for growth, not unlike bacteria, and this is provided to them by the pneumacult media. Pneumacult media is a specialized media containing various growth hormones and supplements allowing the cells to grow. Additionally, it contains fungizone (amphotericin), streptomycin and penicillin, which prevents contamination in the media by fungal and bacterial growth. However, this media needs to be used straightaway after adding all the supplements to the basal medium and expires after two weeks. Conversely, chocolate agar can be stored at four degrees Celsius for several months.

In conclusion, there are various types of culture media, which are specifically chosen to grow certain microorganisms in an artificial environment. Nevertheless, the main function of these media is to supply nutrients to cells so that they can grow. Media must be regularly changed to prevent the accumulation of toxins.