

Using the WISHEES website to support student writing in STEM Subjects in the EAP classroom

Sample: Medicine, Second Year, Short Answer Question Writing



Context: As part of their exams students on a medical degree (MBBS) at Barts and the London School of Medicine and Dentistry have to do a series of papers that test their understanding of specific topics within medical specialisms, such as Locomotor, Histology and Metabolism. Short answer questions (SAQs) are a common type of exam paper and one of the main forms of assessment in the first two years of an MBBS. The questions are often framed by a short case history or contextualising statement, which would often have been covered earlier through problem based learning sessions in the course. Specific training and resources have been developed which aim to make students aware of the types of questions and responses that may be required, how to write concisely under time pressure and communicate their understanding effectively. Part of this training involves marking and reviewing previous students' answers to a particular SAQ, which are then discussed with a tutor from the School of Medicine and Dentistry. In this instance, the area of medicine being examined is metabolism, specifically, biochemical metabolism.

Question: Explain the significance of lactic acid with respect to energy metabolism during exercise. (2 marks)

Text 1: Lactic acid could be converted back into pyruvate in sufficient oxygen. Lactate builds up in insufficient oxygen when pyruvate could not be converted into acetyl CoA with the emission of CO₂.

Text 2: During exercise there may be an insufficient oxygen supply to the skeletal muscles (due to vigorous contractions). Therefore, glucose can be converted to pyruvate via glycolysis but it cannot be oxidised to acetyl-CoA. Due to the lack of oxygen, the pyruvate dehydrogenase complex is blocked and so lactate dehydrogenase converts pyruvate to lactic acid. This oxidises NADH to NAD⁺ which can be used in glycolysis.

Text 3: Lactic acid is a product of anaerobic respiration. This occurs when oxygen is starved. Glycolysis of glucose to pyruvate produces a net gain of 2 ATP. Also in glycolysis NAD is reduced to form NADH. The conversion of pyruvate produces NAD⁺ from NADH so NAD⁺ can be recycled. ATP is an energy intermediary.