MEGA LECTURE

AQA (GCSE Notes)

Chapter 3: Infection and Response

Q1. What are pathogens and how do they cause disease in animals and plants?

Q2. How do viruses reproduce inside the human body?

Q3. Explain how bacteria make us feel ill once they enter the body.

Q4. What is the difference between how viruses and bacteria cause harm in the body?

Q5. How can pathogens be spread from one organism to another?

Q6. Why is it important to reduce contact with pathogens?

Q7. How can clean water supplies help prevent the spread of communicable diseases?

Q8. In what ways can air be a method for spreading pathogens?

Q9. Describe how direct contact spreads infectious diseases in humans.

Q10. How do plants become infected by pathogens in their environment?

Q11. What role do toxins play in bacterial infections?

Q12. Why is damaging tissues a problem when infected by pathogens?

Q13. How does the immune system respond when a pathogen enters the body?

Q14. What happens if the immune system cannot destroy a pathogen?

Q15. What is the purpose of vaccinations in preventing diseases?

Q16. How do vaccines prepare the immune system to fight pathogens?

Q17. Why are young children often vaccinated against measles?

Q18. Describe the main symptoms of measles.

Q19. How is the measles virus transmitted between individuals?

Q20. Why can measles be a life-threatening disease?

Q21. What causes the immune system to become weak in people with untreated HIV?

Q22. How is HIV spread from one person to another?

Q23. What are the early symptoms of HIV infection?

Q24. Why are antiretroviral drugs important in managing HIV?

Q25. What is AIDS and how does it develop from HIV?

Q26. What is meant by late-stage HIV infection?

Q27. Explain how sharing needles can spread HIV.

Q28. Why does HIV make people more vulnerable to other infections?

Q29. Describe the symptoms of tobacco mosaic virus in plants.

Q30. How does TMV affect the growth of a plant?

Q31. What is the link between TMV and photosynthesis in plants?

Q32. Why does TMV cause a 'mosaic' pattern on leaves?

Q33. How can TMV spread from plant to plant?

Q34. Why is TMV a serious issue for crop production?

Q35. Why do viruses often spread quickly once inside a host?

Q36. How do viral infections damage the cells of the host?

Q37. What are the main differences between bacterial and viral reproduction?

Q38. Why is it difficult to treat diseases caused by viruses?

Q39. How has antibiotic resistance affected the treatment of bacterial infections?

Q40. What factors contribute to bacteria becoming resistant to antibiotics?

Q41. Why is it important to develop new antibiotics?

Q42. How does the overuse of antibiotics increase resistance?

Q43. What can individuals do to help prevent antibiotic resistance?

Q44. Why is it important to complete a full course of antibiotics?

Q45. How can good hygiene reduce the spread of pathogens?

Q46. What barriers does the human body use to keep pathogens out?

Q47. How does the skin protect the body from infections?

Q48. What role do white blood cells play in fighting diseases?

Q49. Why do some pathogens only infect plants and not animals?

Q50. What can farmers do to prevent the spread of plant diseases like TMV?

Q51. What type of microorganism causes salmonella food poisoning?

Q52. How is salmonella food poisoning commonly spread to humans?

Q53. What are the symptoms of salmonella infection in the human body?

Q54. How do the toxins from salmonella bacteria cause illness?

Q55. Why are poultry in the UK vaccinated against salmonella?

Q56. What steps can be taken in food preparation to reduce the risk of salmonella infection?

Q57. How can personal hygiene help prevent the spread of salmonella?

Q58. What type of disease is gonorrhoea and what causes it?

Q59. Describe the symptoms of gonorrhoea in infected individuals.

Q60. How is gonorrhoea transmitted from one person to another?

Q61. What is the role of antibiotics in the treatment of gonorrhoea?

Q62. Why is it now harder to treat gonorrhoea with penicillin?

Q63. What is antibiotic resistance and how has it affected the treatment of gonorrhoea?

Q64. How can barrier methods help reduce the spread of gonorrhoea?

Q65. Why is it important to diagnose and treat gonorrhoea early?

Q66. What long-term health problems can gonorrhoea cause if left untreated?

Q67. How can public awareness campaigns help control the spread of bacterial STDs?

Q68. What is rose black spot and what type of organism causes it?

Q69. Describe the visible effects of rose black spot on a plant.

Q70. How does rose black spot affect the process of photosynthesis?

Q71. What environmental conditions help the spread of rose black spot?

Q72. How can rose black spot be spread from one plant to another?

Q73. What are two main methods used to treat or control rose black spot?

Q74. Why is it important to remove and destroy leaves infected with rose black spot?

Q75. How does reducing photosynthesis affect a plant's growth?

Q76. How does the spread of rose black spot affect garden plants and crops?

Q77. What is malaria and what type of microorganism causes it?

Q78. What is a vector and how is it involved in the transmission of malaria?

Q79. Describe the life cycle of the malarial protist involving mosquitoes.

Q80. What symptoms are typically caused by malaria?

Q81. Why can malaria be fatal if left untreated?

Q82. How do mosquito nets help reduce the spread of malaria?

Q83. Why is preventing mosquito breeding important in controlling malaria?

Q84. What are some common places where mosquito vectors can breed?

Q85. How can local communities help reduce mosquito populations?

Q86. What role do antimalarial drugs play in treating malaria?

Q87. Why does malaria cause repeated episodes of fever?

Q88. What challenges exist in completely eradicating malaria?

Q89. How can education and awareness help reduce malaria infections?

Q90. What are the advantages of using both nets and insect sprays in malaria prevention?

Q91. Why is malaria more common in some parts of the world than others?

Q92. How might climate affect the spread of diseases like malaria?

Q93. What are the main differences between fungal, bacterial, and protist infections?

Q94. How does the method of transmission differ between salmonella and malaria?

Q95. How do treatments for fungal diseases differ from treatments for bacterial diseases?

Q96. What are the public health risks of not treating communicable diseases like gonorrhoea?

Q97. How can monitoring disease outbreaks help reduce the spread of infectious diseases?

Q98. What steps can be taken to reduce the spread of fungal diseases in plants?

Q99. Why is it important for farmers and gardeners to identify rose black spot early?

Q100. How does international travel increase the risk of spreading diseases like malaria?

Q101. How does the skin act as a barrier to prevent the entry of pathogens?

Q102. What role do tiny hairs and mucus in the nose play in protecting the body from infection?

Q103. Describe how the trachea and bronchi help prevent pathogens from reaching the lungs.

Q104. How does stomach acid protect the body from harmful microorganisms?

Q105. What is meant by a non-specific defence system in the human body?

Q106. How does phagocytosis help defend the body against pathogens?

Q107. What are antibodies and how do they help protect the body from disease?

Q108. What is the function of antitoxins in the immune response?

Q109. How does the immune system respond when a pathogen enters the body?

Q110. Why is the immune system considered a specific defence mechanism?

Q111. What is vaccination and how does it help prevent disease?

Q112. Why is only a small amount of dead or inactive pathogen needed in a vaccine?

Q113. How does the body respond when the same pathogen enters again after vaccination?

Q114. Why does vaccination help to protect people who are not immunised?

Q115. What is meant by herd immunity and how is it achieved?

Q116. Why do vaccinated individuals not become ill when exposed to the real pathogen?

Q117. Why is it important to vaccinate a large part of the population?

Q118. How do white blood cells respond to a vaccine?

Q119. Why is vaccination more effective before someone is exposed to a disease?

Q120. What are the benefits of global vaccination programmes?

Q121. How has vaccination helped reduce global cases of certain infectious diseases?

Q122. What challenges exist in ensuring global access to vaccines?

Q123. How can vaccines help prevent the spread of new or emerging diseases?

Q124. What is the difference between treating a disease and preventing it?

Q125. Why are antibiotics not effective against viruses?

Q126. How do antibiotics work to cure bacterial infections?

Q127. Why must specific antibiotics be used for specific bacterial infections?

Q128. What is antibiotic resistance and why is it a serious concern?

Q129. How can the overuse of antibiotics contribute to resistance?

Q130. What steps can be taken to reduce the development of antibiotic resistance?

Q131. Why is it important to complete a full course of antibiotics?

Q132. What are the dangers of using antibiotics for viral infections?

Q133. Why are painkillers not a cure for disease?

Q134. How do painkillers help during illness even though they do not remove pathogens?

Q135. What makes it difficult to develop antiviral drugs?

Q136. Why might a drug that kills a virus also harm human cells?

Q137. How do scientists test new drugs to make sure they are safe and effective?

Q138. What are the key differences between antibiotics and painkillers?

Q139. How have antibiotics improved public health?

Q140. Why is it important to discover new antibiotics?

Q141. What are the risks if bacteria become resistant to all known antibiotics?

Q142. What is the role of clinical trials in the development of medicines?

Q143. How does antibiotic resistance spread between bacteria?

Q144. What practices in farming can lead to antibiotic resistance?

Q145. Why should antibiotics only be prescribed when absolutely necessary?

Q146. What is the role of healthcare professionals in preventing antibiotic resistance?

Q147. Why is it a problem if people stop taking antibiotics early?

Q148. How can education reduce misuse of antibiotics?

Q149. Why is the use of vaccines important in reducing antibiotic use?

Q150. What strategies can be used to slow the development of drug-resistant bacteria?

Q151. What is the main purpose of drug testing before a new medicine is approved for use?

Q152. What are the three key factors new drugs are tested for during development?

Q153. What is meant by toxicity in drug testing?

Q154. Why is efficacy an important part of drug development?

Q155. What is meant by the dose of a drug and why must it be tested?

Q156. What is preclinical testing and what does it involve?

Q157. Why are cells and tissues used during early stages of drug testing?

Q158. Why are live animals sometimes used in preclinical testing?

Q159. What is clinical testing and who is involved in this stage?

Q160. Why are healthy volunteers used in the first phase of clinical trials?

Q161. What is the benefit of starting clinical trials with very low doses?

Q162. Why are patients used in later stages of clinical testing?

Q163. What is the purpose of finding the optimum dose in clinical trials?

Q164. What is a placebo and how is it used in drug trials?

Q165. What is the purpose of a double-blind trial?

Q166. How does a double-blind trial prevent bias?

Q167. What role does peer review play in drug development?

Q168. Why are drug trial results not released until after peer review?

Q169. What could happen if a drug was released without proper testing?

Q170. Why is it important for drug trials to be repeated and confirmed?

Q171. How does peer review improve the reliability of drug trial data?

Q172. Why might a promising drug in the lab fail during clinical trials?

Q173. Why are some medicines derived from plants?

Q174. What is the origin of the drug digitalis and what plant is it from?

Q175. From which plant was aspirin originally derived?

Q176. Who discovered penicillin and how was it found?

Q177. What type of microorganism produced the first antibiotic?

Q178. Why is the discovery of penicillin considered a major scientific achievement?

Q179. How do modern scientists use plants in drug discovery today?

Q180. Why are most new drugs now made by chemists rather than found in nature?

Q181. How might a chemical found in a plant be turned into a medicine?

Q182. What is the importance of synthetic drug production?

Q183. Why is it still useful to study natural sources for new drugs?

Q184. What are some examples of diseases that were treated with plant-based drugs?

Q185. How do scientists decide which chemicals are worth testing for drug use?

Q186. What safety checks must be passed before a drug can be used by the public?

Q187. How long can the full drug development process take from discovery to approval?

Q188. What are the risks of skipping steps in drug testing?

Q189. How does patient health affect clinical testing?

Q190. Why are side effects monitored during all phases of clinical trials?

Q191. How do scientists monitor whether a drug is working in a patient?

Q192. What happens if serious side effects are found during clinical trials?

Q193. Why is it important that patients do not know whether they are receiving a drug or placebo?

Q194. How is the final decision made to approve a new medicine?

Q195. What organisations or agencies regulate drug testing and approval?

Q196. Why might a drug be approved in one country but not in another?

Q197. How do clinical trials make sure that results are not biased?

Q198. What ethical considerations are involved in animal testing for new drugs?

Q199. What happens if a drug passes all trials but later causes problems in the wider population?

Q200. How has the process of drug discovery changed over the last 100 years?

Q201. What is meant by the term "monoclonal antibodies"?

Q202. Why are monoclonal antibodies specific to only one type of antigen?

Q203. What type of cells are used to produce monoclonal antibodies?

Q204. Why are mouse lymphocytes used in the production of monoclonal antibodies?

Q205. What is the role of tumour cells in producing monoclonal antibodies?

Q206. What is a hybridoma cell and how is it formed?

Q207. Why are hybridoma cells useful in antibody production?

Q208. How are hybridoma cells cloned to produce monoclonal antibodies?

Q209. Why is it important that hybridoma cells can divide and produce antibodies?

Q210. How is the monoclonal antibody purified once it has been produced?

Q211. Why are monoclonal antibodies useful in medical applications?

Q212. How can monoclonal antibodies be used in pregnancy testing?

Q213. What role do monoclonal antibodies play in measuring hormone levels in the blood?

Q214. How can monoclonal antibodies help detect pathogens in a sample?

Q215. How are monoclonal antibodies used in research to locate specific molecules in tissues?

Q216. Why is a fluorescent dye attached to monoclonal antibodies in some tests?

Q217. How can monoclonal antibodies be used to treat cancer?

Q218. What types of substances can be attached to monoclonal antibodies in cancer treatment?

Q219. Why do monoclonal antibodies only target specific cells like cancer cells?

Q220. How do monoclonal antibodies avoid damaging healthy cells during treatment?

Q221. Why were monoclonal antibodies once thought to be a breakthrough in medicine?

Q222. What are some side effects that have been linked to monoclonal antibody treatments?

Q223. Why are monoclonal antibodies not yet widely used in medicine?

Q224. What are the ethical concerns in using animals to produce monoclonal antibodies?

Q225. How can monoclonal antibodies improve early disease diagnosis?

Q226. Why might scientists choose monoclonal antibodies over traditional diagnostic tools?

Q227. What challenges exist in producing monoclonal antibodies on a large scale?

Q228. How can monoclonal antibodies be designed to bind to a specific protein?

Q229. Why is it important that monoclonal antibodies are identical?

Q230. In what way do monoclonal antibodies increase the accuracy of diagnostic tests?

Q231. How are monoclonal antibodies different from the antibodies produced naturally in the body?

Q232. Why is combining tumour cells with lymphocytes necessary in this process?

Q233. How do monoclonal antibodies contribute to personalised medicine?

Q234. Why might some patients respond better to monoclonal antibody treatment than others?

Q235. How can monoclonal antibodies be used to deliver drugs directly to infected or diseased cells?

Q236. What is the advantage of using monoclonal antibodies in targeted cancer therapy?

Q237. Why is it important to monitor the side effects of monoclonal antibody treatments?

Q238. How can researchers test the effectiveness of monoclonal antibodies in the lab?

Q239. Why is it useful to attach radioactive substances to monoclonal antibodies?

Q240. What does it mean for a monoclonal antibody to be highly specific?

Q241. How might monoclonal antibodies reduce the need for more general treatments like chemotherapy?

Q242. What limits the current use of monoclonal antibodies in clinical treatments?

Q243. How do monoclonal antibodies help scientists understand diseases at a molecular level?

Q244. What steps are involved in creating monoclonal antibodies in the lab?

Q245. Why is quality control important in the production of monoclonal antibodies?

Q246. How could monoclonal antibodies be used in responding to emerging infectious diseases?

Q247. What are the possible risks of relying too heavily on monoclonal antibody therapy?

Q248. What are the advantages of monoclonal antibodies compared to traditional treatments?

Q249. What factors must be considered when deciding to use monoclonal antibody treatment?

Q250. How could future developments improve the safety and effectiveness of monoclonal antibodies?

Q251. What are common visible symptoms that help detect disease in plants?

Q252. How does stunted growth indicate that a plant may be diseased?

Q253. What does the presence of leaf spots suggest about a plant's health?

Q254. How can areas of decay on a plant be used to identify disease?

Q255. Why might malformed stems or leaves be a sign of plant infection?

Q256. How does discolouration of leaves help in detecting plant disease?

Q257. What types of pests can be found on infected plants?

Q258. How can gardeners use manuals or websites to identify plant diseases?

Q259. Why might infected plants be sent to laboratories for analysis?

Q260. How can monoclonal antibody testing kits be used to detect plant disease?

Q261. What type of pathogen causes tobacco mosaic virus?

Q262. What are the symptoms of tobacco mosaic virus on plant leaves?

Q263. How does tobacco mosaic virus affect plant growth?

Q264. What type of pathogen causes rose black spot?

Q265. What are the symptoms of rose black spot?

Q266. How does rose black spot reduce a plant's ability to photosynthesise?

Q267. What are aphids and how do they damage plants?

Q268. How can aphid infestations be identified on plants?

Q269. What is nitrate deficiency and how does it affect plant growth?

Q270. Why are nitrate ions important for healthy plant development?

Q271. What is chlorosis and what causes it?

Q272. Why are magnesium ions needed by plants?

Q273. How do magnesium deficiencies affect photosynthesis?

Q274. What methods can be used to treat nitrate deficiency in soil?

Q275. How can understanding ion deficiencies improve farming practices?

Q276. How do cellulose cell walls help protect plants from pathogens?

Q277. What is the role of a waxy cuticle in plant defence?

Q278. How do layers of dead cells like bark protect plants?

Q279. Why is the shedding of bark useful in plant defence?

Q280. What are antibacterial chemicals and how do they protect plants?

Q281. How do plants use poisons to deter herbivores?

Q282. What are thorns and how do they help defend plants?

Q283. How do hairs on leaves and stems protect plants from animals?

Q284. Why do some plants curl or droop their leaves when touched?

Q285. How does mimicry help protect plants from being eaten?

Q286. What is the difference between physical and chemical plant defences?

Q287. Give one example of a physical barrier in plants and explain how it works.

Q288. How can chemical defences in plants be useful to humans?

Q289. How are mechanical defences different from physical barriers?

Q290. Why do scientists study plant defences against disease?

Q291. How can plant disease detection benefit crop production?

Q292. What is the benefit of using monoclonal antibodies over visual inspection in plant diagnosis?

Q293. Why is early detection of plant disease important for farmers?

Q294. What can be done if a plant is diagnosed with rose black spot?

Q295. How can controlling aphids help reduce the spread of disease?

Q296. How do gardening manuals support home growers in diagnosing plant problems?

Q297. What are the signs that a plant has a nutrient deficiency rather than a pathogen?

Q298. Why do some plants develop poisons as a defence strategy?

Q299. How does a strong waxy cuticle reduce the risk of infection?

Q300. In what ways can scientific knowledge about plant disease be applied in agriculture?