



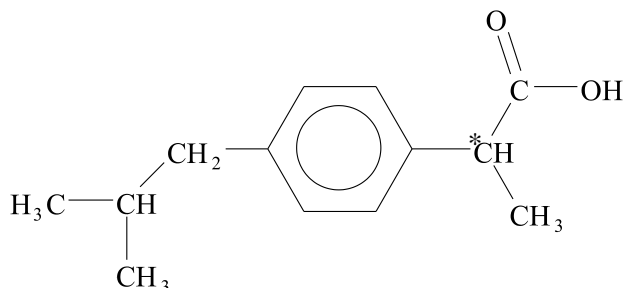
1. (a) bacteria are self-reproducing units while viruses are not / viruses need living hosts/cells to multiply / *OWTTE*;
bacteria are able to grow/metabolize/feed and excrete / viruses lack metabolic functions;
bacteria contain various cell subunits/organelles/cell wall (performing specific functions) / viruses consist only of genetic material and protective coating;
bacteria are (many times) larger than viruses / viruses are smaller than bacteria;
bacteria have more complex DNA / viruses have simpler DNA;
viruses mutate/multiply (much) faster than bacteria / bacteria mutate/multiply slower than viruses;
If comparative term used e.g. smaller what it's compared to is not required. 2 max
- (b) alter cells genetic material so that virus cannot use it to multiply;
prevent viruses from multiplying by blocking enzyme activity within host cell / inhibit the synthesis of viral components by blocking enzymes inside the cell;
prevent viruses from entering (human) cell / bind to cellular receptors targeted by viruses / bind to virus-associated proteins/VAPs which target cellular receptors;
prevent/hinder the release of viruses from the cell; 2 max
- (c) viruses mutate quickly so adapt to drugs/evade immune system response / *OWTTE*;
bacteria are more complex and thus can be targeted in more ways / viruses lack subunits/functions targeted by antibacterials / *OWTTE*;
bacteria can be killed/impaired by simple chemical agents / viruses cannot be killed and must be targeted on genetic level / *OWTTE*;
different types of bacteria employ similar metabolic processes and thus can be targeted by common antibacterials / each kind of virus usually requires special drugs/approaches / *OWTTE*; 3 max
2. HIV invades/bind to white blood cells/T4/T cells / *OWTTE*;
HIV viruses can mutate;
HIV viruses have similar metabolism to (human) cells/uses host cells to replicate;
high price of (antiretroviral) drugs / socioeconomic / cultural issues; 4

[7]

[4]



3. (a)



1

- (b) a chiral auxiliary is itself an enantiomer;
it is bonded to the reacting molecule to create the stereochemical conditions necessary to follow a certain pathway;
once the desired enantiomer is formed the auxiliary is removed;
different enantiomers may have different biological effects (some of which may be harmful);
genetic defects/deformities;

5

[6]

4. (i) benzene/aromatic ring/ C_6H_5 /phenyl;
Accept the circle-in-hexagon or Kekule symbols
Do not allow benzene or arene.

amine/ NH_2 / amino;

Do not award mark if reference to secondary/tertiary given.

2

- (ii) to overcome the resistance that bacteria develop to existing antibiotics /
increases resistance to penicillinase enzyme / *OWTTE*;
Do not accept "over prescription".

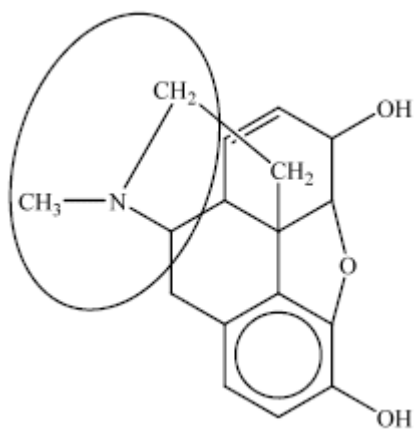
prevents penicillinase enzyme from destroying penicillin / molecules have
different shape/stability/solubility/side-chain / *OWTTE*;

2

[4]



5. (i)



any circle around the nitrogen atom / the nitrogen atom and its three neighbouring atoms;

1

(ii) tertiary;

1

(iii) ester;

1

[3]