CHAPTER 10

All of the multiple choice questions comprise five options, one of which is the correct answer.

Most of the questions require the reader to identify the correct statement from among a list of options. Some of these options are totally fictitious.

1. Which of the following is a measure which can be used to control a faecally transmitted helminth that has a direct lifecycle?

   a) Washing fruit and vegetables before they are consumed.
   b) Targetting the intermediate host.
   c) Draining any nearby marshland.
   d) Collecting diagnostic samples at a particular time of day.
   e) Screening blood before it is used in transfusion.

2. Which of the following control measures has helped bring *Onchocerca volvulus* under control in West Africa?

   a) Encouraging people in endemic areas to drastically change their lifestyle.
   b) Distributing free bed-nets.
   c) Treating rivers with insecticides to kill blackfly larvae.
   d) Composting of human faecal waste matter.
   e) Spraying huts with insecticides to kill triatomid bugs.

3. Which of the following is a desirable attribute of an ‘ideal’ anti-parasitic drug for use in human medicine?

   a) Requires a course of only seven doses to remove the infection.
   b) Has a narrow spectrum of activity.
   c) Can be administered by intra-peritoneal injection.
   d) Must be administered by a trained medical professional. This ensures that the patient always receives the correct dose.
   e) Is chemically stable.

4. Which of the following statements about avermectins is correct?

   a) They have a very narrow spectrum of activity.
   b) They are very effective treatments for Gram negative bacterial infections.
   c) They are active against arthropod ectoparasites.
   d) Effective treatment to remove a helminth infection usually takes 12 months with weekly doses of the drug required.
   e) A single dose is very expensive and therefore avermectins are rarely used in the treatment of domestic animals.
5. Which of the following is most likely to ensure patient compliance in completing a prescribed course of treatment with an anti-parasitic drug?

a) The drug tastes repellent because this means that the patient will think it is doing him/her good.
b) The drug interacts adversely with other commonly used medicines because this will ensure that the patient prioritises the anti-parasitic drug.
c) The drug requires special equipment to administer because this will mean that the patient takes his/her treatment seriously.
d) The drug has minimal side effects because the patient will therefore not associate the drug with unpleasant experiences.
e) Treatment with the drug restricts what the patient could eat or drink during treatment because this would have a healthy lifestyle.

6. Which of the following statements correctly explains why cyromazine is safe to use for the treatment of arthropod parasites of mammals?

a) It interferes with the moulting process between arthropod life cycle stages and this is not a physiological process that occurs in mammals.
b) Cyromazine is a natural product and therefore less toxic than pharmaceutical drugs.
c) It is a homeopathic remedy and therefore used at extremely low concentrations that are not toxic.
d) Its mechanism of action is to inhibit of keratin synthesis and thus acts on a metabolic pathway not found in mammals.
e) Its mechanism of action is to interfere with DNA uncoiling and thus acts on a metabolic pathway not found in mammals.

7. Which of the following statements is correct?

a) The majority of drugs used to treat protozoan infections in humans are produced naturally by soil fungi.
b) Most anthelmintic agents are also effective against Gram positive bacteria.
c) Many of the anti-parasitic drugs now used in human medicine were originally developed for use against parasites of domestic or farm animals.
d) Screening of potential anti-parasitic drugs has traditionally been quick and cost-effective since it is easy to design excellent in vitro culture systems.
e) Many of the anthelmintic drugs used in veterinary medicine are produced naturally by soil fungi.
8. Which of the following statements is correct? The *Plasmodium* spp. isoprenoid biosynthesis pathway can be selectively targeted because \(...\):

a) *Plasmodium* synthesises isoprenoids via the mevalonate pathway which is not used by mammalian cells.

b) Both mammals and *Plasmodium* use the mevalonate pathway for isoprenoid biosynthesis but there is a divergent step in the process where a different intermediate component is used.

c) Protozoa synthesise isoprenoids *de novo* while mammalian cells do not.

d) Mammals use the mevalonate pathway to synthesise isoprenoids, while *Plasmodium* uses the MEP pathway which is different.

e) Mammals use the MEP pathway to synthesise isoprenoids, while *Plasmodium* uses the mevalonate pathway which is different.

9. Which of the following is an epigenetic factor?

a) Histone modification.

b) RNA methylation.

c) DNA acylation.

d) Histidine elongation.

e) DNA hydrolysis.

10. Which of the following may limit the effectiveness of siRNA technology as a means of treating *Babesia bovis* infections?

a) The parasite does not contain RNA.

b) Cows and other bvids have extremely active RNAase enzymes that degrade the siRNA before it can reach the parasite.

c) *Babesia bovis* lacks an active RNA interference pathway.

d) It is not possible to deliver siRNA to intracellular parasites.

e) For the technique to work, the siRNA has to be first modified within the host cell nucleus and *Babesia bovis* lives within red blood cells, which lack a nucleus.

11. Which of the following materials has proved most useful for the manufacture of nanoparticles for the delivery of antiparasitic drugs?

a) Antimony.

b) Gold.

c) Aluminium.

d) Cellulose.

e) Copper.
12. Which of the following statements about geldanamycin is correct?

a) It binds to Hsp90 in *Plasmodium falciparum*.
b) It interferes with the function of Hsp90 in *Ascaris lumbricoides*.
c) It promotes the formation of Hsp60 by *Plasmodium vivax*.
d) It has a wide safety margin.
e) It binds to a variety of heat shock proteins.

13. Which of the following statements about vaccines against parasitic infections is correct?

a) Attenuated vaccines, such as the one used against *Ancylostoma caninum*, are very safe because the parasites are killed during preparation.
b) An anti-sporozoite vaccine against *Plasmodium* spp. would prevent the person being vaccinated from contracting clinical malaria.
c) A recombinant sub-unit vaccine has been developed which can protect sheep against the development of *Taenia ovis* cysticerci.
d) Effective DNA vaccines against parasitic infections are unlikely to be developed because extremely high doses need to be given to counter the degradation of the vaccine DNA by DNAase enzymes in the host.
e) A killed vaccine against *Cryptosporidium parvum* has been developed which was tested on mice and delivered by nasal spray.

14. Which of the following statements is correct?

a) Elimination means that the pathogen no longer exists anywhere in the world.
b) It is easier to control zoonotic diseases than non-zoonotic diseases.
c) Malaria is no longer endemic in the UK owing to the widespread use of insecticides.
d) *Dracunculus medinensis* is on the verge of extinction.
e) Meat hygiene regulations and compulsory worming of farm dogs have led to the elimination of *Echinococcus multilocularis* from the British mainland.

15. Which of the following statements is correct? Education campaigns to prevent exposure of humans and their domestic livestock to parasitic infections often work best when ...:

a) Printed leaflets are written in English since this makes the information clear and are widely distributed.
b) Radio, television and the internet are avoided as means of disseminating information as people do not trust them.
c) Messages about avoiding infection are given by respected members of the community, such as teachers, to school children and their mothers.
d) People are advised to drastically change their behaviour or eating habits since this keeps them focussed on avoiding the infection.
e) The information they are given includes stories of people in other countries and cultures suffering from the disease.

16. Which of the following environmental modification measures has NOT been shown to be useful in reducing the transmission of parasitic infections?

a) Composting of human faecal waste.
b) Constructing animal shelters and houses from concrete rather than other traditional materials such as mud.
c) Regular movement of grazing animals to alternative pastures.
d) Draining wetland areas close to where humans are living.
e) Felling trees close to areas where humans are living.

17. Which of the following statements concerning control programmes for specific infections in particular areas is correct?

a) They are not helped by remote sensing when transmission involves seasonal migration of vectors.
b) They must never involve drug treatment of everyone in the population without laboratory confirmation of the infection where this is cheaper and easier.
c) They are sometimes more effective when only people diagnosed with the infection are treated.
d) They should not be integrated into existing health or education systems.
e) They are unlikely to be interrupted by disruption to a country’s infrastructure brought about by severe drought or civil war.