

Pharmaceutics

1- Which of the following describes the roles of mannitol in the pharmaceutical solutions?

Cryoprotectant, Buffering agent

Cryoprotectant, Antioxidant

Sweetener, Antioxidant

Sweetener, Isotonicity adjuster

2- The following statement of “Alcoholic or hydroalcoholic solutions of volatile substances” describes:

Aromatic waters

Spirits

Linctuses

Liniments

3- Which of the following drug property is suitable for transdermal drug delivery?

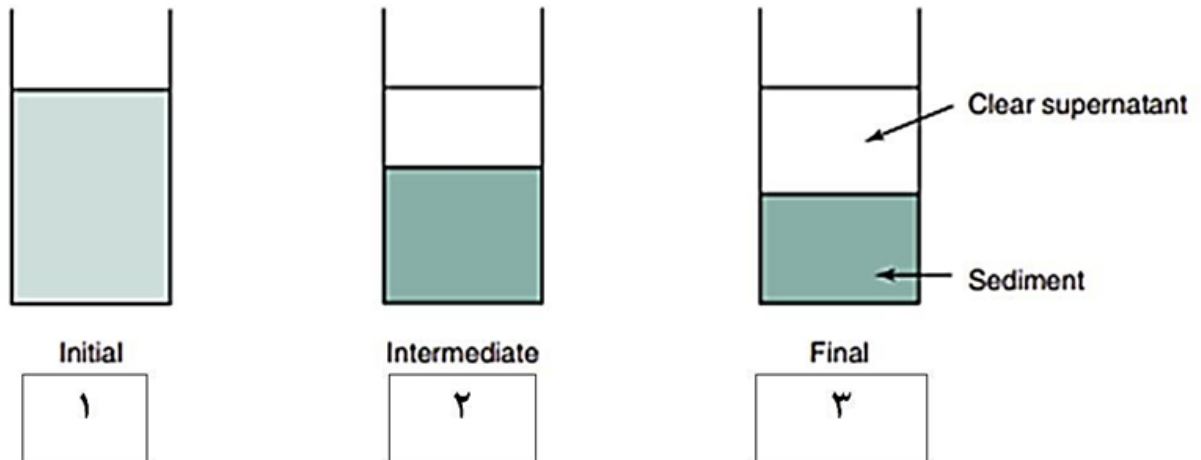
Molecular weight between 800 to 1000 Dalton

Molecular weight between 1000 to 1500 Dalton

Daily dose between 50 to 100 mg

Log p between 1 to 4

4- The following steps represent which structure in suspensions?



Formation of a compact sediment (cake) at the bottom of the container

Reversible aggregation of particles forming loose clusters

Irreversible aggregation of particles leading to the formation of larger particles

Non-uniform particle-size distribution of droplets in the medium

5- Arabic gum and tragacanth are used for which purpose in suspension formulations?

Suspending agents

Humectant

Anti-microbial preservative

Binder

6- Which of the following is the main mechanism of mixing in tumbling mixers?

Convection mixing

Diffusion mixing

Shear mixing

Turbulent mixing

7- Which of the following mills produce smaller particles?

Hammer mill

Cutting mill

Ball mill

Fluid energy mill

8- To prepare an O/W emulsion with a required HLB of 10.5, what ratio of Tween 80 (HLB=15) and Span 80 (HLB=4.3) is needed?

52% tween 80, 48% span 80

58% tween 80, 42% span 80

68% tween 80, 32% span 80

65% tween 80, 35% span 80

9- Which of the following statements is correct regarding dissolution apparatus for various pharmaceutical dosage forms?

Dissolution apparatus III is suitable for evaluation of modified release dosage forms.

In dissolution apparatus II, the usual speed of rotation is between 200-300rpm.

Dissolution apparatus I is known as paddle.

Dissolution apparatus IV is only use for small and limited dissolution medium volumes.

10- The following formulation represents which of the following product?

Stearic acid 18g

Triethanolamine 1g

Glycerol 10g

Purified water qs to 100g

Cold Cream

Hydrophilic Ointment

Vanishing Cream

Simple Ointment

11- Emulsifying Ointment belongs to which ointment base?

Hydrocarbon base

Absorption base

W/O emulsion base

O/W emulsion base

12- According to WHO guidelines, under which of the following conditions is long-term stability studies conducted in Iran?

40°C, 75% relative humidity (RH)

30°C, 65% RH

25°C, 60% RH

40°C, 60% RH

13- Which of the following granulation instrument is used in dry granules preparation?

High speed mixer/Granulators

Fluidized bed granulators

Roller compactor

Spray dryer

14- Which of the following instruments is used for Agglomerated powders preparation?

Fluidized spray dryer

Spray dryer

Fluidized bed dryer

Freeze dryer

15- What is the maximum acceptable friability value for tablets during the friability test?

less than 0.5%

less than 1 %

less than 2 %

less than 5 %

16- As shown in below figure, what is the name of the mechanism by which stirring granules causes material to abrade from their surface and adhere to other granules, resulting in the formation of larger granules?



Coalescence

Breakage

Abrasion transfer

Layering

17- Which of the following excipient is used as dry and solution binder in tablet preparation?

Polyvinylpyrrolidone

Starch

Cellulose

Gelatin

18- Which of the following formulation is related to effervescent tablets?

Cellulose, Gelatin, Magnesium stearate

Lactose, Microcrystalline cellulose, Magnesium stearate

Magnesium stearate, Tartaric acid, Gelatin

Sodium carbonate, Tartaric acid, PEG 4000

19- Which of the following infectious agents exhibits the greatest heat resistance?

Bacteria

Viruses

Prions

Bacterial Spores

20- Which of the following polymer particularly used for dry powder inhaler (DPI) capsules?

Polyvinyl acetate

Hypromellose

Hydroxypropyl cellulose

Hydroxyethyl cellulose

21- Which of the following is incorrect regarding hard and soft gelatin capsules?

Hard capsules are typically composed of gelatin, water, and additives, while soft capsules may contain plasticizers.

Hard capsules are manufactured as two separate pieces, while soft capsules are produced as a single unit.

Soft capsules are suitable for liquid pharmaceutical formulations, while hard capsules are only used for powders.

The filling processes for hard and soft capsules are different.

22- What is the first step in producing a hard gelatin capsule shell?

Prepare an aqueous gelatin solution with a concentration of 40 to 50 percent and add plasticizer to it at room temperature.

Prepare a gelatin solution with a concentration of 35 to 40 percent in demineralized water at 60 to 70 °C.

Add plasticizer and dye to a 10 to 20 percent gelatin solution at 50 °C.

Prepare an aqueous gelatin solution of 5 to 20 percent at room temperature.

23- In which stage of sugar coating process, Polyvinyl acetate phthalate is used?

Sealing

Subcoating

Smoothing

Polishing

24- The D_{90} value for a bacterium is 3 minutes. If starting culture has 10^5 cfu/ml, how long should this suspension be kept at 90°C to kill the entire population?

12 min

15 min

18 min

21 min

25- Accela-cota equipment is classified as a

Perforated coating pan

Traditional coating pan

Fluidized bed coater

Dria coater

26- Which of the following polymers used in the process of filmcoating, is water insoluble?

HPMC

Povidone

Ethylcellulose

PEGs

27- In which drug delivery systems, hydrostatic pressure is the main mechanism of drug release?

Osmotic pump

Insoluble polymeric matrix

Hydrophilic polymeric matrix

Ionic exchange systems

28- In which of the following nebulizer systems, piezoelectric crystals are used for the production of fine respiratory droplets?

Mesh nebulizer

Jet nebulizer

Air-blast nebulizer

Air-jet nebulizer

29- In which kind of gastro retentive systems, sodium bicarbonate is regularly used?

Hydrophilic matrix systems

Floating systems

Size-increasing systems

Mucoadhesive systems

30- Which of the following systems forms spontaneously?

Nanoemulsions

Coarse emulsions

Suspensions

Microemulsions

31- To prepare 6 suppositories, each weighing 1 gram and containing 250 mg of bismuth subgallate with a displacement value of 3, how much suppository base is needed?

4.5 g

4.75 g

5 g

5.5 g

32- In ophthalmic formulations, which surfactant is the most commonly used?

Alkyl sulfates

Monovalent salts of fatty acids

Polysorbates

Polyvalent salts of fatty acids

33- In which pH range, sodium bisulfite is used as an antioxidant in parenteral products?

Acidic pHs

Alkaline pHs

Neutral pHs

In all pHs

34- Which suspending agent can be used in injectable suspensions?

PEG 400

Povidone

Sodium sulfite

Methyl cellulose

35- Which of the following is correct about the surface tension?

With the addition of methanol to water, the surface tension of water increases linearly as well.

Addition of organic impurities leads to a significant reduction in the surface tension of water.

With the addition of ionic compounds, the surface tension of the water is reduced.

By adding hydrophobic compounds to the water, the surface tension of the water increases.

36- Which equivalent sphere diameter is calculated from the diffusion coefficient according to the Stokes-Einstein equation?

Martin diameter

Surface diameter

Hydrodynamic diameter

Feret diameter

37- In the study of material decomposition, which one is correct about the Arrhenius equation?

The rate constant of the gases value is $0.821 \text{ L.at.mol}^{-1}\text{K}$ in this field.

By plotting the reaction rate constant (k) against temperature, the Arrhenius constant can be calculated from the slope.

This equation is used to investigate catalytic effect of H^+ ion concentration on the reaction rate constant.

Using this equation, the activation energy of the reaction can be calculated from the slope.

38- Which of the following laws is used to determine the viscosity of a fluid by the Falling sphere viscometer?

Rheynolds

Stokes

Ostwald

Thixotropy

39- Which of the following methods is used to adjust the iso-tonicity of a hypotonic injectable solution?

Freezing point depression

Increase in vapor pressure

Increase in buffer capacity

Boiling point depression

40- According to DLVO theory, in which phase of the total potential energy of interaction versus particulate inter-distance diagram can particle flocculation be formed?

Primary minimum

Primary maximum

Secondary minimum

Primary and secondary minimum

41- According to the Noyes-Whitney equation, which of the following presents a sink condition?

In the case where C_s is greater than 10% of C

In the case where C_s is equal to C

In the case where C is always less than 10% of C_s

In the case where C_s is always less than 10% of C

42- Which option is correct regarding emulsions?

Reducing the area of the interfacial region, can increase the thermodynamic stability.

Reducing the interfacial tension, can increase the Gibbs free energy.

As the size of the droplets in dispersed phase decreases, the Gibbs free energy decreases.

The use of surfactants leads to a decrease in thermodynamic stability.

43- In which option the drug efflux transporter and its location in the small intestine are consistent?

MDR1-Apical membrane

BCRP-Basal membrane

P-gp-Basal membrane

MRP1-Apical membrane

44- For two products to be considered pharmaceutical alternatives, they must necessarily...

Have the same type and amount of active ingredient

Contain the same salt or ester form of the active ingredient

Have the same type of active ingredient and dosage form

Have the same type of active ingredient.

45- A drug is to be administered repeatedly to a male patient weighing 60 kg. If the apparent volume of distribution is 0.6 L/kg and the elimination rate constant is 0.2 h^{-1} , what dosing interval is needed to achieve an average plasma concentration of 5 mg/mL using 500 mg capsules? (Assume bioavailability is 0.9 and salt factor is 0.8)

12 hours

10 hours

8 hours

6 hours

46- Which of the following equations is used to calculate the plasma concentration of a drug after a single oral dose?

$$C = C_0 \left(\frac{Ka}{Ka - K} \right) (e^{-kt} - e^{-kat})$$

$$C = C_0 \left(\frac{K - Ka}{Ka} \right) (e^{-kt} - e^{-kat})$$

$$C = C_0 \left(\frac{Ka}{Ka - K} \right) (e^{-kat} - e^{-kt})$$

$$C = C_0 \left(\frac{Ka - K}{Ka} \right) (e^{-kat} - e^{-kt})$$

47- Approximately..... percent of total surface area of intestinal epithelium is responsible for paracellular drug absorption.

0.01

0.1

1

10

48- After systemic absorption, ... exists between the concentration of the drug in blood plasma and the concentration of the drug at the site of action.

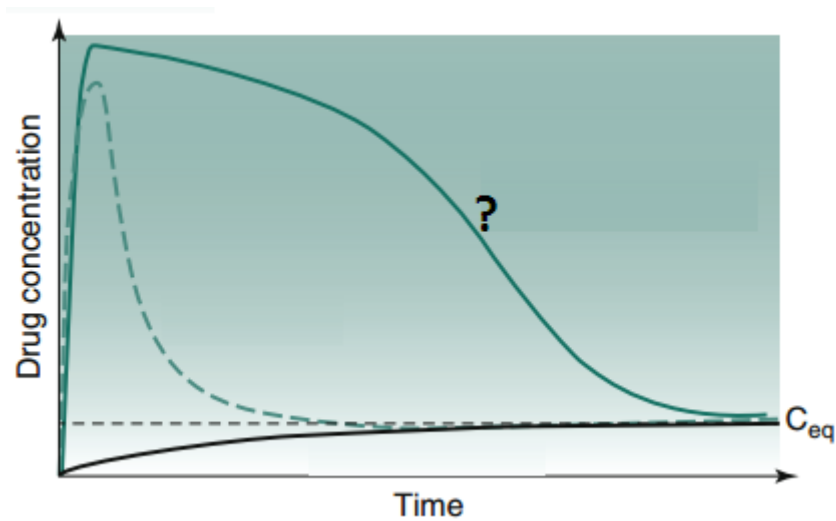
Equal gradient

Equal concentration

Physiological equilibrium

Dynamic equilibrium

49- Which concept is illustrated in the figure (?) for improving drug bioavailability?



Spring

Spring + parachute

Crystalline drug

Amorphous

50- Which of the statements is incorrect?

Propulsive contractions that are being associated with the aboral movement of the contents occur only three to four times daily in normal individuals.

The propulsive contractions are due to contractions of the longitudinal muscle

Segmental contractions are brought about by contraction of the circular muscle

The mass movement which occur approximately every 25 minutes and serve to mix the luminal contents, and result in only small aboral movements.

Pharmacognosy

51- Which ergot alkaloid is used for migraine?

Methyl ergonovine

Ergotamine

Ergocristine

Ergocornine

52- Ajmaline is used for treatment of which disease?

Diabetes

Seizure

Bacterial infections

Cardiac arrhythmia

53- Which one is the biosynthetic precursor for the basic structure of indol alkaloids?

Tyrosine

Glycine

Tryptophan

Phenyl alanine

54- Pilocarpine, active alkaloid of Pilocarpus jaborandi, is accumulated in which part of the plant?

Leaf

Seed

Stem

Root

55- The leaves of which herb contains hydroquinone derivatives?

Capsicum

Bearberry

Hamamelis

Vitex

56- Which one contains higher amount of ellagitannins?

Pomegranate

Catechu

Kinos

Rhatany

57- Furanocoumarins have been distributed in which plant family?

Apiaceae

Brassicaceae

Euphorbiaceae

Fumariaceae

58- Cade oil obtains from which part of *Juniperus oxycedrus*?

Fruit

Flower

Leaf

Wood

59- Which one is the major component of *Illicium verum* (star anise) fruit?

Anethole

Borneol

Carvacrol

Anisaldehyde

60- Which plant essential oil has α - and β - thujone?

Metha piperita

Origanum vulgare

Salvia officinalis

Thymus vulgaris

61- Which compound is responsible for odor of thyme essential oil?

Linalool

Borneol

Eucalyptol

Thymol

62- Which genus is known as source of lanatoside C?

Strophanthus

Digitalis

Nerium

Convallaria

63- Which of the below compounds is a triterpenoid saponin?

Glycyrrhizin

Diosgenin

Solanidin

Cichoridin

64- Which oil is used for treatment of atopic eczema and rheumatoid arthritis?

Olive

Castor

Sweet almond

Evening primrose

65- Which gum dose contain galactomannan as major component?

Tragacanth

Gum Arabic

Guar

Sterculia

66- Which algae is used as source of agar?

Red

Green

Blue-green

Brown

67- Which one has shown anti Taenia worm effect?

β -iron

α -santonin

β -caryophyllene

Gossypol

68- Which one has hepatoprotective effect?

Chicory

Fish berries

Orris

Arnica

69- Iridoids belongs to which class of compounds?

Monoterpenes

Sesquiterpenes

Diterpenes

Triterpenes

70- Which plant contains of gumresin as major compound?

Garcinia hanburii

Pistacia lentiscus

Tetraclinis articulata

Eriodictyon californicum

Clinical pharmacy

71- A patient presents with cough, dyspnea, and sputum production. Suspecting pneumonia, which of the following is more effective in treating pneumococcal infections?

Cotrimoxazole

Cloxacillin

Levofloxacin

cefixime

72- A 46-year-old male patient is hospitalized with peritonitis caused by *Enterococcus faecalis*. Which of the following is the most appropriate treatment?

Cefepime

Clindamycin

Ampicillin-sulbactam

Ertapenem

73- Which of the following signs and symptoms in a patient with urinary symptoms does most strongly suggest acute pyelonephritis?

Fever

Dysuria

Urinary frequency

Discolored urine

74- Which of the following is NOT a characteristic of fosfomycin in UTI treatment?

Its gastrointestinal absorption is less than 50%

It has a complete urinary excretion

It has higher efficacy than nitrofurantoin and cotrimoxazole

It has minimal side effects

75- Which of the following agents is recommended for co-administration with topical antibiotics for acne to reduce the risk of microbial resistance?

- Oral Isotretinoin
- Syetamic antibiotics
- Topical azelaic acid
- Topical benzoyl peroxide

76- A 32-year-old man presents with limited scalp psoriatic lesions on the scalp, accompanied by itching. Which of the following is the most appropriate treatment?

- Calcipotriol cream
- Phototherapy plus psoralen
- Oral methotroxate
- Coal tar shampoo

77- A 65-year-old male patient has the following lipid profile. Assuming no other risk factors or comorbidities, what is the initial pharmacologic intervention to manage his cholesterol level?

Total Chol. 310 mg/dL

LDL-Chol. 240 mg.dL

HDL-Chol. 30 mg/dL

TG 180 mg/dL

- Initiation of statin therapy with low-intensity dosing
- Initiation of statin therapy with moderate-intensity dosing
- Initiation of statin therapy with high-intensity dosing
- Considering the absence of risk factors, adherence to dietary and lifestyle modifications alone is sufficient for treatment

78- Which of the following side effects is more common with PCSK9 inhibitors?

- Angioedema
- Injection site reaction
- Visual disturbances
- Hemolytic anemia

79- In patient receiving warfarin, an INR= 6.5 alongside bleeding is reported. Which of the following interventions is not recommended for this patient?

- Discontinuation of warfarin
- Infusion of Vitamin K
- Administration of PCC (prothrombin complex concentrate)
- Administration of Oral vitamin K

80- Which of the followings is not correct for management of HIT (heparin induced thrombocytopenia)?

- Discontinuation of Heparin as soon as possible
- Switching to enoxapaprin
- Switching to argotraban
- Heparin should not be administered up to 3 months

81- Which of the following drug regimens is recommended in a patient with the stage C of HFrEF (heart failure with reduced ejection fraction)?

- Enalapril, sacubitril, spironolactone
- Furosemide, valsartan, sacubitril
- Valsartan, bisoprolol, spironolactone
- Furosemide, valsartan, empagliflozin

82- A 23-year-old female presents with fatigue and weakness. Her lab results are as follows:

- Hb: 8.4 mg/dL (normal: 12–16)
- MCV: 70 fL (normal: 80–100)
- Reticulocyte count: 0.1% (normal: 0.5–1.5)
- Serum ferritin: 9 ng/mL (normal: 12–150)

Which diagnosis is most likely?

- Beta-thalassemia minor
- Iron-deficiency anemia
- Anemia due to folate or vitamin B12 deficiency
- Anemia of chronic disease or malignancy

83- Regarding the treatment of iron-deficiency anemia, which option is correct?

- Ferrous glycine is the salt of choice due to better absorption and fewer side effects.
- Sustained-release iron formulations are the first-line treatment due to their suitable absorption.
- Gastrointestinal side effects of iron (except constipation) are dose-dependent.
- Oral iron taken with proton pump inhibitors (PPIs) increases gastrointestinal absorption.

84- Which of the following statements is incorrect about side effects of chemotherapeutic agents?

Asparaginase : Hypersensitivity reactions

Vincristine : Peripheral neuropathy

Doxorubicin : Cardiomyopathy

Cisplatin : Pancreatitis

85- Which of the following statements is correct about teriparatide?

It stimulates bone formation and osteoblast regeneration.

It is recommended to be co-administered with bisphosphonates for better efficacy.

Hypocalcemia is one of its side effects.

It is recommended as first-line therapy for osteoporosis in postmenopausal women.

86- A 65-year-old patient with stable angina receiving ASA and Atorvastatin suffers from recurrent angina attacks. Which of the following is recommended as the key drug to control patient's symptoms?

Diltiazem

Isosorbide dinitrate

Metoprolol

Nicorandil

87- A 58-year-old patient with diabetes type 2 and hypertension has referred to physician. Blood pressure 152/95 mmHg is detected at office. Lab data shows mild albuminuria. Which of the following drugs is the best primary selection for his hypertension management?

Amlodipine

Hydrochlorothiazide

Losartan

Metoprolol

88- A 62-year-old man with uncontrolled hypertension and heart failure (EF=30%) has referred to physician with dyspnea on exertion and lower extremities edema. Which of the followings is not an appropriate selection for his hypertension management?

Carvedilol

Diltiazem

Spironolactone

Losartan

89- A female patient aged 42 yrs. has received a new medication for her diabetes type 2. One month later, she complains of polyuria, persistent thirst, and recurrent vaginal fungal infections. Which of the following drugs is the most suspected agent for these adverse reactions?

Metformin

Acarbose

Empagliflosine

Gliclazide

90- A 54-y/o man who recently diagnosed as diabetes mellitus and FBS=185 mg/dl and HbA1C=10.4 is referred to his doctor. Which of the followings is the best approach in this stage?

- Starting metformin monotherapy
- Starting metformin plus another second oral agent
- Starting metformin plus insulin
- Starting gliclazid monotherapy

91- A 31 years old female patient complains of vaginal discharge and itching. Physical exams show un-usual yellow-greenish vaginal discharge with bad smell (pH=6.0), as well as red spots on the inner layer of vagina. Which of the following regimens is considered as the first choice for this patient?

- Oral tinidazole 2 g as a single dose
- Oral Metronidazole 2 g/day, for 5 days
- Oral metronidazole 500 mg bd, for 7 days
- Oral tinidazole 1 g/day, for 5 days

92- Patient is a 3-y/o child with history of a 3-month otitis media, unresponsive to co-amoxiclav, cefuroxime and azithromycin. Which of the followings is recommended for the treatment of current episode?

- Cephalexin
- Cotrimoxazole
- Metronidazole
- Clindamycin

93- A physician calling the pharmacy department and asking about treatment option for a patient with acute bacterial sinusitis and history of gastrointestinal intolerance following treatment with coamoxiclave. What is your recommendation for this patient?

Ciprofloxacin

Cotrimoxazole

Levofloxacin

Azithromycin

94- Which of the followings is recommended for a 69-y/o patient without any past medical history, who is admitted to the hospital with diagnosis of CAP?

Parenteral Azithromycin

Azithromycin + Ceftriaxone

Ceftriaxone

Meropenem

95- A 40 years old man who complains of fever, cough, breathing shortness starting from 2 days ago, has presented at the emergency department. In auscultation, crackles are clearly heard at the base of the right lung. Also, the lung sounds are weak. In physical examination, the patient was found oriented and alert. His vital signs are as follows:

T: 37.5 °C BP: 110/70 mmHg HR: 95 beats/min RR: 24 breaths/min

Considering the most possible diagnosis, which option is the best empiric antibiotic for this patient?

Ampicillin/sulbactam

Levofloxacin

Co-amoxiclave

Ceftriaxone

96- Which of the following is the first line agent for prevention of constipation in a pregnant woman?

Psyllium

Senna

Bisacodyl

Polyethylene Glycol

97- Which statement is correct regarding fever in children?

Axillary temp $>37.5^{\circ}\text{C}$ indicates fever

In a one-month-old infant with fever, the clinician should wait 48 hours before further evaluation

Maximum acetaminophen dose is 40 mg/kg/day

Maximum ASA dose is 50 mg/kg/day

98- Which measure is appropriate in a 1.5-year-old child with acute viral gastroenteritis and diarrhea for the past 2 days?

100 ml/kg ORS per each diarrhea episode

Promethazine to control vomiting

Bismuth subsalicylate to control diarrhea

Supplementation with 10–20 mg zinc as daily dose

99- Which one is the treatment of choice for diarrhea caused by carcinoid tumors?

Diphenoxylate

Cyproheptadine

Octerotide

Iodoquinol

100- Which screening test is essential before starting rituximab in a patient with rheumatoid arthritis?

- Latent TB
- Hepatitis B
- Hepatitis C
- Varicella zoster

101- Which one is correct about treatment with glucocorticoids in rheumatoid arthritis?

- High-dose and long-term use are recommended
- Monthly intra-articular injection is recommended for persistence cases
- Only resolve the symptoms but have no impact on the disease course
- High-dose is recommended during disease flare and should be continued until other drugs take effect

102- A 32-year-old woman with Graves' disease is being treated with methimazole 30 mg daily. Four days after starting the medication, she develops itching and a mild skin rash. Which of the following interventions would you recommend for this patient?

- Reduction in the dose of methimazole
- Switching to propylthiourasil
- Continuing methimazole + oral an antihistamine
- Discontinuation of methimazole and replacing with radioactive iodine

103- A 55-year-old woman (weight = 50 kg) with a one-year history of gastroesophageal reflux being treated with pantoprazole 40 mg daily. She is known case of Hashimoto's hypothyroidism receiving levothyroxine 125 mg daily. The patient's latest TFT is as follows:

TSH= 2(0.5-4.5) TT4= 8(4.5-12) TT3= 120 (80-200)

Which of the following statements is correct?

The levothyroxine dose should be reduced to 100 mcg/day.

To keep an hour interval between taking pantoprazole and levothyroxine.

Due to drug interactions, the dose of levothyroxine should be increased to 150 mcg/day.

Due to the patient's TFT, no treatment intervention is required.

104- Which of the following statements does accurately describe the clinical characteristics of peptic ulcer disease?

In gastric ulcer disease, pain typically intensifies following food intake, whereas in duodenal ulcer, the discomfort is often relieved by eating.

In duodenal ulcer disease, pain typically intensifies following food intake, whereas in gastric ulcer, the discomfort is often relieved by eating.

Both in duodenal and gastric ulcers, pain typically intensifies following food intake

Both in duodenal and gastric ulcers, pain typically relieved following food intake

105- Which of the following statements does accurately describe the standard triple therapy regimen for the eradication of *Helicobacter pylori*?

Substituting one PPIs with another has been shown to improve the efficacy of regimens.

The substitution of PPIs with H2-receptor antagonists does not significantly alter the efficacy of the regimen.

Initiation of PPI therapy prior to the three-drug regimen has been shown to enhance overall efficacy.

Administering PPIs twice daily may offer superior therapeutic efficacy compared to a single daily dose.

106- Which of the following biologic agents is exclusively approved for the management of Crohn's disease and NOT indicated for the treatment of ulcerative colitis?

Infliximab

Natalizumab

Vedolizumab

Certolizumab

107- Which of the following drugs dose have the most risk of the withdrawal syndrome?

Venlafaxine

Citalopram

Mirtazapine

Fluoxetine

108- A 40-year old woman with history of diabetes and heart failure, who has recently been diagnosed with major depression. The past drug history of the patient is: valsartan, bisoprolol, empagliflozin, metformin, and linagliptin. Which of the following drugs is the best for her depression management?

Citalopram

Mirtazepin

Doxepin

Sertralin

109- A 35-year-old woman who complains of palpitation, nausea, sweating, dyspnea and fear of death referred to the emergency department. The patient's experience these signs and symptoms from 6 months ago and persistently concerns of recurrence of the above mentioned episodes. This made her isolated from friends and family. Which of the followings is not appropriate for the patient?

Paroxetine

Imipramine

sertraline

Buspirone

110- Which of the followings is the best treatment option for a 40-y/o schizophrenic female (BMI=35 kg/m²) with baseline dyslipidemia?

Olanzapin

Clozapin

Resperidon

Aripiprazole

111- Which of the followings is recommended for the treatment of intractable migraine headache?

Ergotamin-C

Dexamethason

Midazolam

Topiramate

112- Which of the followings is recommended for the prevention of tension-type headache?

Lithium carbonate

Maprotyline

Sertralin

Caffeine

113- Which of the following antiepileptic medications may increase the risk of nephrolithiasis?

Clobazam

Phenytoin

Topiramate

Lacosamide

114- In an epileptic patient in which of the following conditions, disruption of the treatment can cause rebound of the seizure attacks?

Beginning of seizures before 12-y/o

History of seizure due to fever from childhood

History of generalized tonic-clonic seizures

Presence of abnormal EEG during treatment course

115- Which of followings does not have indication in acute asthma attack?

Salbutamol as inhalation

Parenteral aminophylline

Oral prednisolone

Parenteral methylprednisolone

116- Which of the followings is correct about thiotropium bromide?

- It has shorter half-life than that of ipratropium
- It has more positive outcome in COPD treatment than that of ipratropium
- It has more anti-inflammatory effect than that of ipratropium
- It has more duration of action and less affinity to muscarinic type 2 receptor than those of ipratropium

117- Which of following parameters does show small airway obstruction?

- FEV1/FVC
- VC
- FEF25-75 %
- TLC

118- Which of the following opioids does have weaker effect on histamine release?

- Morphine
- Meperidine
- Hydromorphon
- Fentanyl

119- With which of the following drugs, electrolyte disorder has not been reported?

Sevelamer

Calcium carbonate

Magnesium hydroxide

Aluminum hydroxide

120- what is the most common etiology for erythropoietin resistance in CKD patients?

Sepsis

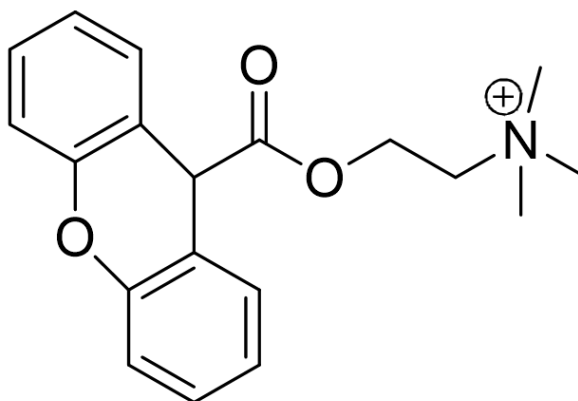
Iron deficiency

Anti-Erythropoietin antibody production

B12 deficiency

Medicinal Chemistry

121- According to the structure, what is the effect of the following compound?



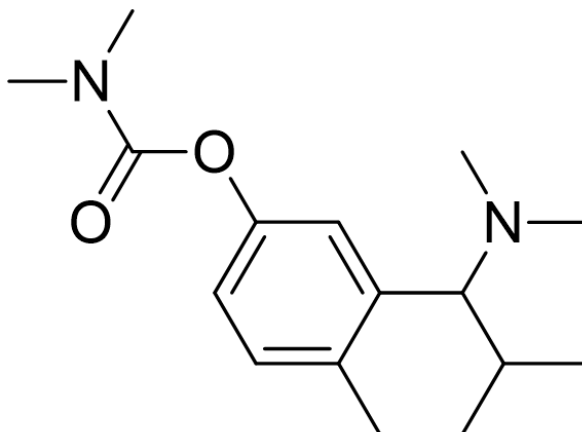
Anti Spasmodic

Anti Glaucoma

Anti Inflammation

Anti Parkinson

122- Which one is the main pharmacological action of the following structure?



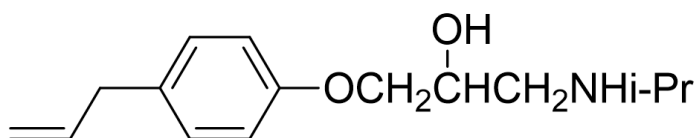
Anti Glaucoma

Anti Myasthenia gravis

Anti Alzheimer

Anti Parkinson

123- According to the structure, what is the effect of the following compound?



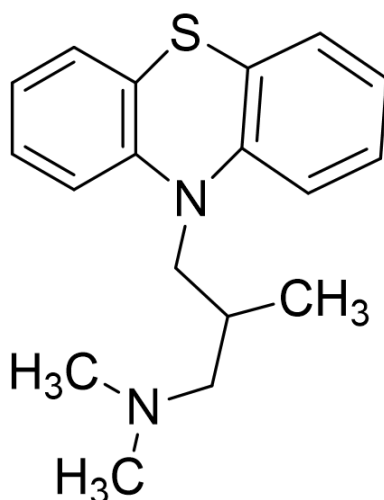
It is a Beta-1 agonist

It is a Beta-2 agonist

It is a Beta-1 antagonist

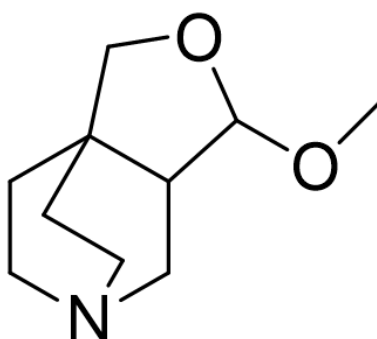
It is a Beta-2 antagonist

124- Which one is the main pharmacological action of the following structure?



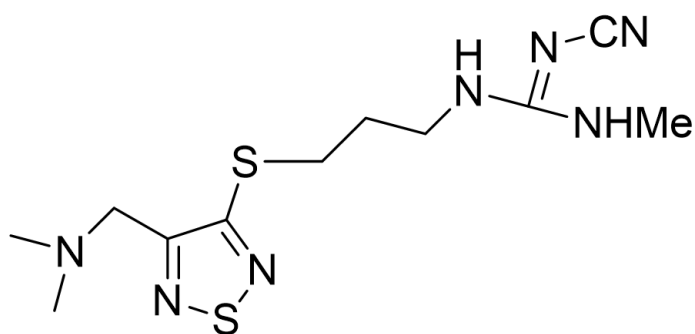
- Anti-ulcer
- Anti- psychotic
- Anti- nociceptive
- Anti- allergic

125- According to the structure, what is the effect of the following compound?



- It is a muscarinic agonist
- It is an acetylcholine esterase Inhibitor
- It is a nicotinic agonist
- It is a muscle relaxant

126- According to the structure, what is the effect of the following compound?



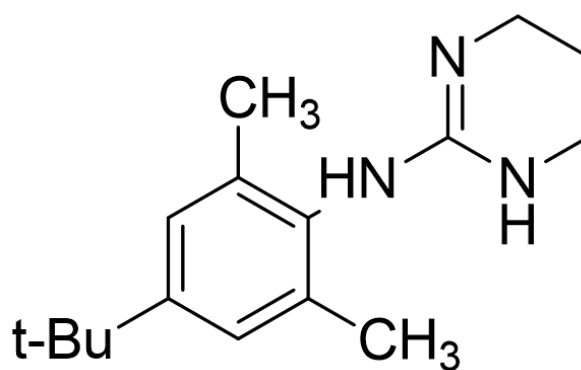
H₁-Agonist

H₂-Agonist

H₁-Antagonist

H₂-Antagonist

127- According to the structure, which one is the mechanism of the following compound?



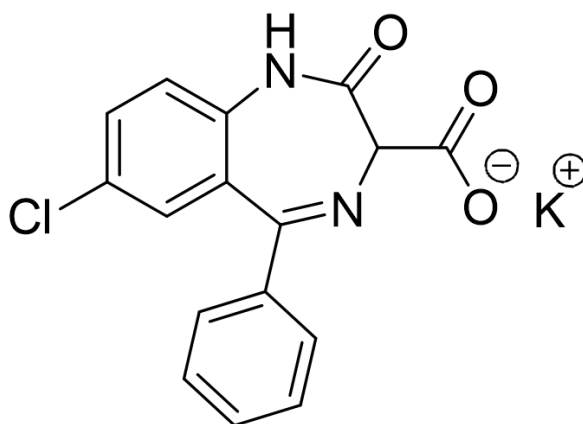
It is a peripheral alpha-1 agonist

It is a central alpha-1 antagonist

It is a central alpha-2 agonist

It is a peripheral alpha-2 agonist

128- What is the main effect of following drug and which one is its active form?



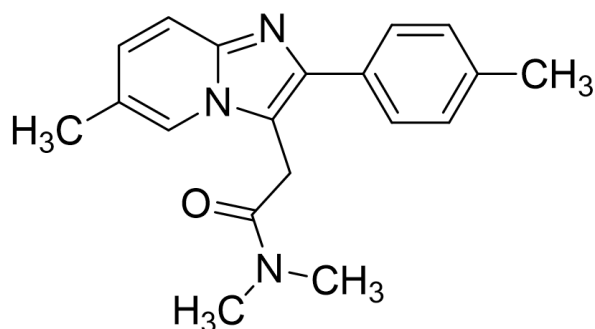
Antidepressant - clordiazepoxide

Anticonvulsant - desmethyldiazepam

Antipsychotic - clordiazepoxide

Antianxiety - oxazepam

129- This drug inhibits ... receptors and acts as



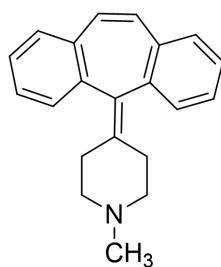
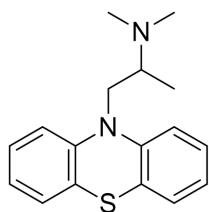
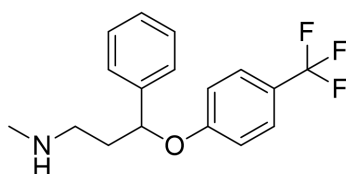
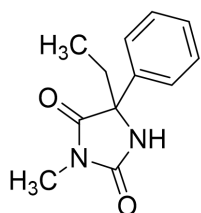
Melatonin - hypnotic

Dopamine – antipsychotic

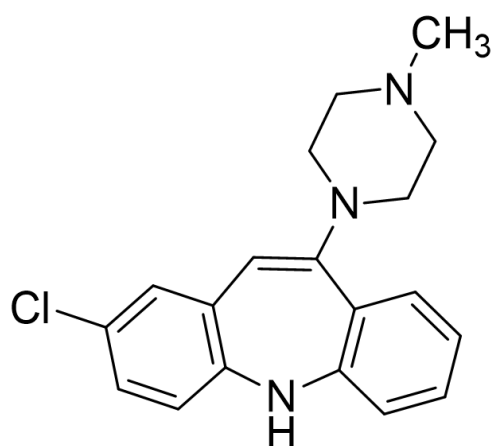
Benzodiazepine - hypnotic

Serotonin - antianxiety

130- Which compound is an antidepressant drug?



131- According to the following structure, which one is incorrect



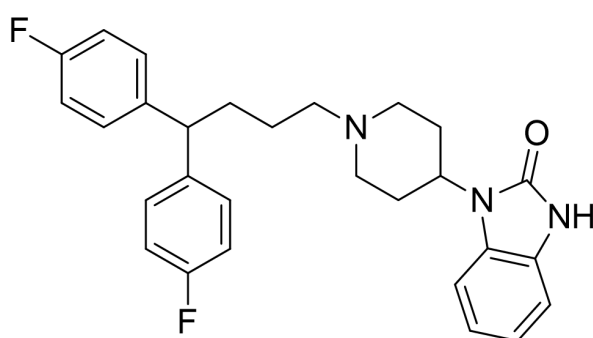
has alkaline property.

has antipsychotic effect

has a methylpiperazine residue

has a benzodiazepine nucleus

132- This drug is used for the treatment of ...



Allergy

Psychosis

Anxiety

Epilepsy

133- Which morphine metabolite is more active than its parent compound?

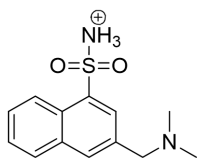
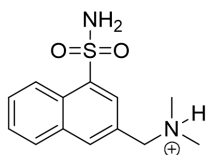
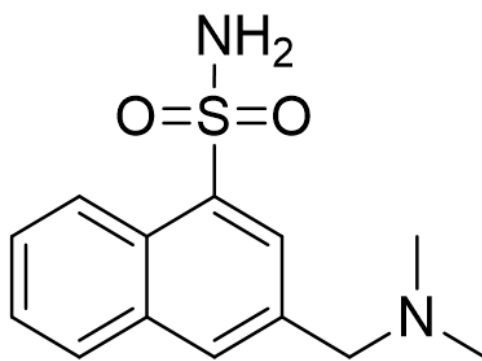
Morphine-3-glucoronide

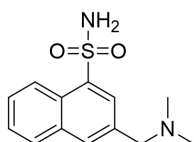
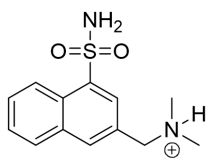
Morphine-6-glucoronide

17-N-demethyl morphine

Codeine

134- Which structure is dominant form of this compound in gastric media?





135- In which family conversion of μ agonist to μ antagonist cannot be accomplished by bulky group substitution?

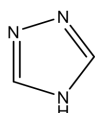
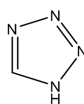
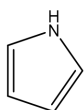
Morphines

Morphinanes

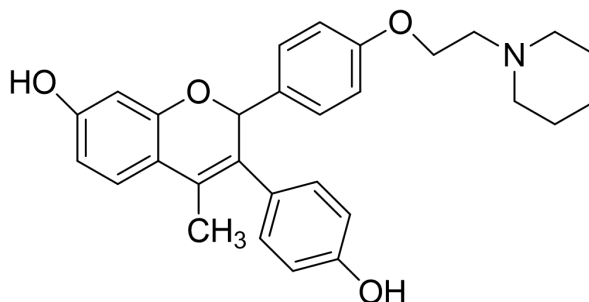
Anilidopiperidines

Oripavines

136- Which one is better candidate for bioisosteric replacement for carboxylic acid?



137- What is the most important clinical application of following compound?



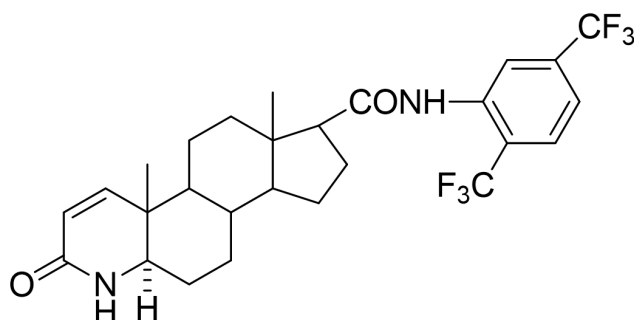
It is an NSAID used in the treatment of Rheumatoid arthritis

It is used in the treatment of Atrophy of vagina

It is used in the treatment of breast and uterus cancers

It is used in the treatment of pregnancy related symptoms

138- Regarding to its mechanism of action, what is the most important clinical application of following compound?



5α-reductase inhibitor in the treatment of benign prostate hyperplasia

Thyroid peroxidase inhibitor in the treatment of hyperthyroidism

17α-hydroxylase inhibitor in the treatment of male hypogonadism

LHRH agonist in the treatment of acne in youth male

139- Regarding to the structure, which of the following is correct?

pyroGlu-His-Trp-Ser-Tyr-D-Ser(t-but)-Leu-Arg-Pro-NH-NHCO-NH₂

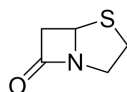
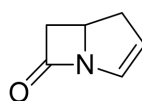
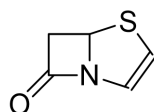
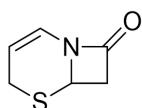
It is a Nona-peptide used as oral contraceptive agent.

It is a Nona-peptide used as muscles building after sever burning.

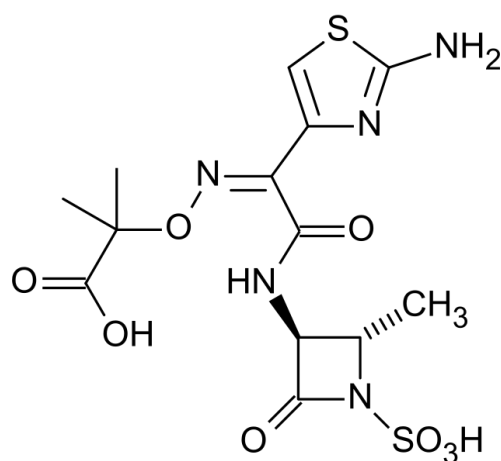
It is a dopamine agonist used in stimulating the production of breast milk in mothers with newborn.

It is a GnRH analogs used in the treatment of endometriosis.

140- At identical situation which structure has more potent transpeptidase inhibitory activity?



141- Which one is incorrect regarding the following compound?



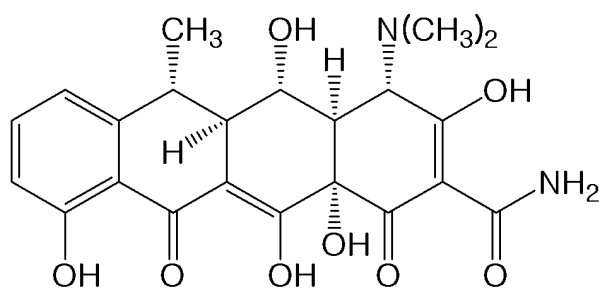
Methyl group on monobactam ring is effective on beta-lactamase resistance

2-aminothiazole ring facilitates drug entrance into gram negative bacteria

Sulfonic acid can be replaced with chloro

Alkoxim group on alpha carbon is effective on beta-lactamase resistance

142- Which one is incorrect regarding tetracycline



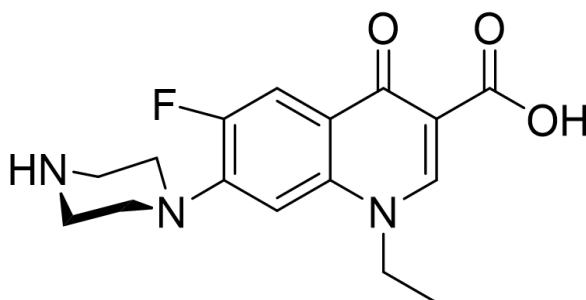
Electron withdrawing group at 7 position reduces potency

Hydroxyl group at 6 position increases potency

Glycyldiamido group at 9 position does not reduce drug binding to ribosome

Electron donating group at 7 position increases potency

143- How can we increase the potency of the following compound?



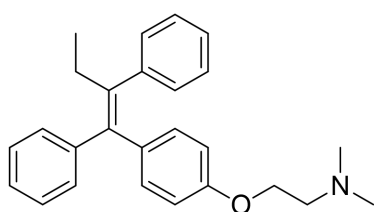
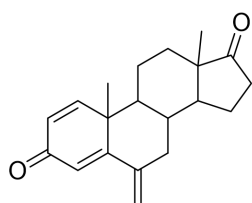
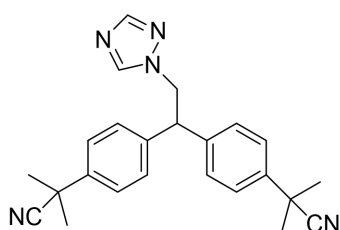
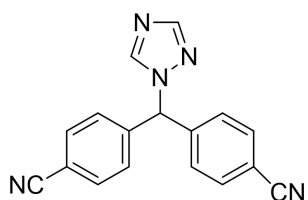
Replacing cyclopropyl by ethyl

Methylation of piperazine ring

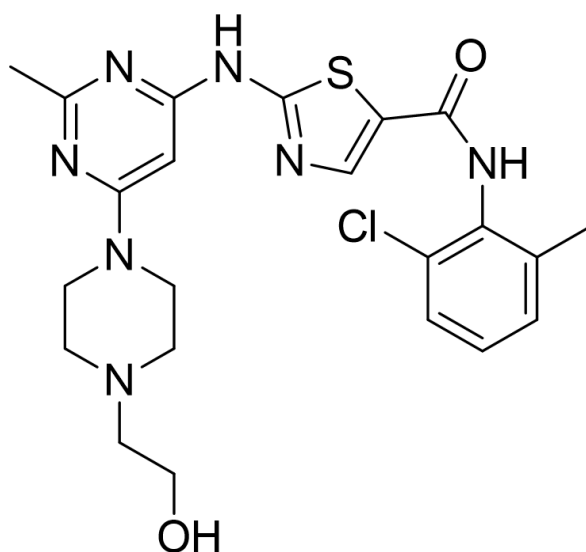
Methyl at 8 position

Replacing amide for carboxylic

144- Which one is not aromatase inhibitor?



145- Which one is anticancer mechanism of the following compound?



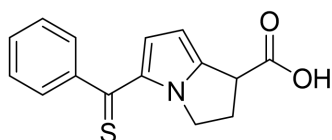
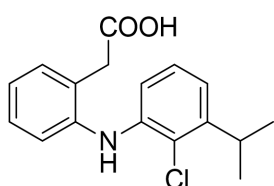
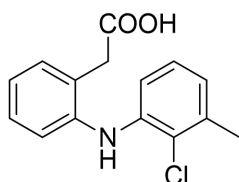
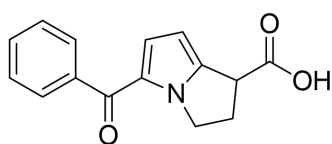
Kinase inhibitor

Alkylating agent

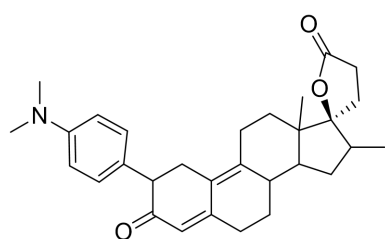
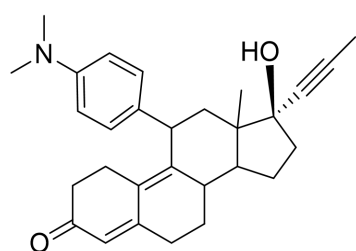
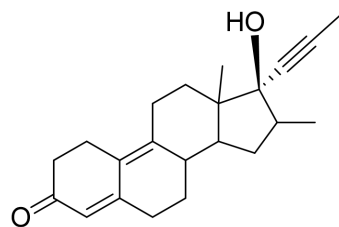
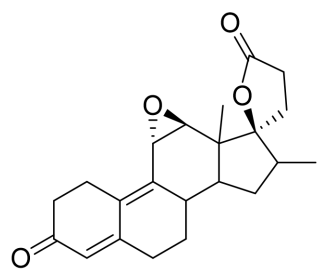
antimetabolite

immunomodulator

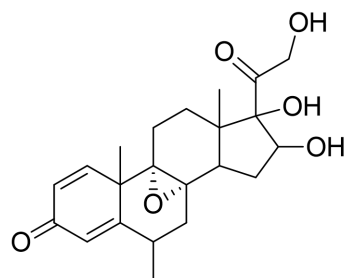
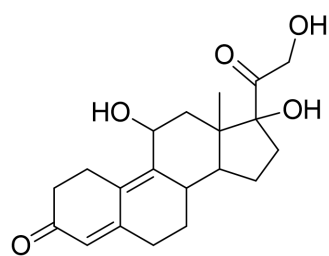
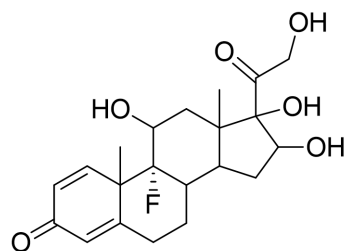
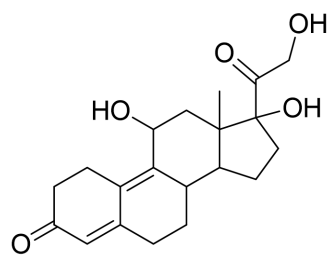
146- Which propionic acid possesses higher cyclooxygenase inhibitory activity?



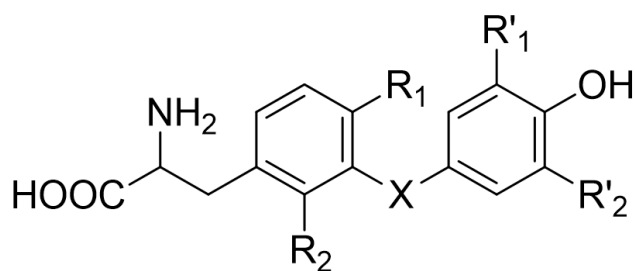
147- Which compound is glucocorticoid receptor antagonist?



148- Which glucocorticoid possesses higher sodium excretion?



149- Which compound cannot activate Thyroid hormone receptor?



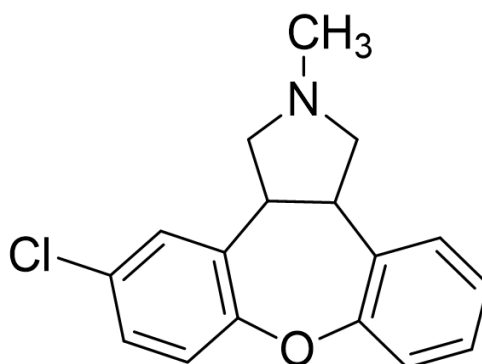
R1=R2=I, R'1=iPr, R'2=H, X=C

R1=R2=Br, R'1=H R'2=iPr, X=O

R1=R2=iPr, R'1=Br, R'2=H, X=O

R1=R2=Me, R'1=iPr, R'2=H, X=C

150- What is the most important clinical application of following compound?



Anti-Psychosis

Anti- Epilepsy

Anti-Parkinson

Anti-Alzheimer

Toxicology & Pharmacology

151- Which of the following drugs is used to treat myasthenia gravis?

Edrophonium

Tolterodine

Bethanechol

Neostigmine

152- Which of the following best describes the concept of "spare receptors"?

Receptors that are not involved in drug binding

Receptors that are present in excess and not all need to be occupied to produce a maximal response

Receptors that are permanently activated

Receptors that are located outside the cell membrane

153- Which of the following is an example of a drug that exhibits capacity-limited elimination?

Theophylline

Amoxicillin

Gentamicin

Phenytoin

154- What is the primary difference between muscarinic and nicotinic receptors

Nicotinic receptors are ion channels, while muscarinic receptors are G protein-coupled

Muscarinic receptors are ion channels, while nicotinic receptors are G protein-coupled

Both receptor are ion channels

Both receptor are G protein-coupled receptors

155- Which subtype of muscarinic receptor is primarily located in the heart and mediates decreased cAMP levels?

M1

M2

M3

M4

156- Which adrenergic receptor subtype is primarily responsible for vasodilation in skeletal muscles?

α_1

α_2

β_1

β_2

157- Which analog of GABA is an inhibitor of GABA transaminase and use for treatment of infantile spam?

Thiagabine

Lacosamide

Vigabatrin

Topiramate

158- Which main factor determines the speed of induction with inhaled anesthetics?

- Blood:gas partition coefficient
- Patient's age
- Concentration of the anesthetic
- Time of day

159- Which of the following drugs is an orexin antagonist used for sleep disorders?

- Zaleplon
- Suvorexant
- Ramelteon
- Eszopiclone

160- Which drug in combination with sacubitril is used for the treatment of heart failure?

- Olmesartan
- Losartan
- Telmisartan
- Valsartan

161- Which drug has clinical use for treatment of insulinoma?

- Sodium nitroprusside
- Fenoldopam
- Diazoxide
- Minoxidil

162- Which molecule dephosphorylate the MLCK (PO4)?

cGMP

cAMP

ROCK

PDE

163- Which drug inhibits the late sodium channels in heart cells?

Trimetazidine

Ivabradine

Nicorandil

Ranolazine

164- Which molecule is more inhibited by milrinone?

PDE1

PDE2

PDE3

PDE4

165- Which drug has the lowest half life?

Adenosine

Amiodarone

Mexilethine

Dronedarone

166- Which drug does not inhibit carbonic anhydrase?

Dichlorphenamide

Methazolamide

Metolazone

Brinzolamide

167- Which drug inhibit JAK1 and is used in the treatment of alopecia areata?

Adalimumab

Baricitinib

Omalizumab

Belimumab

168- Which anticancer drug is a selective microtubule inhibitor?

Dacarbazin

Bleomycin

Eribulin

Irinotecan

169- Which of the following antivirals is a neuraminidase inhibitor used for influenza?

Oseltamivir

Acyclovir

Lamivudine

Ganciclovir

170- Which of the following is side effect of octreotide?

Diarrhea

Reduced endocrine and exocrine pancreatic activity

Hypercalcemia

Bone fractures

171- Which of the following antidepressant is known for its rapid onset of action in treatment-resistant depression?

Fluoxetine

Sertraline

Esketamine

Venlafaxine

172- Which opioid receptor subtype is primarily responsible for analgesia and respiratory depression?

Delta (δ)

Kappa (κ)

ORL1

Mu (μ)

173- Which of the following antitrombine drug acts as an indirect anticoagulant?

Warfarin

Dabigatran

Heparin

Rivaroxaban

174- Which of the following side effect is most commonly associated with niacin therapy?

Myopathy

Warm sensation

Constipation

Hyperuricemia

175- What is the main difference between non-selective COX and COX-2 selective inhibitors?

COX-2 inhibitors have fewer gastrointestinal side effects

non-selective inhibitors are more effective in reducing pain

non-selective inhibitors are used for long-term treatment

COX-2 inhibitors are more likely to cause bleeding

176- Which of the following drugs inhibit thyroid peroxidase and blocks iodine organification?

Levothyroxine

Methimazole

Propranolol

Liothyronine

177- Which of the following is a side effect of spironolactone?

Hypokalemia

Hypoglycemia

Hypertension

Gynecomastia

178- Which antifungal drug is known for its broad spectrum of activity but also for its significant nephrotoxicity?

Fluconazole

Amphotericin B

Flucytosine

Terbinafine

179- Which of the following is a long-acting insulin analog?

- Lispro
- Aspart
- Degludec
- Regular insulin

180- What is the basis of the synergy of penicillins and vancomycin with aminoglycosides?

- Increase of peptidyl transferase activity in cell wall synthesis.
- Inhibition of renal excretion of aminoglycosides.
- Enhancement of active transport of aminoglycosides across the cell membrane into the cytoplasm.
- Interaction with protein binding of aminoglycosides.

181- Which of the following choices is NOT the reason for Sulfonamide resistance in bacteria?

- mutation that cause efflux of Sulfonamides via pg-proteins.
- mutation that cause overproduction of PABA.
- mutation that cause production of a folic acidsynthesizing enzyme that has low affinity for Sulfonamides.
- mutation that impair permeability to the Sulfonamide.

182- Which of the Fluoroquinolones is NOT effective in urinary tract infections due to low urinary levels?

- Norfloxacin
- Moxifloxacin
- Ciprofloxacin
- Levofloxacin

183- Which of the following antibiotics increases blood concentration of phenytoin and carbamazepine?

Rifampin

Amikacin

Ciprofloxacin

Isoniazid

184- Which of the following antibiotics should not be orally administered along with divalent and trivalent cations?

Penicillins

Sulfonamides

Fluoroquinolones

Aminoglycosides

185- What is the antidote for metals such as arsenic?

BAL (Dimercaprol)

Naloxone

Atropine

Flumazenil

186- Treatment of organophosphorous poisoning with atropine, is an example of which kind antagonistic effect?

- Chemical
- Functional
- Dispositional
- Receptor

187- Exposure to a toxic substance for a duration of 1-3 months is classified as:

- Acute
- Subacute
- Subchronic
- Chronic

188- What is the main indication of succimer as an antidote against toxic agent?

- Lead
- Arsenic
- Aluminium
- Cadmium

189- What is the toxicity mechanism of tetrodotoxin?

- Stimulation of chloride channel
- Stimulation of calcium channel
- Inhibition of potassium channel
- Inhibition of sodium channel

190- Which medicine with dual effects on β -oxidation inhibition and VLDL secretion is generally steatogenic?

Aspirin

Tetracycline

Penicillin G

Acetaminphen

191- Which isoenzyme induction by ethanol increase carbon tetrachloride toxicity?

CYP2E1

CYP2D6

CYP3A4

CYP3A2

192- Why NSAIDs consumption induce acute renal injury?

Vasodilation of renal vessels by increasing prostaglandin levels

Decreasing renal blood flow due to prostaglandin synthesis inhibition

Inhibition of angiotensin II production in renal tissues

Induction bradykinin production in the renal

193-Where is primary cellular target of Chloroform induced cellular damage in kidneys?

Proximal tubules

Henle loop

Distal tubules

Collecting duct

194-What is the most sensitive organ to Uranium toxicity?

Skin

Liver

Kidneys

Central Nervous System

195-Which of the following choices induces the highest level of neurotoxicity?

Organic mercury and mercury vapors

Organic mercury and mineral mercury

Mineral mercury and metal mercury

Mineral mercury and mercury vapors

196-In ethylene glycol poisoning which body organ experiences the most damages?

Lungs

Liver

CNS

Kidney

197- Which is the most important metabolic pathway for Ethanol?

Alcohol dehydrogenase

CYP 2E1

Catalase

Glutathione peroxidase

198- All the following methods regarding application of N-Acetyl cysteine in management of Acetaminophen poisoning is correct, except:

140 mg/kg Loading oral dose

150 mg/kg Loading IV dose

150 mg/kg Loading oral dose

70 mg/kg Maintenance oral dose

199- In which of the following poisonings, application of activated charcoal is advised?

Phenobarbital

Lead

Methanol

Lithium

200- All the following compounds can inhibit the mitochondrial electron transfer chain, except:

Rotenone

Cyanide

Azide

Picrotoxin