BP601T. MEDICINAL CHEMISTRY – III (Theory)

45 Hours

ope: This subject is designed to impart fundamental knowledge on the structure, emistry and therapeutic value of drugs. The subject emphasis on modern hniques of rational drug design like quantitative structure activity relationship SAR), Prodrug concept, combinatorial chemistry and Computer aided drug sign (CADD). The subject also emphasizes on the chemistry, mechanism of tion, metabolism, adverse effects, Structure Activity Relationships (SAR), erapeutic uses and synthesis of important drugs.

jectives: Upon completion of the course student shall be able to

Understand the importance of drug design and different techniques of drug sign.

Understand the chemistry of drugs with respect to their biological activity.

Know the metabolism, adverse effects and therapeutic value of drugs.

Know the importance of SAR of drugs.

Course Content:

udy of the development of the following classes of drugs, Classification, echanism of action, uses of drugs mentioned in the course, Structure tivity relationship of selective class of drugs as specified in the course id synthesis of drugs superscripted by (*)

NIT – I **10 Hours**

ntibiotics

storical background, Nomenclature, Stereochemistry, Structure activity lationship, Chemical degradation classification and important products of the llowing classes.

Lactam antibiotics: Penicillin, Cepholosporins, â- Lactamase inhibitors, onobactams

minoglycosides: Streptomycin, Neomycin, Kanamycin

tracyclines: Tetracycline,Oxytetracycline, Chlortetracycline, Minocycline, oxycycline

NIT – II **10 Hours**

ntibiotics

storical background, Nomenclature, Stereochemistry, Structure activity lationship, Chemical degradation classification and important products of the llowing classes.

acrolide: Erythromycin Clarithromycin, Azithromycin.

iscellaneous: Chloramphenicol*, Clindamycin.

Prodrugs: Basic concepts and application of prodrugs design.

Antimalarials: Etiology of malaria.

Quinolines: SAR, Quinine sulphate, Chloroquine*, Amodiaquine, Primaquine phosphate, Pamaquine*, Quinacrine hydrochloride, Mefloquine.

Biguanides and dihydro triazines: Cycloguanil pamoate, Proguanil.

Miscellaneous: Pyrimethamine, Artesunete, Artemether, Atovoquone.

UNIT – III **10 Hours**

Anti-tubercular Agents

Synthetic anti tubercular agents: Isoniozid*, Ethionamide, Ethambutol, Pyrazinamide, Para amino salicylic acid.*

Anti tubercular antibiotics: Rifampicin, Rifabutin, Cycloserine Streptomycine, Capreomycin sulphate.

Urinary tract anti-infective agents

Quinolones: SAR of quinolones, Nalidixic Acid,Norfloxacin, Enoxacin,

Ciprofloxacin*, Ofloxacin, Lomefloxacin, Sparfloxacin, Gatifloxacin, Moxifloxacin

Miscellaneous: Furazolidine, Nitrofurantoin*, Methanamine.

Antiviral agents:

Amantadine hydrochloride, Rimantadine hydrochloride, Idoxuridine trifluoride, Acyclovir*, Gancyclovir, Zidovudine, Didanosine, Zalcitabine, Lamivudine, Loviride, Delavirding, Ribavirin, Saquinavir, Indinavir, Ritonavir.

UNIT – IV **08 Hours**

Antifungal agents:

Antifungal antibiotics: Amphotericin-B, Nystatin, Natamycin, Griseofulvin.

Synthetic Antifungal agents: Clotrimazole, Econazole, Butoconazole, Oxiconazole Tioconozole, Miconazole*, Ketoconazole, Terconazole, Itraconazole, Fluconazole, Naftifine hydrochloride, Tolnaftate*.

Anti-protozoal Agents: Metronidazole*, Tinidazole, Ornidazole, Diloxanide, Iodoquinol, Pentamidine Isethionate, Atovaquone, Eflornithine.

Anthelmintics: Diethylcarbamazine citrate*, Thiabendazole, Mebendazole*, Albendazole, Niclosamide, Oxamniquine, Praziquantal, Ivermectin.

Sulphonamides and Sulfones

Historical development, chemistry, classification and SAR of Sulfonamides:

Sulphamethizole, Sulfisoxazole, Sulphamethizine, Sulfacetamide*, Sulphapyridine, Sulfamethoxaole*, Sulphadiazine, Mefenide acetate, Sulfasalazine.

Total No. of printed pages = 4

BP 601 T

Roll No. of candidate | | | | | | | | | | |

2022

B.Pharm. 6th Semester End-Term Examination

MEDICINAL CHEMISTRY – III

Full Marks – 75 Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following (MCQ) : (20 × 1 = 20)

(i) Which of these antimalarials is used for the liver stage of the disease?

(a) Artemisinin (b) Chloroquine

(c) Mefloquine (d) Primaquine

(ii) Sodium stibgluconate is used specifically against

(a) Filariasis (b) HIV

(c) Leishmaniasis (d) Sleeping sickness

(iii) Which of these antivirals is used specifically against influenza cases?

(a) Oseltamivir (b) Zidovudine

(c) Acyclovir (d) All of these

(iv) The drug of choice for Filariasis is

(a) DEC (b) Dapsone

(c) Sodium stibgluconate (d) Chloroquine

(v) Which of these drugs is characterized as Z in DOTS therapy

(a) Isoniazid (b) Streptomycin

(c) Pyrazinamide (d) Ethambutol

(vi) Which of these drugs was under investigation for use in COVID-19?

(a) Hydroxychloroquine (b) Ivermectin

(c) Both of these (d) None of these

[Turn over

(vii) The ratio of trimethoprim and sulfamethoxazole in cotrimoxazole is

(a) 5:1 (b) 1:5

(c) 1:4 (d) 4:1

(viii) Apart from TB the drug Rifampicin is also effective in treating?

(a) Whooping cough (b) Measles

(c) Leprosy (d) Septicemia

(ix) Which one of the following concepts in QSAR describes a linear free-energy relationship?

(a) Taft's Equation (b) Hammet's Equation

(c) Hansch analysis (d) None of these

(x) The category of Penicillins that is resistant to Beta-lactamase enzyme is

(a) Methicillin (b) Cloxacillin

(c) Dicloxacillin (d) All the above

(xi) The azabicyclo [4.2.0] ring system is observed in

(a) Penicillin (b) Cephalosporin

(c) Tetracyclin (d) Carbapenams

(xii) Find the odd one out.

(a) INH (b) Ethambutol

(c) Rifampin (d) Azithromycin

(xiii) Which of these heterocyclic ring systems are observed in Nitrofurantoin?

(a) Pyridine and furan

(b) Furan and phenytoin

(c) Furan and hydantoin

(d) Hydantoin and benzimidazole

(xiv) The antifungal drug which forms pores in the fungal ergosterol membrane _____.

(a) Griseofulvin (b) Ketoconazole

(c) Miconazole (d) Amphotericin-B

(xv) Red coloured urine can be observed during the treatment course of which of these drugs?

(a) Chloroquine (b) INH

(c) Telmisartan (d) Rifampicin

(xvi) Which vitamin deficiency is observed in people who take INH for a long time?

(a) Vitamin B_1 (b) Vitamin B_6

(c) Vitamin B_{12} (d) Vitamin B_3

(xvii) Sulfonamides essentially work by binding and inhibiting ————————.

(a) DHPS (b) DHF

(c) THF (d) DPPS

(xviii) Streptomycin is not administered orally because

(a) It causes a metallic taste in the mouth

(b) It causes excessive vomiting

(c) Poor absorbance from stomach

(d) Causes GI bleeding

(xix) Select an anti-hepatitis antiviral drug from among the following

(a) Lamivudine (b) Ribavirin

(c) Interferon alpha (d) All of these

(xx) The Gray baby syndrome is an ADR of

(a) Chloramphenicol (b) Amoxicillin

(c) Ornidazole (d) Cloxacillin

2. Answer any seven questions $(7 \times 5 = 35)$

(a) Write a detailed note on Reverse Transcriptase and mention the viruses which use this process.

(b) Write the classification of antifungal drugs. Mention the structural aspects of Amphotericin B. (3+2)

(c) Write a note on Solid phase and Solution phase synthesis.

(d) Discuss the SAR of 4-aminoquinolines.

(e) Write the synthesis of

(i) Metronidazole

(ii) Chloramphenicol

(f) Write a note on the different types of Anthelmenthic drugs. Write the synthesis of DEC. (3+2)

(g) Discuss the structural features of Tetracycline.

(h) Classify antiviral drugs. Write the synthesis of Acyclovir. (3+2)

(i) Write a note on Urinary tract anti-infective drugs with structural examples.

(j) Describe the SAR of sulphonamides.

3. Answer any two questions $(2 \times 10 = 20)$

(a) Write the synthesis of (any four) $(4 \times 2.5 = 10)$

(i) Chloroquine

(ii) Ciprofloxacin

(iii) Isoniazid

(iv) Dapsone

(v) Sulfacetamide

(vi) Trimethoprim

(b) What is malaria? Discuss the chemical classification of malaria with a few structural examples. Write a note on the structural features of Artemisinin. $(2+5+3 = 10)$

(c) Write short notes on: (any four) $(4 \times 2.5 = 10)$

(i) QSAR

(ii) Combinatorial chemistry

(iii) Hammet's Equation

(iv) Hansch Analysis

(v) Pharmacophore

(vi) Molecular docking

Assam Science and Technology University

B. Pharm 6th Semester, End Term Practical ExaminationJuly 2022

Subject: Medicinal Chemistry III Practical

Time: 4 Hours

Full marks: 35

BATCH A

1. **Synopsis.** **5**
   Discuss about the various types of drug design.
2. **Minor Experiment.** **10**
   Determine the physicochemical properties of the given drugs using Molinspiration software.
3. **Major Experiment.** **15**
   Synthesize triphenylimidazole from benzy and report the yield.
4. **Viva-voce.** **5**

18/07/22

External Signature

18/7/22

Internal Signature

permeability which leads leakage of intracellular compounds such as ions and cellular ion gradient is disrupted. so the organism undergoes cellular damage and death.

Examples – Polymyxin. Polyene antifungal agents. Nystatin. Amphotericin B.

→ INHIBITION OF PROTEIN SYNTHESIS –

Protein synthesis is a complex, multi-step process involving many enzymes and conformational alignment. Certain antibiotics affect the function of 30S and 50S ribosomal subunits to cause reversible inhibition of protein synthesis. It block bacterial protein synthesis interfere with the processes at the 30S subunit or 50S subunit of the 70S bacterial ribosome or certain antibiotics on binding with the 30S ribosomal subunit can alter the protein synthesis which can ultimately lead to cell death.

Examples – Tetracyclines and Aminoglycasides have an affinity for the 30S ribosome subunit

Chloramphenicol and Macrolides have an affinity for the 50S ribosome subunit

→ INHIBITION OF NUCLEIC ACID SYNTHESIS –

Antibiotics can inhibit replication, transcription and folate synthesis of microorganisms. The inhibition of nucleic acid transcription and replication prevents cell division and/or the synthesis of essential proteins. Antibiotics target RNA transcription or DNA replication to prevent new bacteria from being produced must be able to easily diffuse through bacterial membranes.

Examples – Rifamycins, Fluoroquinolones, Metronidazole

→ ANTIMETABOLITE ACTIVITY –

Biological metabolic reactions are catabolized by enzymes that are activated by substrates. Synthesis of metabolic biological compounds can be inhibited by drugs as a competitive inhibition manner. Bacterial metabolism inhibitors are a class of antibiotics that target nucleic acid and amino acid synthesis pathways. Bacteria synthesize their folic acid from the precursor paraaminobenzoic acid. Bacterial metabolism inhibitors affect bacterial metabolic pathways by interfering with the bacterial TH4 synthesis. Examples – Sulphonamides, Trimethoprim

Q what is antibiotics? Give its different MOAs

Ans- Antibiotics are medicines that fight bacterial infections in people and ani... they work by killing the bacteria or by making it hard for the bacte... grow and multiply

One basic mechanism of actions of antibiotic action against Bacte...

1. Inhibition of protein synthesis (Translation)
2. Alternation of cell membranes
3. ~~Syn~~ Inhibition of nucleic acid synthesis
4. Antimetabolite activity

1) Inhibition of cell wall synthesis

-> β-lactams = Inhibition of peptidoglycan synthesis

Resistance - fail to cross membrane
fail to bind to altered PBP

-> Vancomycin = Disrupts peptidoglycan cross-linkage

Resistance - fail to cross gram-ve other membrane some intrinsically resistants.

2) Inhibition of protein synthesis (Translation)

->30s ribosome site

Aminoglycosides = Irreversibly bind 30s ribosome proteins

Resistance :- decrease uptake

-> 50s ribosome site

Chloramphenicol :- Binds peptidyl transferase component of 50... blocking peptide elongation.

Resistance - Plasmid encoded chloramphenicol transferase
Altered outer membrane

Macrolides - Reversibly bind 50s ribosome, block peptide elong...
(bacteriostatic)

Resistance -> methylation of 23s ribosomal RNA subunit
enzymatic cleavage
active efflux

Alteration of cell m Membrane

Polymyxins = Cationic detergent like activity

Daptomycin = Disrupt cytoplasmic membranes

Anti metabolite activity

Sulfonamides and Dapsone = Complete with P - amino benzoic acid (PABA) preventing folic ā synthesis.

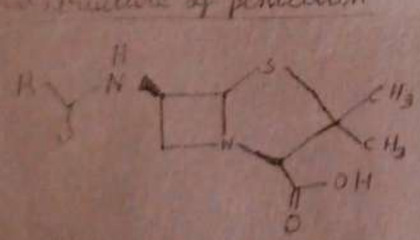
Trimethoprim = Inhibit dehydro folate reductase preventing folic ā

Classification of B - Lactum antibiotics

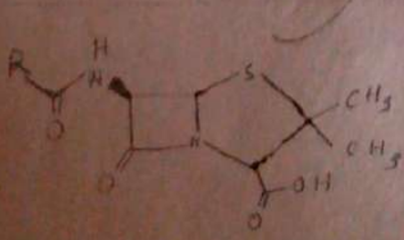
B - Lactum antibiotics

- Penicillins
  - Penicillin G
  - Penicillin V
  - Methicillin
  - Oxacillin
- Cephalosporins
  - 1st generation
    - Ampicillin
    - Cefadroxil
    - Cephapirin
  - 2nd generation
    - Cefazolin
    - Cefonicid
    - Cefotetan
  - 3rd generation
    - Cefaclor
    - Cefixime
    - Cefuroxime
  - 4th generation
    - Cefepime
    - Cefozopran
    - Fosamil
- Carbaphenam
  - Biapenam
  - Ertapenam
  - Doripenam
- Monobactum
  - Aztreonam
  - Carumonum
  - Nocardicin A

General structure of penicillin

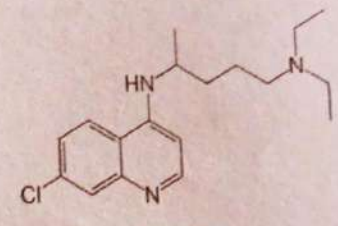


General structure of cephalosporin

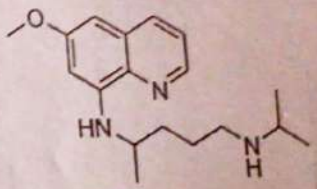


CLASSIFICATION OF ANTIMALARIALS ACCORDING TO STRUCTURE:

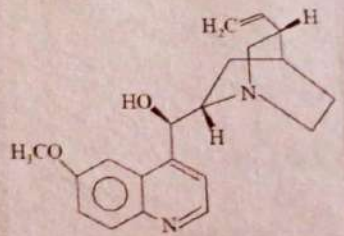
1. **QUINOLINE**
   a) **4-AMINOQUINOLINES:** CHLOROQUINE, AMODIAQUINE.
   b) **8-AMINOQUINOLINES:** PRIMAQUINE, PAMAQUINE
   c) **QUININE DEREIVATIVES**: QUININE, QUINIDINE
2. **ARYL AMINO ALCOHOLS:** MEFLOQUINE, HALOFANTRINE.
3. **DIAMINOPYRIMIDINE:** PYRIMETHAMINE
4. **SULPHONES & SULPHONAMIDES:** SULFADOXINE, DAPSONE



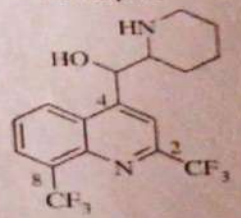
Chloroquine



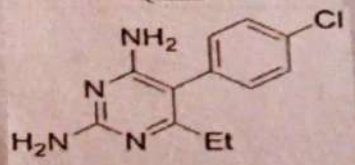
Pamaquine



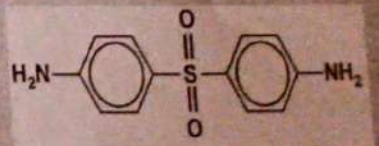
Quinine



MEFLOQUINE (1)

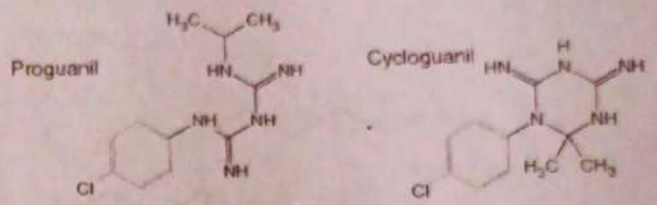


Pyrimethamine (Pyr)

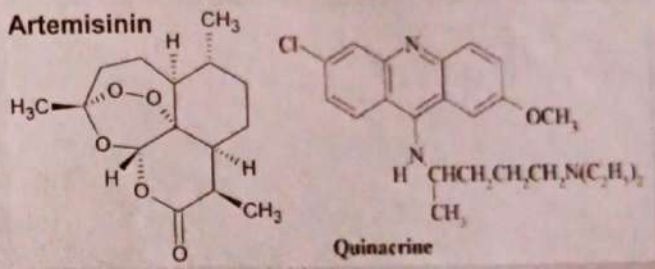


Dapsone

5. **Biguanides:** Proguanil and cycloguanil



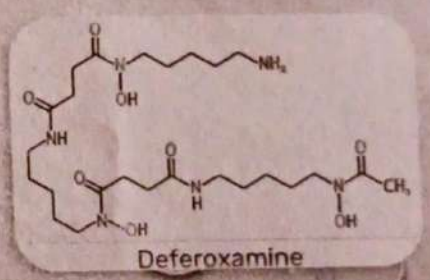
6. **Sesquiterpene lactone endoperoxide:** Artemisinin derivatives and analogues – artemether, arteether, artesunate



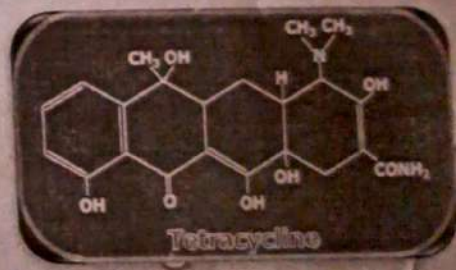
7. **9-aminomacridines:** Quinacrine

8. **Naphthoquinone:** Atovaquone

7. **Iron chelating agents:** Desferrioxamine



8. **Antimicrobials:** Tetracycline, doxycycline, clindamycin, azithromycin



Antifungal agents

Introduction :- Antifungal agents are drugs used for superficial and deep (systemic) fungal infections. A disquietening trend after 1950s is the rising prevalence of more sinister type of fungal infections which are to a large extent, iatrogenic. Fungal infections are mostly associated with the use of broad-spectrum antibiotics, corticosteroids, anticancer drugs, dentures and emergence of AIDS. As a result of breakdown of host defence mechanism by above agents, saprophytic fungi easily invade living tissue.

Many topical antifungals have been available since the antiseptic era. Two important antibiotics — amphotericin B and griseofulvin. Terbinafine is a novel antifungal.

Introduction ANTHELMINTICS

Anthelmintics is the term used to describe a drug used to treat infection of animals with parasitic worms. This includes both flat-worms, example - flukes (trematodes) and tapeworms (cestodes) as well as roundworms (nematodes). The parasites are of huge importance for human tropical medicine and for veterinary medicine.

These drugs mainly treat a condition called helminthiasis (macroparasitic disease of humans and other animals in which a part of body is infected with parasitic worms called helmints).

The drug of choice for soil transmitted helmints are mebendazole and albendazole and for tapeworms it is praziquantal.

Mechanism Of Action: Acts on parasites glutamate-gated Cl^- channel receptors. Chloride influx increased, hyperpolarization occurs, resulting in paralysis of the worms

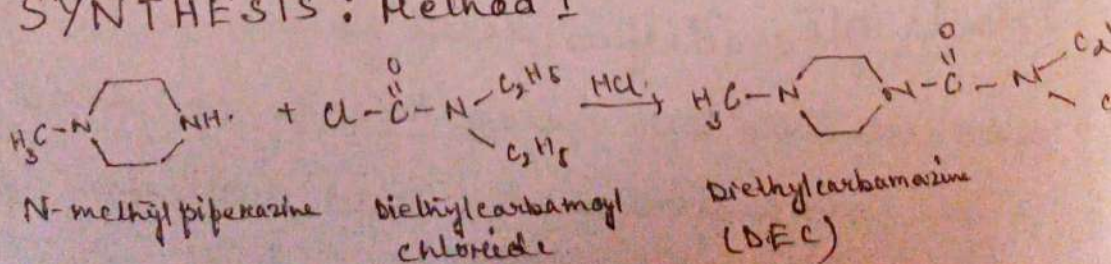
or paralyze nematodes by intensifying GABA-mediated transmission of signal in peripheral nerves.

Classification: Classification of anthelmintic based on chemical structure-

1. Piperazines: Diethylcarbamazine citral (DEC), Piperazine citrate
2. Benzimidazoles: Albandazole, Mebandaz
3. Heterocyclics: Oxamniquine, Praziquinta
4. Natural products: Ivermectine
5. Vinyl pyrimidines: Pyrantel, Oxantal
6. Amide: Niclosamide
7. Nitro derivative: Nitidazole
8. Imidazo-thiazole: Levamisole

DIETHYL CARBAMAZINE CITRATE

SYNTHESIS: Method I



N-methyl piperazine + Diethylcarbamoyl chloride → Diethylcarbamazine (DEC)

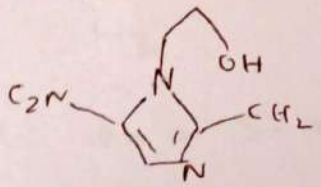
ANTI-PROTOZOAL AGENT

Introduction : Protozoal diseases are categorised as. malaria, amebiasis, giardiasis, trichomoniasis, toxoplasmosis and as a direct consequence of the AIDS epidemic, Pneumocystis carinii pneumonia (PCP). Amebiasis is a disease of the large intestine caused by Entamoeba histolytica which can invade the wall of the colon or other parts of the body. The disease occur mainly in the tropics but it also is seen in temperate climates in which sanitation is poor. The prevalence of amebiasis has been estimated to be as high as 20% of the population. Amebiasis may be carried out without significant symptoms or may lead to severe, life threatening dysentery. The organism exists in one of two forms, the motile trophozoite form or the dormant cyst form. The trophozoite is found in the intestine or wall of the colon

and may be expelled from the body with the stool. They the cyst form is encased by a chitinous wall that protect the organism from the environment, including chlorine used in water purification; thus, the organism may be transmitted through contaminated water and food.

Classification

1. Metronidazole



Metronidazole

(A) Metronidazole is a synthetic 5-nitroimidiazole derivatives with anti-protozoal and anti-bacterial activities.

(B) It is a prodrug and is selective for anerobic bacteria

(C) It is chemically, 2-(2 methyl-5-nitroimidazol-1-yl) ethanol

MICONAZOLE:

Structure:

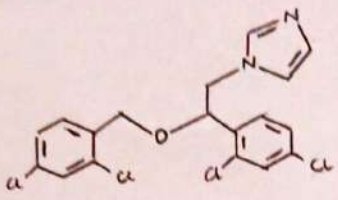
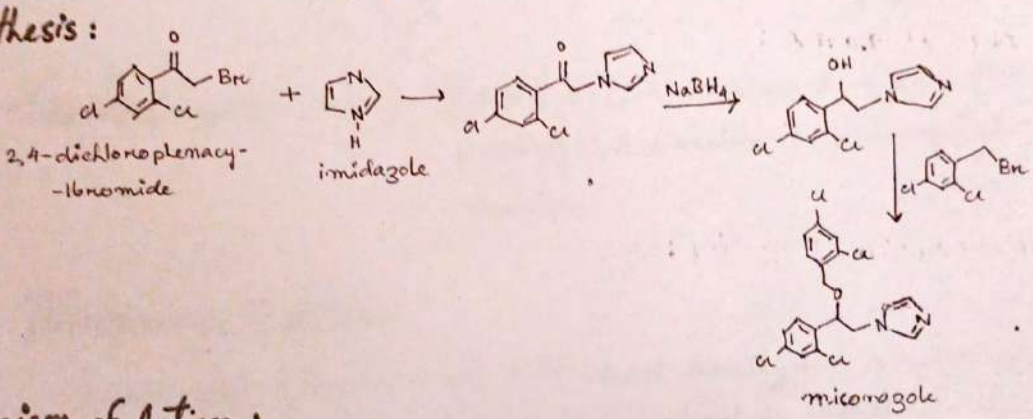


fig: Miconazole

Chemical name: 1-[2-(2,4-dichlorophenyl)-2-[(2,4-dichlorophenyl)methoxy]ethyl]-imidazole

Synthesis:



Mechanism of Action:

Miconazole inhibit the fungal cytochrome P450 enzyme "Lanosterol 14-demethylase" & thus impair ergosterol synthesis leading to a cascade of membrane abnormalities in the fungus. This interfers with the barrier function of the membrane & with membrane-bound enzymes.

Uses:

1. Used in treatment of athlete's foot
2. Used in treatment of jock itch
3. Used in treatment of candidiasis
4. Used in treatment of ring-worm infection.

Ketoconazole:

Structure:

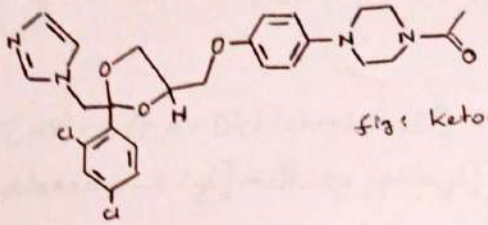


fig: Ketoconazole

Chemical name: 1-[4-[4-[[(2R,4S)-2-(2,4-dichlorophenyl)-2-(imidazol-1-ylmethyl)-1,3 dioxolan-4-yl] phenyl] piperazin-1-yl] ethanone.

Mechanism of Action:

Ketoconazole interacts with 14 α-sterol demethylase, a cytochrome P450 enzyme necessary for the conversion of lanosterol to ergosterol. This results in inhibition of ergosterol synthesis & increased fungal cellular permeability due to reduced amounts of ergosterol present in the fungal cell membrane. This metabolic inhibition also results in accumulation of 14 α-methyl-3,6-diol, a toxic metabolite. The increase in membrane fluidity is also thought to produce impairment of membrane bound enzym systems as components become less closely packed.

Uses:

1. Used to treat skin infection such as athlete's foot, jock itch, ring worm infection
2. Used in treatment of certain kinds of dandruff.
3. Used in treatment of pityriasis.

Name: Jyotibrat Goswami
Roll no: 19051001110037
Sub: Medicinal chemistry III

Q1. Define the 2 terms (2.5+2.5=5)
(i) Lead compound
(ii) Pharmacophore

Q2. Explain the Hansch's equation. (10)

Ans 1

(i) Lead Compounds: It is define as a substance derive from natural or synthetic source which when bind to target receptor / site brings about pharmacological effect. The lead compound is further modified with the help of drug designing methods to formulate formulation with better effect. They have to be design in such a way that they are specific to the target site only & do not interact with other sites similar to the target site.

(ii) Pharmacophore: Pharmacophore is define as the specific three dimensional arrangement of functional group in a molecular compound frame with necessary constituents which helps in binding desired to the target site & showing discreed pharmacological activity. Type are ligand based structure based, Rational drug design, computer aided.

Ans 2 : Hansch's equation :

→ It is a QSAR equation relating to various physiochemical properties to the biological activity of a series of compound.

→ Usually include log P

→ $\log 1/C = k_1\pi - k_2\pi^2 + k_3\sigma + k_4 E_s + k_E$

$1/C$ = conc^n at which effect is available

π = partition coefficient ~~of octa~~ n-octanol in water

σ = Hammet's ~~eq~~ const^n

E_s = taft's const^n

It is a combination of all pharmacokinetic parameters.

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Name - Hrijeet Chetia

B. Pharm 6th Semester

Section - A

R/N - 1905100110034

Med-Chem Practical

Synopsis

Session - II

Q.1/ Define the two terms :- (2.5+2.5=5)

① Head compound

② Pharmacophore

Q2/ Explain the Hansch's equation. (10)

Answers

Ans 1/ ① Lead compound :-

> These compounds are chemical substances derived from either natural or synthetic sources.

> These compounds bind to the target to a single receptor where it shows its pharmacological & therapeutic activity.

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> These compounds are further experimented / modified in accordance to the required drug designing factor to give more pharmacological or therapeutic activity.

> These compounds are further studied to find other drug molecules which may have the same structure & biological activities which may result into finding other new compound.

(ii) Pharmacophore :-

» Pharmacophore is defined as the specific three dimensional arrangements of functional groups in a molecular compound framework with necessary constituents which helps in binding to the target set.

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» Types

- Ligand based.
- Structure.
- Computer aid.
- Rational.

Ans 2 :- HANSCH EQUATION :-

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- It is a QSAR equation relating various physiochemical properties to the biological activity of a series of compounds.
- usually includes logP, electronic & steric factors.
- Typically eqn for a wide range of log P is parabolic

$$\log 1/c = k_1\pi - k_2\pi^2 + k_3\sigma + k_4 E_s + k_5$$

$1/c$ = activity, c = conc of drug reqd to elicit a given response.

π = octanol/water partition co-efficient.

σ = Hammett substituent constant

E_s = Taft steric parameter

Medchem

Name - Kunal Pathak
Roll No - 190 5100 17044
B. Pharm 6th semester
Sec - A

Medicinal Chemistry - III Practical synopsis

Q.1. Define the two terms
i) Lead compound ii) Pharmacophore

Q2. Explain the Hansch's equation. (10).

Ans:- 1. i) Lead compound

Lead compound is a chemical substance derived either natural or synthetic source. They bind to the target site / receptor where they bring about a pharmacological or therapeutic effects. The lead is further experimented on or formulated or modified in accordance to drug designing factor to give more effective results or therapeutic effects. Lead compound is studied to find other drug moieties which may have the same structure and biological activities which may result into finding a new drug compound. Lead compound are specific to a target site only and do not gets bind or interact with other target site.

ii) Pharmacophore

Pharmacophore is defined as the specific three dimensional arrangement of functional group in a molecular compound framework with necessary constituents of pharmacophore which helps in binding to the target set. Types :- Ligand based, structure based, computer aided, rational drug discovery

Ans:- 2. Hansch Equation

- It is a QSAR equation relating to various physicochemical properties to the biological activity of a series of compounds
- Usually eq includes log P, electronic and steric factor
- Typically eqn for a wide range of log P is parabola

$$\log 1/C = K_1 \pi - K_2 \pi^2 + K_3 S + K_4 E_S + K_5$$

- $1/C$ = conc at which effect is available
- π = octanol water partition coefficient
- σ = Hammett substituent const
- E_S = Taft steric parameter

ATTENDANCE LIST

Sub: Medicinal Chemistry III
Semester:6th semester, Sec-B
Sub Teacher: Lima Patowary

Sl. No.	Roll No.	Name	% attendance
1	190510011052	MANASH JYOTI GOSWAMI	91.84
2	190510011053	MARY BORUAH	93.88
3	190510011054	MASUD IQBAL HOSEN	87.76
4	190510011055	MINERVA KALITA	91.84
5	190510011056	MONIDEEPA DEY	97.96
6	190510011057	MONJYOTI KALITA	57.14
7	190510011058	MURSHID AMIN MOLLAH	89.80
8	190510011059	MUTAHARA YEASMIN	83.67
9	190510011060	NANCY KASHYAP	89.80
10	190510011061	NAYANMANI DAS	73.47
11	190510011062	NAZNIN ISLAM	87.76
12	190510011063	NIPJYOTI DEKA	93.88
13	190510011064	PANKAJ KUMAR SAHU	89.80
14	190510011065	PRANAB JYOTI DEKA	87.76
15	190510011066	PRANJAL DAS	91.84
16	190510011067	RAJIV ROY	89.80
17	190510011068	RASHMITA KALITA	93.88
18	190510011069	REKIBUDDIN AHMED	89.80
19	190510011070	REKIBUR AHMED	71.43
20	190510011071	RIPUNJAY KALITA	83.67
21	190510011072	RITURAJ DEKA	73.47
22	190510011073	RIYUNG RAMROR	73.47
23	190510011074	ROCKTIM KAKOTI	79.59
24	190510011075	ROHAN SHARMA	91.84
25	190510011076	ROHIT DAS	93.88
26	190510011077	RUDY NAJIAR	91.84
27	190510011078	RUKSHANA YASMIN HOQUE	87.76
28	190510011079	SAHID AHMED	83.67
29	190510011080	SAHINAZ PARBIN	83.67
30	190510011081	SAIDUL ISLAM	69.39
31	190510011082	SAINDUR THYMMAI PATLONG	97.96
32	190510011083	SAJIN HUSSAIN SAIKIA	79.59
33	190510011084	SAMIRON DAS	89.80
34	190510011085	SANDIPAN DAS	95.92
35	190510011086	SANSKRITA DAS	69.39
36	190510011087	SAYEFA SHAMMA	79.59
37	190510011088	SHEIKH MAHAMAD IMDAD ULLAH	71.43
38	190510011089	SHUVOJYOTI PAUL	69.39
39	190510011090	SOPHIAKI SDOR	89.80

40	190510011091	SOURABH DEY	95.92
41	190510011092	SOURAV NAG	97.96
42	190510011093	SUNFUNG BASUMATARY	73.47
43	190510011094	TABOM RIGIA	83.67
44	190510011095	TAMANNA SHARMA	87.76
45	190510011096	TANMAY HALOI	51.02
46	190510011097	TARIK ISPHAK	14.29
47	190510011098	TASLIMA YEASMIN	87.76
48	190510011099	TRIDEV DAS	87.76
49	190510011100	YARIBHA LATO	85.71
50	190510011101	ZULIN AKHTAR	85.71
51	180510011005	AHISHA KHING	83.67
52	200550011007	MUQTADIRA CHOUDHURY	83.67
53	200550011008	NAFIZ MUSTAKIM	77.55
54	200550011009	NAMESA BERAH	91.84
55	200550011010	SHARUK KHAN	69.39

After consideration of application

SUBJECT: MEDICINAL CHEMISTRY III
SEM: 6TH SEC: A
PROGRAMME: B.PHARM

ROLL NO	NAMES	ATTENDANCE %
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190510011002	ABDUL SAZID	81
190510011003	ABHIJIT MAZUMDAR	83
190510011004	ABHIRUP MUKERJEE	81
190510011005	ABHISHEK DAS	77
190510011006	ABHISHEK KUMAR JHA	77
190510011007	ANGELA GOSWAMI	93
190510011008	ANKITA BARUAH	91
190510011009	ANURAG DUTTA	75
190510011011	ARUNAV KRISHNAMURTY BARUAH	81
190510011012	ASHIQUR RAHMAN	70
190510011013	ASHISH IQBAL	75
190510011014	ASISH AHMED	81
190510011015	ATHARBA BARUAH	70
190510011016	BEDASHRUTI KALITA	85
190510011017	BHABANA KALITA	93
190510011018	BIBARSHA DAIMARI	75
190510011019	BIDISHA DEKA	91
190510011020	BIKASH CHOUDHURY	70
190510011021	BIKASH DAS	77
190510011022	BIKASH RANJAN DAS	81
190510011023	BITOPAN DEKA	75
190510011024	BITUPAN RAJBONGSHI	90
190510011025	BRIJESH KUMAR BASUMATARY	93
190510011026	DEBAJIT BORAH	73
190510011027	DEBOJIT DEKA	79
190510011028	DIUDIUA MUSHAHARI	81
190510011029	EVALINE MYLLIEMNGAP	100
190510011030	FARIDOR RAHMAN	83
190510011032	HASAN ULLAH	75
190510011033	HIMANGSHU CHETRY	52
190510011034	HIMJEET CHETIA	75
190510011035	HIRAK JYOTI BARMAN	68
190510011036	IAITHRANG BOR MYLLIEM UMLONG	89

SUBJECT: MEDICINAL CHEMISTRY III
SEM: 6TH SEC: A
PROGRAMME: B.PHARM

190510011037	JYOTIBRAT GOSWAMI	92
190510011038	JYOTISHMAN DAS	35
190510011040	KOUSHIK PHUKAN	60
190510011041	KOYAL SARKAR	92
190510011042	KRISTRIPRIYA BORUAH	85
190510011043	KUNAL BANIK	85
190510011044	KUNAL PATHAK	93
190510011045	LANI SAIKIA	95
190510011046	LOYANA CHOUDHURY	93
190510011047	MADHURJYA KALITA	63
190510011048	MADHURJYA KASHYAP	73
190510011049	MADHUSMITA PAUL	81
190510011050	MAHARNAB KASHYAP	79
190510011051	MAINAK NATH	93
200550011001	ADIB HUSSAIN	58
200550011002	BIJU AHMED	83
200550011004	DEEPJYOTI DEBNATH	77
200550011005	GARGI DAS	83
200550011006	MR. PERAMTHUNLONG	75

Teacher-in-charge : Mrs. Arundhati Medhi
***** Attendance after considering applications**