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# Syllabus

## BP402T Medicinal Chemistry I (Theory)

**Unit I** **10 hrs**

**Introduction to Medicinal Chemistry**

**History and Development of Medicinal Chemistry**

**Physicochemical Properties in Relation to Biological Action**

Ionization, Solubility, Partition coefficient, Hydrogen bonding, Protein binding, Chelation, Bioisosterism, Optical and Geometrical isomerism.

**Drug Metabolism**

Drug Metabolism Principles: Phase I and Phase II

Factors Affecting Drug Metabolism including Stereo Chemical Aspects

**Unit II** **10 hrs**

**Drugs acting on Autonomic Nervous System**

**Adrenergic Neurotransmitters:**

Biosynthesis and Catabolism of Catechol amines.

Adrenergic Receptors (Alpha and Beta) and their Distribution.

Sympathomimetic Agents: SAR

**Direct acting:** Norepinephrine, Epinephrine, Phenyl ephedrine\* Dopamine, Methyl dopa, Clonidine, Dobutamine, Isoproterenol, Terbutaline, Phenylephrine, Salbutamol\*, Bitoterol, Naphazoline, Oxymetazoline and Xylometazoline.

**Indirect acting Agents:** Hydroxy Amphetamine, Pseudoephedrine, Propylhexedrine.

**Agents with Mixed Mechanism:** Ephedrine, Metaraminol

**Adrenergic Antagonists:**

**Alpha Adrenergic Blockers:** Tolazoline\*, Phentolamine, Phenoxybenzamine, Prazosin, Dihydroergotamine, Methysergide.

**Beta Adrenergic Blockers:** SAR of  $\beta$ -blockers, Propranolol\*, Metipranolol, Atenolol, Betazolol, Bisoprolol, Esmolol, Metoprolol, Labetolol, Carvediol.

**Unit III** **10 hrs**

**Cholinergic Neurotransmitters:** Biosynthesis and catabolism of Acetyl choline,

Cholinergic Receptors (Muscarinic & Nicotinic) and their distribution.

**Parasympathomimetic Agents:** SAR

**Direct Acting Agents:** Acetylcholine, Carbachol\*, Bethanechol, Methacholine, Pilocarpine.

Indirect Acting/Cholinesterase Inhibitors (Reversible & Irreversible)

Physostigmine, Neostigmine\*, Pyridostigmine, Edrophonium chloride, Tacrine hydrochloride, Ambenonium chloride, Isoflurophate, Echothiophate iodide, Parathione, Malthione.

**Cholinesterase Reactivator:** Pralidoxime chloride

**Cholinergic Blocking Agents:** SAR of Cholinolytic agents.

**Solanaceous Alkaloids and Analogues:** Atropine sulphate, Hyoscyamine sulphate, Scopolmaine hydrobromide, Homatropine hydrobromide, Ipratropium bromide.

**Synthetic Cholinergic Blocking Agents:** Tropicamide, Cyclopentolate hydrochloride, Clidinium bromide, Dicyclomine hydrochloride\*, Glycopyrrolate, Methantheline bromide, Propantheline bromide, Benztropine mesylate, Orphenadrine citrate, Biperidine hydrochloride, Procyclidine hydrochloride\*, Tridihexethyl chloride, Isopropamide iodide, Ethopropazine hydrochloride.

#### Unit IV

08 hrs

#### Drugs acting on Central Nervous System

##### A. Sedative and Hypnotics

**Benzodiazepines:** SAR, Chlordiazepoxide, Diazepam\*, Oxazepam, Clorazepate, Lorazepam, Alprazolam, Zolpidem

**Barbiturates:** SAR, Barbitol\*, Phenobarbital, Mephobarbital, Amobarbital, Butobarbital, Pentobarbital, Secobarbital

##### Miscellaneous:

**Amide and Imide:** Glutethimide

**Alcohols and their Carbamate Derivatives:** Meprobamate, Ethchlorvynol

**Aldehyde and their Derivatives:** Triclofos sodium, Paraldehyde.

##### B. Antipsychotics

**Phenothiazines:** SAR, Promazine hydrochloride, Chlorpromazine hydrochloride\*, Triflupromazine, Thioridazine hydrochloride, Piperacetazine hydrochloride, Prochlorperazine maleate, Trifluperazine hydrochloride.

**Ring Analogue of Phenothiazines:** Chlorprothixene, Thiothixene, Laoxpine succinate, Clozapine.

**Fluorobutyrophenone:** Haloperidol, Droperidol, Risperidone.

**Beta amino Ketone:** Moxidone hydrochloride

**Benzamide:** Sulpiride

##### C. Anticonvulsants: SAR and Mechanism of Action

**Barbiturates:** Phenobarbital, Methobarbital.

**Hydantoins:** Phenytoin\*, Mephetoins, Ethotoin.

**Oxazolidine dione:** Trimetahdione, Paramethadione.

**Succinimides:** Phensuximide, Methsuximide, Ethosuximide

**Urea and Monoacyl Ureas:** Phenacemide, Carbamazepine\*.

**Benzodiazepine:** Clonazepam

**Miscellaneous:** Primidone, Valproic acid, Gabapentin, Felbamate.

## Unit V

07 hrs

### Drugs acting on Central Nervous System

#### General Anaesthetics

**Inhalation Anaesthetics:** Halothane\*, Methoxyflurane, Enflurane, Sevoflurane, Isoflurane, Desflurane.

**Ultra Short acting Barbiturates:** Methohexital sodium\*, Thiamylal sodium, Thiopental sodium,

**Dissociative anaesthetics:** Ketamine hydrochloride\*

#### Narcotics and Non-narcotic Anaesthetics

**Morphine and Related Drugs:** SAR of Morphine analogues, Morphine sulphate, Codeine, Meperidine hydrochloride, Anileridine hydrochloride, Diphenoxylate hydrochloride, Loperamide hydrochloride, Fentanyl citrate\*, Methadone hydrochloride, Propoxyphene hydrochloride, Pentazocine, Levorphanol tartarate.

**Narcotic Antagonists:** Nalorphine hydrochloride, Levallorphan tatarate, Naloxone hydrochloride.

**Anti-inflammatory Agents:** Sodium salicylate, Aspirin, Mefenamic acid\*, Neclofenamate, Indomethacin, Sulindac, Tolmetin, Zomepirac, Diclofenac, Ketorolac, Ibuprofen\*, Naproxen, Piroxicam, Phenacetin, Acetaminophen, Antipyrine, Phenylbutazone.