**OPEN ELECTIVE-7 Know Your Medicine**

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| Semester | IV |
| Paper Code | CHOE-VII |
| Paper title | Know your medicine |
| Number of teaching hours per week | 3 |
| Total number of teaching hours per semester | 42 |
| Number of credits | 3 |

1. **INTRODUCTION TO MEDICINAL CHEMISTRY**  **9 h**

Drug, API, drug additives, difference between drugs and medicines, drug targets, receptors, receptor types, theory of drug- receptor interaction, structure–activity relationships of drug molecules LD50, ED50, IC50, ID50 and EC50.

1. **STAGES OF DRUG DEVELOPMENT AND DRUG DISCOVERY 14 h**

Procedure followed in drug design & discovery. Preclinical toxicology testing and IND application: Regulatory acts and regulatory bodies, main stages of preclinical toxicology testing. Clinical trials: Phase I, Phase II and Phase III trials.

1. **CLASSIFICATION OF DRUGS BASED ON THERAPEUTIC ACTION 19 h**

Antibiotics; story of penicillin.

**Case study**: resistance to penicillin.

Antivirals; examples of reversible enzyme inhibitor drugs carbocyclic analogues.

**Case study**: pandemic 2009 (H1N1) oseltamivir (Tamiflu), zanamivir.

Analgesics, antipyretics and anti-inflammatory drugs; aspirin, paracetamol and ibuprofen. Antidiabetics; a general information.

**Case study**: 1. comparison between paracetamol and ibuprofen

Cardiovascular drugs; antianginal drugs, antiarrhythmic agents and antihypertensive agents.

**Case study**: design of angiotensin-converting enzyme (ACE) inhibitors.

Anti-neoplastic agents (anti-cancer drug); organoplatinum compounds, antimetabolites purine, pyrimidine and folate drugs, kinase inhibitors.

**Case study**: story of organoplatinum compounds.

Central nervous system (CNS) drugs; CNS stimulants- anti-depressants.

**Case study**: drug development for central nervous system diseases using *in vitro* blood-brain barrier models and drug repositioning.

**References:**

1. Patrick G. L., An Introduction to Medicinal Chemistry. 5th edition, 2013. Oxford Publishers.
2. R. B. Silverman and M. W. Holladay. The Organic Chemistry of Drug Design and Drug Action. 3rd edition, 2014. Academic Press.
3. Burger’s Medicinal Chemistry and Drug Discovery and Development, Ed. D. J. Abraham and D. P. Rotella. 7th edition, 2010. Wiley-Blackwell Publishers.