

Birla Institute of Technology and Sciences, Pilani, Pilani-Campus, Rajasthan

Midterm Exam

II Semester 2022-2023

Course Name: Principles of Drug Discovery

Closed Book

Course Code: PHA G539

Date: 17/03/2023

Duration: 60 min

Max. Marks: 20

1. Nuclear receptors (NRs) are a family of ligand-regulated transcription factors that are activated by hormones/other ligands and modulate gene transcription.
 - (i) Give detailed description of the structure and mechanism of working of nuclear receptors. [5]
 - (ii) Explain the role of NRs in drug metabolism. [3]

2.
 - (i) GPCRs are important drug targets from pharmaceutical perspectives? Why are they so commonly targeted for diverse diseases? [3]
 - (ii) What are new avenues enhancing research in this direction? [1]
 - (iii) Discuss GPCR targeting for any two CNS disorders. [4]

3. What is the gating mechanism associated with Ligand gated ion channels? [2]

4. How mTORC1 activates its downstream effectors? Describe the functions of these downstream effectors? [2]

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Duration: 30 min

Max. Marks: 10

- (i) If a protein/protein family is the target of an approved small molecule drug, this gives a very high degree of confidence in druggability. Explain in what scenarios this may fail. [3]
 - (ii) Sequence similarity/domain analysis can help to identify additional proteins with druggable domain. What different types of descriptors can be calculated? [2]
- Spatial and temporal selectivity enable allosteric modulators to provide specific and effective regulation of GPCR activity, which is important for developing drug molecules. Giving example of allosteric modulators of GPCR describe temporal selectivity. [2]
- Name few examples of targets of estrogen receptor. Design two experiments to study the modulators of ER. Give details of these experiments. [3]