

**Thematic lesson plan of seminars  
in the discipline "Molecular regulation of metabolism and cell cycle"  
for students of the educational program  
specialist in the specialty 33.05.01 Pharmacy,  
direction (profile) Pharmacy,  
form of study full-time  
for the 2023-2024 academic year**

№	Thematic blocks	Hours (academic)
1.	Interaction of ion channels with rafts.	2,1
2.	Ligand affinity for the receptor.	2,1
3.	Types of G-proteins, structure and functions.	2,1
4.	Protein kinases: structure, classification, properties and biological role.	2,1
5.	Lipophilic hormone receptors. Ca <sup>2+</sup> signaling.	2,1
6.	Receptor and cytoplasmic tyrosine kinases.	2,1
7.	Signaling transmission induced through signalosomes.	2,1
8.	The role of small molecules in the regulation of metabolism.	2,1
9.	Family of Toll-like receptors.	2,1
10.	Molecular basis of afferent signal transmission.	2,1
11.	Nitric oxide is a unique messenger.	2,1
12.	Molecular mechanisms of diabetes development.	2,1
13.	Intercellular interactions through integrin receptors.	2,1
14.	Cell cycle.	2,1
15.	Apoptosis, ways of activation.	2,1
16.	Oncogenesis.	2,1

	Intermediate certification (credit test)	2,1
	Total	36

Considered at the meeting of the department of "10" \_may\_ 2023, protocol No 16

Head of the Department



**O.V. Ostrovskiy**