VOLGOGRAD STATE MEDICAL UNIVERSITY

DEPARTMENT OF PHARMACOLOGY AND BIOINFORMATICS

Methodological recommendations for students for practical classes

«Immunobiological and gene therapy drugs»

Thematic block: **Immunobiological drugs**

Class topic:

Recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors)

Pharmaceutical faculty

1. Class aims

• learn to analyze the action of recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors) based on the totality of their pharmacological properties, mechanisms and localization of action;

• learn to evaluate the possibilities of using recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors) for the purposes of pharmacotherapy of viral infections;

2. TASKS

• ability to organize the possibility of using recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors) for the treatment and prevention of diseases;

• ability to evaluate the possibility of using recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors) depending on the spectrum of their activity

• ability to analyze possible side and toxic effects of recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors).

Formed competencies: УК-1.1.3.; УК-1.2.1, УК-1.2.2, УК-1.2.3.; УК-1.3.1, УК-1.3.2.; УК-6.1.1.; УК-6.2.1, УК-6.2.2.; УК-6.3.1, УК-6.3.2, УК-6.3.3, УК-6.3.4.; ОПК-1.1.1.; ОПК-1.2.1, ОПК-1.2.2.; ОПК-1.3.1.; ОПК-6.1.1.; ОПК-6.2.1.; ОПК-6.3.1.; ПК-7.1.1.; ПК-7.2.1.; ПК-7.3.1.

Brief summary of the topic, suggested questions for discussion:

1. Cytokine therapy in clinical practice. History of development.
2. Cytokine system. Principles of organization and main functions. Classification.

#	Structural features	Cytokines
1	Alpha helical strands, short chain; Alpha helical strands, long chain	IL-2, IL-3, IL-4, IL-5, IL-7, IL-9, IL-13, 15, IFN, M-CSF, GM-CSF IL-6, 10, 11 oncostatin-M
2	Beta-pleated structures, long chain	Family TNF-a, IL-1, TGF-b

3	Alpha/beta short chain	Chemokines
4	Mixed mosaic structures	IL-12

3. Interferons. IFNα, INFβ, INFγ.
4. Interleukins.
5. Tumor necrosis factors.
6. Colony-stimulating factors.
7. Advantages of using recombinant cytokines.
8. Recombinant cytokines.

List of required drugs for synonym search

Recombinant IFN α2a	
Recombinant IFN α2β	
Recombinant IFN β	
Recombinant IFN γ	
Aldesleukin	
Recombinant CSF	

Main functions of interferons

Interferons	Main functions
IFNα	
IFNβ	
IFNγ	

Main functions of interleukins

Interleukins	Main functions
Interleukin-1	
Interleukin-2	
Interleukin-3	
Interleukin-4	
Interleukin-13	
Interleukin-5	
Interleukin-6	
Interleukin-11	
Interleukin-7	
Interleukin-8	
Interleukin-9	
Interleukin-10	
Interleukin-12	
Interleukin-33	

Interleukin 35, 37	

Topics of abstracts on the topic: Recombinant drugs: cytokines (interferons, interleukins, colony-stimulating factors, tumor necrosis factors):

1. Recombinant preparations of colony-stimulating factors in clinical practice.
2. Involvement of tumor necrosis factors in the mechanism of neoplasm development.

List of recommended literature, professional databases, information reference systems, electronic educational resources recommended for preparing abstracts:

1. Наровлянский А. Н., Ершов Ф. И., Гинцбург А. Л. Интерфероны: перспективные направления исследований //Иммунология. – 2013. – Т. 34. – №. 3. – С. 168-172.
2. Гизингер О. А. Интерфероны и интерферонотерапия. Обзор литературы //Терапевт. – 2021. – №. 7. – С. 46-59.
3. С. А. Кетлинский, А. С. Симбирцев. Цитокины. -2008.
4. Симбирцев А. С. Цитокины в патогенезе и лечении заболеваний человека. -2018.

Independent work of students:
1. Search for synonyms (required drugs are entered into workbooks).
3. Solving situational problems on the topic. The solutions to the problems are entered into workbooks.
4. Working with advertising brochures of medicines on this topic.