1001Bacterial cells differ from eukaryotic cells by

0+ simpler structure and organization of the cell
1+ production of ATP on the cytoplasmic membrane
2+ lack of nucleus and nuclear membrane
3- different type of mitochondria
4- lack of fimbriae
5- polyploid genome
6+ different type of ribosomes
7- more complex structure of flagellae
8+ different way of DNA replication
9+ lack of lamellar systems in the cytoplasm

1002For bacteria are typical the following properties

0+ the majority of bacteria have peptidoglycan in the cell wall
1- bacterial ribosomes are always free, unbound to the cytoplasmic membrane
2+ cell wall structures of bacteria are recognised by PRR of the host
3- all bacteria are able to produce their own ATP molecules
4- all bacteria are cultivable on laboratory culture media
5+ bacteria are able to enter to the state of persistence
6+ bacteria prefer the biofilm form of life - it is more advantageous for them
7+ bacteria have respiratory chain localised at the cytoplasmic membrane
8- the majority of bacterial species is able to sporulate
9+ bacterial proteosynthesis differs from proteosynthesis in eukaryotic cells

1003For cytoplasmic membrane of bacteria is typical the following

0+ with exception to mycoplasmas and ureaplasmas it does not contain cholesterol
1+ it is a place of energy generation for flagellae, transport systems and ATP production
2+ it contains efflux systems for antibiotics and for other toxic substances
3- it is not interacting with ribosomes or bacterial chromosome
4+ it is built-up by a phospholipidic bilayer
5- it determines the shape and osmotic stability of bacterial cell
6- it cannot be damaged by any antimicrobial drug
7- various larger hydrophilic molecules can passively pass through it
8+ it is a place for anchoring of flagellae
9+ bacterial secretion systems are located in its structure

1004For the bacterial peptidoglycan cell wall is typical the following

0- bacteria are always lysed after cell wall destruction
1+ it determines the stainability of bacteria according to Gram
2+ it provides mechanical and osmotic stability to bacteria
3- it covers and masks important bacterial adhesins
4+ it contains antigens used in microbiologic diagnostics
5+ it is not present in Mycoplasma and Ureaplasma
6+ it is a target structure for beta-lactam and glycopeptide antibiotics
7- it is lysed by proteolytic enzymes of phagocytes
8- it is regularly resistant to lysozyme
9- L-forms of bacteria have thicker peptidoglycan cell wall

1005Cell wall of Gram-positive bacteria contains / can contain the following

0+ a thick peptidoglycan layer
1- outer membrane proteins
2+ teichoic acids
3+ capsule
4- cholesterol
5- porins
6+ protein adhesins
7+ penicillin-binding proteins (PBP)
8- outer phospholipidic membrane with lipopolysaccharide
9- mycolic acids

1006Cell wall of Gram-negative bacteria contains

0- lysozyme
1- covalently bound penicillinase
2- arabinogalactan
3- teichoic acid
4+ lipopolysaccharide
5+ outer membrane proteins (OMPs)
6+ thinner peptidoglycan layer
7- long-chain non-saturated fatty acids
8+ porins
9+ periplasmic space

1007The outer membrane of Gram-negative bacteria

0+ is composed of asymmetric lipidic bilayer
1+ lipopolysaccharide molecules are included in its structure
2+ after its disruption, large amounts of endotoxin are released
3+ contains outer membrane proteins, export systems and receptors
4+ contains porin proteins regulating the entry of large molecules
5- is resistant to the membranolytic complex of complement
6- is stable also in the presence of chelating agents
7- is resistant to activity of non-polar solvents
8- is damaged by lysozyme activity
9- is permeable for all antibiotics

1008The cell wall of acid-fast bacteria contains

0+ peptidoglycan
1+ mycolic acids
2+ arabinogalactan
3+ lipoarabinomannan
4+ trehalose dimycolate
5- cholesterol
6- lipopolysaccharide
7- lipoteichoic acid
8- porins

9- chitin

1009The acid-fast cell wall is responsible for
0+ hydrophobicity of acid-fast bacterial surface
1- extreme susceptibility to acids, alkalis and alcohols
2+ resistance to desiccation
3- good stainability by the Gram stain
4+ susceptibility of mycobacteria to isoniazid, ethionamide and ethambutol
5+ resistance to cell degradation by complement and lysozyme
6- increased susceptibility to disinfectants
7- acute course of tuberculosis and mycobacterioses
8+ slow growth of acid-fast bacteria
9+ granuloma formation and chronic course of disease

1010Bacterial capsule
0- it is a cell surface component of all bacteria
1+ it protects bacteria from phagocytosis
2+ capsular antigens can be used in the rapid diagnostics of meningitis and sepsis
3+ it is a key component of several subunit vaccines
4+ it is a highly hydrated net-like polysaccharide or protein structure
5- it is an alternative name for biofilm matrix
6- it is not firmly attached to the bacterial surface
7+ it can be coded for by genes on mobile genetic elements
8- capsular structures are usually highly antigenic
9- it substantially decreases the bacterial virulence

1011Capsule is an important virulence factor of the following bacteria
0+ Neisseria meningitidis
1- Neisseria gonorrhoeae
2- Borreliella burgdorferi
3- Corynebacterium diphtheriae
4+ Yersinia pestis
5- Vibrio cholerae O1
6+ Bacillus anthracis
7+ Streptococcus pneumoniae
8+ Haemophilus influenzae
9- Mycoplasma pneumoniae

1012Mark the Gram-positive bacterial genera
0+ Lactobacillus
1+ Listeria
2- Legionella
3- Leptospira
4+ Staphylococcus
5- Shigella
6- Salmonella
7+ Streptococcus

8- Streptobacillus
9- Stenotrophomonas

1013Mark the Gram-negative bacterial genera
0- Arcanobacterium
1- Erysipelothrix
2+ Vibrio
3- Enterococcus
4+ Campylobacter
5- Faecalibacterium prausnitzii
6+ Helicobacter
7+ Klebsiella
8+ Moraxella
9+ Neisseria

1014Mark bacteria not stainable by the Gram stain and containing lipopolysaccharide
0+ Treponema, Borrelia and Leptospira
1+ Rickettsia, Orientia and Coxiella
2+ Mycoplasma and Ureaplasma
3+ Chlamydia
4+ Ehrlichia
5- Tropheryma
6- Atopobium
7- Mycobacterium
8- Peptoniphilus, Finegoldia and Schleiferella
9- Bacteroides, Tanerella and Prevotella

1015Mark Gram-positive bacteria, which form branching filaments
0+ Nocardia
1+ Actinomyces
2+ Actinomadura
3- Actinobacillus
4+ Streptomyces
5- Streptococcus
6- Streptobacillus
7- Gardnerella
8- Bifidobacterium
9- Fusobacterium

1016To the strongly acid-fast bacteria belong
0- Enterococcus spp.
1- Staphylococcus spp.
2- Eubacterium spp.
3- Lactobacillus spp.
4+ Mycobacterium spp.
5+ Mycobacteroides spp.
6+ Mycolicibacterium spp.

7+ Mycolicibacter spp.
8+ Mycolicibacillus spp.
9- Mycoplasma spp.

1017To the curved and helical bacteria with external flagellae belong
0- Haemophilus
1+ Vibrio
2- Elisabethkingia
3- Bifidobacterium
4+ Campylobacter
5+ Arcobacter
6+ Helicobacter
7+ Wolinella
8+ Spirillum
9- Francisella

1018To the spiral bacteria with axial filaments belong
0- Lactobacillus
1+ Leptospira
2- Listeria
3- Legionella
4+ Borrelia
5- Brucella
6+ Treponema
7- Tanerella
8- Vibrio
9- Porphyromonas

1019Mark the bacteria non-cultivable in laboratory culture media
0+ Tropheryma whipplei
1+ Treponema pallidum
2+ Mycobacterium leprae
3+ Rickettsia spp.
4+ Chlamydia spp.
5+ Spirillum minus
6- Mycoplasma spp.
7- Mycobacterium avium
8- Borrelia burgdorferi
9- Leptospira spp.

1020To the anaerobic bacteria belong
0+ bacteria without enzymes that detoxify reactive oxygen species
1+ Clostridium tetani and Clostridium histolyticum
2- Pseudomonas fluorescens and Neisseria meningitidis
3+ agents of botulism
4+ Bacteroides fragilis and Prevotella melaninogenica
5- bacteria with complete respiratory chain

6- Helicobacter pylori and Campylobacter coli
7- Mycobacterium tuberculosis and Nocardia spp.
8- bacteria transmissible by water and aerosol
9+ Veillonella and Actinomyces

1021To the microaerophilic or capnophilic bacteria belong
0- bacteria with strictly anaerobic metabolism
1+ Neisseria gonorrhoeae and Haemophilus influenzae
2- all bacteria of the human skin microbiota
3+ Helicobacter pylori and Campylobacter spp.
4+ bacteria of the HACEK group
5- staphylococci, enterococci and listeriae
6- sapronotic diseases agents
7+ many of the fastidious bacteria
8- Gram-negative non-fermenting bacteria
9+ bacteria infecting stomach

1022To the Gram-negative non-fermenting bacteria belong
0+ bacteria with oxidative metabolism only
1+ Pseudomonas and Acinetobacter
2+ Burkholderia and Stenotrophomonas
3+ many important agents of nosocomial infections
4+ Alcaligenes and Elisabethkingia
5- bacteria with excellent susceptibility to antibiotics and disinfectants
6- Providentia, Bacteroides and Prevotella
7- agents of aseptic meningitis
8- Vibrio and Campylobacter
9- Aeromonas and Plesiomonas

1023To the bacteria of HACEK group belong
0+ small Gram-negative capnophilic fastidious bacteria
1+ several agents of subacute endocarditis
2+ several bacteria present in the subgingival dental plaque
3+ Eikenella, Cardiobacterium and Aggregatibacter
4+ Haemophilus and Kingella
5- microaerophilic intestinal bacteria (Campylobacter)
6- aerobic bacteria resistant to all cephalosporins
7- Cutibacterium, Corynebacterium and Actinomyces
8- Helicobacter, Erysipelothrix and Klebsiella
9- the most common agents of dental caries

1024In the organism of the host, predominantly intracellularly multiply these bacteria
0- Escherichia coli
1+ Francisella tularensis
2- Vibrio cholerae
3+ Brucella melitensis
4+ Legionella pneumophila

5+ Mycobacterium tuberculosis
6- Streptococcus pyogenes
7- Pseudomonas aeruginosa
8+ Listeria monocytogenes
9- Enterococcus faecalis

1025Mark the strictly intracellular bacterial genera
0+ Chlamydia
1- Mycoplasma
2- Mycobacterium
3+ Rickettsia
4+ Coxiella
5+ Ehrlichia
6+ Anaplasma
7+ Orientia
8- Pasteurella
9- Brucella

1026L-forms of bacteria are formed
0+ as a reaction to lysozyme activity
1+ as a reaction to activity of some antibiotics
2- by reversible lack of bacterial capsule
3+ by some bacteria during treatment with penicillin
4- frequently by mycoplasmas during antibiotic treatment
5+ by reversible lack of peptidoglycan in the cell wall
6- as a consequence of sporulation
7- in the environment with decreased partial pressure of oxygen
8- in the environment with changed osmotic pressure
9- only in laboratory conditions

1027To important factors supporting the biofilm formation belong
0+ electrostatic interactions of bacteria with the colonised surface
1+ bacterial adhesins
2+ the matrix proteins of the host
3- presence of antibodies against bacterial surface antigens
4- environment with inhibitory concentrations of toxic substances
5+ environment with subinhibitory concentrations of antimicrobial substances
6- high population density of bacteria in biofilm
7+ foreign body presence in the organism of the host
8+ presence of tissue damaged by previous pathological process in the body of the host
9- dispersins production by microorganisms in biofilm

1028Biofilm
0- increases the susceptibility of bacteria to antimicrobial therapeutics
1- decreases the resistance of bacteria to antimicrobial therapeutics
2+ helps bacteria to resist the activity of antimicrobial therapeutics
3+ helps bacteria to resist the adverse environmental factors

4+ helps bacteria to maintain the vitality during antimicrobial therapy
5- after dispersion, bacteria are concentrated exclusively in the near proximity of biofilm
6+ it is a focus, from which bacteria recolonise the host after antibiotic therapy
7+ it is a focus, from which bacteria are spreading to the other localities of the body
8- it is not present on mucosae of healthy humans
9- during antibiotic therapy, it has only negative impact on the host

1029The presence of biofilm is typical for
0- acute tonsillitis
1+ infections of chronic wounds
2+ endocarditis
3+ chronic osteomyelitis
4+ catheter-related infections and periimplantitis
5+ chronic urogenital infections
6- diarrhoea caused by bacterial toxins
7- septic neonatal meningitis
8- botulism
9- atypical pneumonia

1030For bacteria in biofilm is characteristic that they
0- are more virulent than their planktonic forms
1+ have inhibited motility
2+ use the quorum-sensing regulations more intensively
3+ do not produce toxins and invasins
4+ more frequently enter to the persistent state
5+ more effectively resist the antimicrobial agents' activity
6+ better resist the immune mechanisms of the host
7- cannot enter to the planktonic form of life
8- are not able to cause disease in the human body
9- exist in biofilm form of life only during dysbiosis

1031In the human body, the antibiotic therapy is more successfully survived by
0- rapidly multiplying bacteria
1+ bacteria in biofilm
2+ L-forms of bacteria
3+ small colony variants of bacteria
4+ persister bacteria
5+ clostridia in large intestine after sporulation
6- bacteria in exponential phase of growth
7+ bacteria in stationary phase of growth
8- highly virulent bacteria
9- encapsulated bacteria

1032Sporulation of bacteria
0+ is activated by adverse life conditions
1- is a general feature of all bacteria
2+ it starts at the end of exponential growth phase of bacterial community

3- is typical for the period of invasion of bacteria to the body of the host
4+ starts after signalisation of nutrients and water depletion, or in unsuitable temperature
5- is a continuation of the usual binary fission of the bacterial cell
6+ results in endospore production inside the mother cell
7- the spore envelopes are formed around the mother cell of the spore
8+ in prespore the water content decreases and DNA interacts with protective molecules
9- bacteria can after sporulation employ only the anaerobic metabolic pathways

1033Bacterial spores
0+ are metabolically non-active and resistant to all antibiotics
1- are producing large amounts of biofilm matrix
2+ are resistant to desiccation, irradiation, enzymes, and many chemical substances
3- are inactivated by boiling
4+ are inactivated after 15-minutes exposition to 120 °C (e.g. during autoclaving)
5+ contribute to nosocomial infections caused by Clostridium difficile
6- start to germinate automatically after UV light irradiation
7- germinate in the convenient conditions even without disruption of the spore envelopes
8+ can be viable even during several centuries
9+ represent ideal form of bacterial existence from the bioterroristic point of view

1034Spore-forming bacteria
0- Streptomyces and Actinomyces genera can form spores
1+ Clostridium and Bacillus genera can form spores
2+ are difficult to remove from the hospital and laboratory environment
3- Mycobacterium and Nocardia genera can form spores
4- Cutibacterium and Corynebacterium can form spores
5- Schleiferella, Wolinella and Arcobacter can form spores
6- Atopobium, Peptoniphilus and Finegoldia can form spores
7- after sporulation they can long-lastingly persist in the wound
8+ they can long-lastingly survive in environment without water and nutrients
9+ in the human intestinal tract, they can survive antibiotic treatment

1035Bacteriocins
0+ are natural antibiotics of bacteria
1+ help bacteria to fight with other microbes during biotope colonisation
2- damage predominantly the eukaryotic cells
3+ are proteins
4+ participate on the "colonisation resistance" on the colonised human mucosae
5+ inactivate the target cells by various mechanisms
6+ ability to produce bacteriocins is usually transmissible by plasmids
7- act non-specifically against all bacteria
8+ the bacteriocin producers are protected against their own bacteriocins
9- for bacteriocins activity is necessary that bacteria create close contact with target cell

1036Bacterial genome
0+ the bacterial genome is usually haploid
1+ essential gens are vitally important for bacteria

2+ accessory genes help bacteria to survive in stress conditions
3- accessory genes are for bacteria vitally important
4- to bacterial pangenome belong the most important accessory genes only
5+ mobile genetic elements play role in bacterial evolution
6- bacterial chromosomal genes cannot be mobilised
7+ pathogenicity islands are areas of bacterial genome containing virulence genes
8- all chromosomal cassettes contain only a single gene of antimicrobial resistance
9+ bacterial genome can be used in the identification and typing of bacteria

1037Replication, transcription and translation in the bacterial cells
0+ these processes are performed differently in the bacterial and eukaryotic cells
1+ these processes may be selectively blocked by antimicrobial therapeutics
2+ replication of bacterial DNA is affected by fluoroquinolones
3- genes for bacterial DNA-gyrase are highly conservative and do not mutate
4- bacterial DNA is stable and is not damaged by antimicrobial agents
5- transcription and translation in bacterial cell cannot occur simultaneously
6+ bacterial RNA-polymerase is a target molecule for rifampicin
7- bacterial mRNA is translated on ribosomes identical with eukaryotic ones
8+ these processes are suppressed in bacterial persisters
9- these processes are inhibited by lipopeptide antibiotics

1038Horizontal transfer of bacterial genes
0+ occurs with aid of bacteriophages
1+ occurs during transfer of plasmids
2+ occurs by transmission of extracellularly released bacterial DNA
3+ is engaged predominantly in the transfer of accessory genes
4- can occur exclusively among strains of the same bacterial species
5- is inhibited by subinhibitory doses of antibiotics
6- it is a selective transfer of accessory genes
7- transposons do not play role in this process
8+ plays role in transmission of genes coding for resistance mechanisms
9+ plays role in transmission of genes coding for virulence factors

1039Transduction
0+ is transmission of genetic information to bacteria by bacteriophages
1- requires close contact of donor bacterial cell with acceptor bacterial cell
2+ generalised transduction requires engulfment of bacterial DNA fragment to phage capsid
3- transducing phage particle causes lysis of recipient bacterial cell
4+ specialised transduction requires incorrect prophage excision from bacterial DNA
5- it is an entry of free DNA to the bacterial cell
6- occurs with aid of sex-pili
7- it is a synonym for lysogenic conversion
8+ it is typical for G+ as well as for G- bacteria
9+ by generalised transduction, any bacterial gene can be transmitted

1040Transformation
0+ it is a transmission of extracellular free DNA to the bacterial cell

1+ it can cause changes in bacterial genetic information
2+ it is a take-up of free foreign naked DNA by the competent donor bacterial cell
3+ Bacillus and Haemophilus genera are naturally competent for being transformed
4+ streptococci and neisseriae are naturally competent for being transformed
5+ DNA accepted during transformation can be integrated to the bacterial genome
6- it occurs with aid of sex-fimbriae
7- it is a process of mutated bacterial DNA reparation
8- it is a mutational change of bacterial DNA
9- it is a mutual interchange of DNA among bacteria

1041Plasmids
0+ they are present in the bacterial cytoplasm
1+ they replicate independently from bacterial chromosome
2- all bacterial plasmids are conjugative
3+ plasmids lacking transfer genes can be mobilised by conjugative plasmids
4- they are composed of double-stranded circular RNA molecule
5+ they can carry accessory genes important for survival of bacteria in adverse conditions
6- they are transmitted among bacteria only very rarely
7+ they may carry genes coding important virulence factors
8- they carry genes important for basic pathways of bacterial metabolism
9- they are approximately as large as the bacterial chromosome

1042Conjugation
0+ it is transmission of plasmid DNA among bacteria
1- it is transmission of plasmid DNA among bacteria by bacteriophages
2- it is transmission of extracellular DNA with aid of sex-fimbriae
3+ starts after contact of recipient bacteria with a sex-fimbria
4+ it is intensively occurring among intestinal bacteria
5+ it can facilitate spreading of antimicrobial resistance genes in nosocomial bacteria
6- occurs only among pathogenic bacteria
7- occurs non-specifically among all bacteria
8+ can occur also among bacteria of different species and genera
9+ is very frequent among extracellular G- bacteria

1043Sex-pillus is a structure used by bacteria
0- during initiation of bacterial binary fission
1- during sexual transmission to a new human host
2+ during horizontal bacterial gene exchange
3- for adhesion to a host cell
4+ for attachment to the interacting acceptor bacterial cell
5+ during transmission of plasmids
6- during genetic material exchange by transduction
7+ during genetic material exchange by conjugation
8- during transmission of genetic information by transformation
9+ during gene exchange typical for G- bacteria

1044Plasmids may in bacterial cell determine

0- lipopolysaccharide synthesis
1+ enterotoxins production
2- production of flagellae
3- ribosome synthesis
4+ production of colicins
5+ resistance to antibacterial drugs
6+ production of sex-pili
7- synthesis of peptidoglycan
8+ production of some exotoxins
9- production of basic enzymes important for ATP production

1045Bacteriophages
0- they contain both DNA and RNA in their capsids
1+ they infect susceptible bacterial cells
2- they are able to infect eukaryotic cells as well
3+ after the contact with receptor, they insert their genome to the bacterial cell
4- can cause diseases in humans
5+ during lysogenic cycle, the phage genome is inserted to the bacterial chromosome
6- during lytic cycle, the bacterial cell remains intact
7+ they can be used for typing of bacteria
8+ they are part of human microbiota
9+ they may be involved in gene exchange among bacteria

1046Lysogenic conversion of bacterial cell
0+ is expression of new bacterial property, coded for on a temperate phage
1- occurs after transmission of bacterial DNA by transduction
2- is expression of new bacterial property after process of transformation
3+ is a consequence of infection by lysogenic bacteriophage
4- is a consequence of infection by a virulent bacteriophage
5- is a consequence of phage endolysins activity
6- is a regular event during phage therapy of infectious diseases
7+ may occur after insertion of phage DNA to the bacterial chromosome
8- it is a consequence of lytic infection of bacterial cell by bacteriophage
9+ is responsible for production of diphtheric or botulinic toxin

1047Phage therapy
0+ uses well characterised phages
1- uses lysogenic phages
2+ is suitable for patients with chronic infections
3+ is suitable for patients infected by polyresistant bacteria
4+ for increased spectrum of activity, phage cocktails are used
5+ phages actively multiply at the site of infection
6- it is not suitable for children and pregnant women
7- it is not suitable for immunosuppressed patients and elderly
8+ it is applied mostly locally
9- mucosal candidiasis may be a side effect of phage-therapy

1048The following are related to the pathogenicity of a microorganisms

0+ initiation of disease in a susceptible host
1+ initiation of disease in non-immune immunocompetent host (primary pathogen)
2- initiation of disease only after impairment of immunity (primary pathogen)
3+ initiation of disease only in immunocompromised host (opportunistic pathogen)
4- disruption of the human microbiota equilibrium
5+ escape from the non-specific immune response of the host
6+ damage to the host (to the structures or functions of his body)
7- suppression of the multiplication of non-pathogenic bacteria
8- colonisation of human skin and mucosae
9- sporulation in the infected tissues of human body

1049Virulence of microorganism

0- is the ability of microbial species to produce disease
1- is a genus-specific property of microbes
2- is a species-specific property of microbe, coded for by essential genes
3+ is a degree of pathogenicity, specific for the particular microbial strain
4+ is a genetically based property, mostly coded for by accessory genes
5+ depends on the spectrum and quantity of the produced virulence factors
6- is a stable property of a particular bacterial strain
7+ it can be increased or decreased naturally or by genome manipulations
8+ decrease of virulence may result in attenuated strain, suitable for vaccination
9+ artificial increase of virulence may result in potential biological weapon production

1050The iniciation of human infectious disease is supported by

0+ susceptibility of the host to the infectious agent
1+ the higher virulence of the infectious agent
2+ decreased immunity of the host (by the age, by underlying disease…)
3+ high number of infecting microbial particles
4+ the appropriate way of microbe entry to the host
5- previous vaccination of the host against the disease
6- recovery from the particular disease in the past
7- well working immune system
8- adequate nutrition of the host
9- entry of the microbe to the latency

1051Virulence factors of bacteria

0+ are responsible for damage to the tissue and functions of the host organism
1+ help bacteria to survive and cause damage in the host
2+ can be synchronised in production by quorum-sensing systems
3+ can be lost by bacterial cell and can be acquired by horizontal gene transfer
4+ help to defeat the protective immune mechanisms of the host
5- are activated only after initiation of infectious disease
6- all of them are essential components of bacterial cell
7- are produced constitutively
8- cannot influence the immune reactions of the host
9+ their production if regulated by signals from bacterial environment

1052To the factors of virulence and to their functions belong

0+ adhesins – protect bacteria from mechanical removal from the host surfaces
1- capsule - stimulates inflammatory reactions of the host organism
2- fimbriae – inactivate complement
3+ type 3 secretion systems – initiate bacterial invasion to the host cell
4+ exotoxins – specifically damage the integrity or the functions of the target cells
5+ bacterial fibrinolysin – helps bacteria to spread in the host organisms
6- cytoplasmic membrane structures – inhibit opsonisation of the bacterial surface
7- bacterial porins – help bacteria to adhere to the host mucosae
8+ extracellular proteases and hyaluronidase - degrade the host tissues
9+ tracheal cytotoxin – damages the function and integrity of mucociliary epithelium

1053The function of mucociliary epithelium is damaged by

0- Staphylococcus aureus on the nasal mucosa
1+ tracheal cytotoxin during pertussis and gonorrhoea
2+ Haemophilus influenzae during pneumonia and otitis media
3- Haemophilus ducreyi during genital infection
4+ Bordetella pertussis during whooping cough
5- bacterial extracellular polymeric substance during chronic prostatitis
6- pertractin produced by bordetellae during whooping cough
7+ Mycoplasma pneumoniae during respiratory tract infections
8+ Neisseria gonorrhoeae during adnexitis
9- Corynebacterium diphtheriae during diphtheria

1054Lipopolysacharid (LPS)

0- is a component of the cytoplasmic membrane of all bacteria
1- is actively extracellularly released by bacterial cells
2+ is massively released after damage to G- bacteria
3+ the lipidic part of LPS is responsible for biologic activity
4+ the polysaccharidic part of LPS is responsible for antigenic specificity
5- is the only bacterial cell component with endotoxin activity
6- suppresses the natural immunity mechanisms in the infectious focus
7+ stimulates production of acute phase proteins by liver cells
8- large amounts of LPS in bloodstream block the acute inflammatory response
9+ can bound to TLR-4 of mammalian cells and stimulate cytokine production

1055Endotoxin of Gram-negative bacteria (LPS)

0- inhibits the activity of complement and blocks the blood coagulation
1+ triggers disseminated intravascular coagulation
2- cause fever by direct interaction with hypothalamus
3+ activates degranulation of thrombocytes and PMNL and activates mastocytes
4+ interacts with vascular endothelium and increases vascular permeability
5- cannot influence thrombocytes or granulocytes
6+ activates macrophages, which start to produce cytokines (IL-1, TNF)
7- increases the level of cAMP and cGMP in endothelial cells
8+ after massive release to the bloodstream it triggers hypovolemia and septic shock

9+ after local release in appropriate amounts it positively stimulates the immune response

1056Protein-A
0- is a component of bacterial slime layer
1- is produced by Streptococcus pneumoniae
2+ is produced by Staphylococcus aureus
3- is produced by proteolytic strains of enteric bacteria
4- is produced by Listeria monocytogenes
5+ is used for laboratory identification of Staphylococcus aureus
6+ it binds the Fc-part of IgG
7- is exposed on the cell wall of group A streptococci
8+ inhibits the opsonisation of bacterial cell
9+ inhibits the phagocytosis of bacteria

1057Bacterial exotoxins have the following features
0+ they are proteins
1+ many of them are thermolabile
2- they are produced only by G+ bacteria
3+ they have various modes of specific biologic activity
4- they are components of G- bacterial cell wall
5+ can be detoxified without impact on their immunogenicity
6- act only locally, at the place of their production
7- lysis of producer bacterial cell is necessary for their release
8+ interact only with target cells having specific receptors
9+ they can be neutralised by antibodies

1058Mark the toxins with superantigen properties
0+ TSST-1
1- cholera toxin
2+ streptococcal pyrogenic exotoxin
3- toxin A and toxin B of Clostridium difficile
4- pertussis toxin
5- diphtheric toxin
6+ staphylococcal enterotoxins
7+ toxins that cause symptoms of scarlet fever
8+ toxin that cause staphylococcal toxic shock
9- shiga-toxin

1059Diphtheric toxin
0+ it irreversibly blocks the function of ribosomes in the target cell
1- it kills only neutrophils and macrophages
2+ preferentially damages heart, kidney and the nervous system
3- it damages the cytoplasmic membrane of the target cells
4- transitorily inhibits the ribosomes in the affected cell
5+ it inhibits the proteosynthesis in the target cells
6+ it contributes to pseudomembrane formation at the site of infection
7+ is produced only by bacteria infected by a temperate beta-phage

8- is released only after lysis of the producer bacterial cell
9- it can act only locally, at the site of infection

1060Detection of C. diphtheriae toxinogenicity
0- can be performed by agglutination reaction with C. diphtheriae
1+ can be performed by precipitation of diphtheric toxin with antitoxin
2- should be confirmed by Western-blot
3+ should be performed in every clinical isolate of C. diphtheriae
4- if patient has symptoms of diphtheria there is no need for such detection
5- is usually performed by immunofluorescence assay
6+ can be done by Elek test
7- it is done only in epidemiologically significant cases
8+ it can be performed by detection of gene coding for diphtheric toxin
9- it should be confirmed by test on laboratory animals

1061Toxin of Vibrio cholerae (cholera toxin)
0+ damages the enzymatic systems of the target cells
1+ acts only locally - on enterocytes with the specific receptor
2- selectively increases the level of cGMP in enterocytes
3+ increases the level of cAMP in enterocytes
4- stimulates hyposecretion of electrolytes and water to the intestinal lumen
5- activates anaphylactic reaction on the intestinal mucosal surface
6- damages the enterocyte cytoplasmic membrane
7+ in patient without treatment it can cause death by severe dehydration
8- reversibly damages the intestinal mucosal cells
9- is neurotoxic – it inhibits the intestinal peristalsis

1062The level of cAMP in the target cell is increased by
0+ cholera toxin
1- Panton-Valentine leukocidin
2- diphtheric toxin
3- shiga-toxin
4- listeriolysin
5+ thermolabile enterotoxin of Escherichia coli
6- enterotoxin of Staphylococcus aureus
7+ pertussis toxin
8+ adenylate cyclase toxin of Bordetella pertussis
9+ oedematous toxin of Bacillus anthracis

1063To the bacterial membranolytic exotoxins belong
0+ alpha-toxin of Clostridium perfringens
1+ beta-toxin of Staphylococcus aureus
2- lipopolysaccharide of G- bacteria
3+ streptolysin-O, pneumolysin and listeriolysin
4- shiga-toxin and shiga-like toxins
5- diphtheric toxin of Corynebacterium diphtheriae
6+ Panton-Valentine leucocidin of Staphylococcus aureus

7- tetanospasmin of Clostridium tetani
8+ tetanolysin of Clostridium tetani
9- epidermolytic toxin of Staphylococcus aureus

1064Tetanospasmin
0+ belongs to neurotoxins
1- causes flaccid paralysis of striated muscle cells
2- has two antigenic types
3+ acts in the CNS
4- predominantly acts on the neuromuscular plate
5+ causes spastic paralysis
6- increases acetylcholine synthesis in the neurons
7+ inhibits release of neurotransmitters at the inhibitory synapses
8+ after inactivation it can be used in toxoid vaccine against tetanus
9- is produced after invasion of C. tetani to the CNS

1065To the enterotoxins belong
0+ cholera toxin
1- TSST-1
2- pyrogenic exotoxin
3+ shiga-toxin
4- tetanospasmin
5- botulinum toxin
6- diphtheric toxin
7- endotoxin
8+ thermolabile and thermostable toxin of ETEC
9+ toxin A and toxin B of Clostridium difficile

1066Enterotoxins are usually produced by the following bacteria
0+ Staphylococcus aureus
1+ Clostridium perfringens
2+ Bacillus cereus
3+ Bacteroides fragilis
4+ Vibrio cholerae
5- Listeria monocytogenes
6- Faecalibacterium prausnitzii
7- Enterococcus faecalis
8- Helicobacter pylori
9- Lactobacillus spp.

1067Non-inflammatory type of diarrhoea is caused by the following toxins
0+ cholera toxin
1+ thermolabile and thermostable enterotoxin of Escherichia coli
2+ enterotoxins of Staphylococcus aureus
3+ emetic toxin and enterotoxins of Bacillus cereus
4+ enterotoxin of Clostridium perfringens
5- beta-toxin of Clostridium perfringens

6- shiga-toxin
7- toxin-B of Clostridium difficile
8- botulotoxin
9- shiga-like toxin of E. coli

1068Toxic shock may be caused by
0+ Staphylococcus aureus strain producing TSST-1
1+ Staphylococcus aureus strain producing enterotoxins
2+ Streptococcus pyogenes strain producing pyrogenic exotoxin
3- release of endotoxin in large amounts to the bloodstream
4- massive destruction of G- bacteria in the bloodstream
5- shiga-toxin during haemolytic-uremic syndrome
6+ bacterial toxin with properties of superantigen
7- cholera toxin – during severe dehydration of organism
8- botulinum toxin – after paralysis of respiratory muscles
9- diphtheric toxin after damage of myocardium

1069On the tissue destruction of the host organism participate
0+ proteolytic and lipolytic enzymes of microorganisms
1+ membranolytic toxins of microorganisms
2+ hyaluronidase of microbial origin
3+ stimulation of granuloma formation by microorganisms
4+ stimulation of acute inflammatory response by microorganisms
5- cholera toxin
6- adhesins of microorganisms
7+ intracellular replication of microorganisms with consequent host cell lysis
8- biofilm matrix
9- bacterial capsules

1070Lytic effect on the host cell have
0+ bacterial leukocidins
1- cholera toxin
2+ shiga-toxin
3- staphylococcal enterotoxins
4- TSST-1
5- epidermolytic toxins of Staphylococcus aureus
6+ diphtheric toxin
7+ listeriolysin, streptolysin and pneumolysin
8- tetanospasmin and botulinum toxin
9+ phospholipase of Clostridium perfringens

1071Mark the correct pairs
0+ botulinum toxin – neurotoxin; flaccid paralysis
1- diphtheric toxin – membranolytic toxin
2+ cholera toxin – dysregulation of ion channels in enterocytes
3- tetanolysin – neurotoxin
4+ tetanospasmin – cleaves synaptobrevin at the inhibitory synapses

5- listeriolysin – neurotoxin
6+ TSST-1 – staphylococcal toxic shock
7- epidermolytic toxin – Streptococcus pyogenes
8+ shiga-toxin - destruction of eukaryotic ribosomes
9+ shiga-like toxin - haemolytic-uremic syndrome

1072Mark the correct pairs
0- cholera toxin - Vibrio parahaemolyticus
1+ Panton-Valentine leukocidin - Staphylococcus aureus
2- diphtheric toxin - Corynebacterium jeikeium
3- pyrogenic exotoxin – Salmonella Typhi
4- pneumolysin – Mycoplasma pneumoniae
5+ thermostable enterotoxin - Escherichia coli
6- exfoliative toxin – Streptococcus pyogenes
7+ TSST-1 – Staphylococcus aureus
8+ adenylate cyclase toxin - Bordetella pertussis
9+ lethal toxin - Bacillus anthracis

1073The process of sterilisation
0+ inactivates or removes all forms if infectious particles
1- inactivates only the pathogenic microorganisms
2- inactivates all infectious particles except to spores and prions
3- inactivates vegetative forms of microorganisms only
4+ can be performed by use of both physical and chemical methods
5- is not acting on persisters and dormant microorganisms
6+ requires higher concentrations of chemicals and longer exposition times
7+ cannot be applied on the skin, mucosae and wounds
8- can be effective only at higher temperatures (over 100 °C)
9+ can be monitored by physical, chemical and biological methods

1074Sterilisation can be achieved by application of
0+ ethylene oxide
1+ gamma irradiation
2+ repeated boiling (fractional sterilisation)
3- iodine povidone acting on the skin and mucosae
4+ cold plasma from H_2O_2 or peracetic acid vapours
5+ steam under pressure in autoclave
6- filtration by filters with pore diameters over 0.45 μm
7- pasteurization
8- prolonged boiling
9+ incineration in the flame (in the case of metal tools)

1075At the doctor office, the following can be used for sterilisation
0+ autoclave
1- gamma-emitter
2+ hot air sterilizer
3+ plasma sterilizer

4- Koch streamer (steam at 100°C)
5+ UV-emitter (only surfaces and the air)
6- boiling water
7- hair-dryer
8- antibiotics
9+ flame of burner

1076Disinfection
0+ substantially reduces the number of contaminating microorganisms
1+ high-level disinfection is not effective against parasite eggs and cysts
2- cannot be performed by any combination of disinfectious agents
3+ inactivates only vegetative forms of microorganisms
4+ is more effective against enveloped than against non-enveloped viruses
5- is not influenced by the structure of disinfected surface
6+ mechanic cleaning increases effectivity of disinfection
7- can efficiently and reliably inactivate pathogenic prion molecules
8- is not able to affect bacteria in biofilm
9- cannot affect nosocomial strains of microorganisms

1077The following can be used for disinfection
0+ boiling
1- gentamicin
2+ oxidising agents
3- glucose in high concentrations
4- rinsing with water
5+ bacteriologic filters
6+ nanoparticles of silver
7- toot-brush
8+ rotation of disinfectants from different groups
9- visible spectrum of sunshine

1078To the disinfectants belong
0- acyclovir
1+ peracetic acid
2+ gaseous chlorine
3- 25 % ethanol
4+ glutaraldehyde
5+ sodium hypochlorite
6- bacitracin
7+ ozone (in some circumstances can also be sterilising)
8- zinc ointment
9+ quicklime (calcium oxide)

1079Antiseptics
0+ are non-toxic, non-irritating and not carcinogenic
1+ they are used in healthcare to treat patients
2- resistance cannot arise to any of them

3+ they do not affect intracellularly localised microorganisms
4+ they can replace antibiotics in local infections in immunocompetent patients
5+ they act non-specifically by reactions with biogenic molecules of microorganisms
6- they act on microorganisms specifically, similarly to antibiotics
7+ they damage biologic membranes, DNA and protein molecules
8- they are not suitable for preoperative preparation of patients
9- they act on all forms of microorganisms

1080To the antiseptic agents belong
0+ several silver compounds
1- amphotericin-B
2+ 3 % solution of hydrogen peroxide
3- gamma irradiation
4+ octenidine
5+ quaternary ammonium salts
6- sodium hypochlorite
7- ethylene oxide
8+ chlorhexidine
9+ iodine povidone

1081Infectious diseases and their sources
0+ infected humans or carriers are sources of anthroponosis
1+ asymptomatically infected human can also be a source of infection
2- humans cannot be infectious during incubation period and convalescence
3+ environment is a source of sapronosis
4- only animal with clinical symptoms can be a source of zoonosis
5- the source of endogenous infection is in the hospital environment
6- agents of exogenous infection originate from the patient´s own microbiota
7- community-acquired infections arise in the community of hospitalised patients
8+ nosocomial infections are contracted in healthcare facilities
9+ iatrogenic infection may arise after non-sterile diagnostic or therapeutic procedures

1082Mark the bacteria that cause zoonoses
0+ Listeria monocytogenes
1- Bordetella pertussis
2+ Francisella tularensis
3+ Salmonella Enteritidis
4- Salmonella Typhi
5- Shigella dysenteriae
6- Treponema pallidum
7+ Leptospira interrogans
8+ Pasteurella multocida
9- Neisseria meningitidis

1083Mark the bacteria that cause anthroponoses
0+ Corynebacterium diphtheriae
1- Corynebacterium ulcerans

2+ Neisseria gonorrhoeae
3- Rickettsia slovaca
4+ Rickettsia prowazekii
5- Anaplasma phagocytophilum
6+ Chlamydia pneumoniae
7- Bartonella henselae
8+ Haemophilus influenzae
9- Chlamydia psittaci

1084Mark the bacteria that cause sapronoses
0+ Legionella pneumophila
1+ Fluoribacter bozemanae and Tatlockia micdadei
2- Actinomyces israelii
3+ Nocardia asteroides
4- Streptococcus pyogenes and Staphylococcus aureus
5+ Mycobacterium marinum and Mycobacterium chimaera
6- Mycobacterium tuberculosis and Mycobacterium leprae
7+ Burkholderia pseudomallei
8- Burkholderia mallei
9- Escherichia coli and Klebsiella pneumoniae

1085Mark the bacteria that commonly cause endogenous infections
0+ Escherichia coli
1+ Streptococcus mutans and Streptococcus sanguis
2- Streptococcus pyogenes
3+ Actinomyces spp.
4+ Bacteroides spp.
5+ Cutibacterium acnes
6- Neisseria gonorrhoeae
7- Salmonella Typhi
8- Corynebacterium diphtheriae
9- Borrelia burgdorferi

1086Mark the typical agents of nosocomial infections
0+ Pseudomonas aeruginosa, Acinetobacter spp. and Stenotrophomonas maltophilia
1- Borrelia recurrentis and Leptospira interrogans
2- Vibrio cholerae and Aeromonas hydrophila
3+ Enterococcus faecium
4- Chlamydia trachomatis and Mycoplasma hominis
5- Treponema pallidum and Neisseria gonorrhoeae
6+ Citrobacter spp. and Enterobacter spp.
7+ Klebsiella spp., Escherichia coli and Proteus mirabilis
8- Erysipelothrix rhusiopathiae and Pasteurella multocida
9+ Staphylococcus aureus

1087The following agents are transmissible by alimentary way
0+ agent of Q-fever (less frequently)

1+ Listeria monocytogenes (frequently)
2- haemophili and neisseriae
3+ Campylobacter jejuni, Salmonella Enteritidis and Yersinia enterocolitica
4- anaplasmae and ehrlichiae (frequently)
5- Neisseria gonorrhoeae
6+ Mycobacterium bovis
7+ brucellae and francisellae
8- borreliae and treponemae (less frequently)
9- only the agents of gastroenteritis and colitis

1088The following microorganisms are transmitted by direct faecal-oral way
0+ various agents of gastroenteritis
1+ "dirty hand diseases" agents
2+ Shigella spp. (bacillary dysentery)
3+ EHEC (bloody diarrhoea and HUS)
4- agents of alimentary toxinoses
5- intestinal tuberculosis
6- gastrointestinal tularemia
7+ salmonellosis agents (in children and immunocompromised people)
8+ Tropheryma whipplei (intestinal lipodystrophy)
9- Clostridium botulinum (botulism)

1089By contaminated water or by contaminated aerosol are transmitted
0+ Leptospira interrogans
1+ Vibrio cholerae and Aeromonas spp.
2+ Mycobacterium marinum a Mycolicibacterium fortuitum
3+ Legionella ssp., Fluoribacter bozemanae and Tatlockia micdadei
4+ Mycobacteroides abscessus complex
5- Treponema pallidum
6- Neisseria gonorrhoeae
7- Rickettsia typhi
8- Borrelia recurrentis
9- Chlamydia trachomatis

1090The following bacteria may be spread by contact with contaminated soil
0+ Nocardia spp.
1- Actinomyces spp.
2+ Streptomyces spp.
3- Haemophilus influenzae
4+ Clostridium tetani
5+ myonecrotic clostridiae
6- Mycoplasma pneumoniae
7- Neisseria meningitidis
8+ Bacillus anthracis
9- Rickettsia spp.

1091The following bacteria are transferred by contaminated hands, items and surfaces

0+ Staphylococcus aureus
1+ Streptococcus pyogenes
2- Treponema pallidum
3- anaplasmae
4+ Clostridium difficile
5- Legionella pneumophila
6+ Corynebacterium diphtheriae
7- rickettsiae
8+ Shigella spp.
9- vibriae

1092The following bacteria can be transmitted transplacentally
0+ Listeria monocytogenes
1- Streptococcus pyogenes
2+ Borrelia burgdorferi
3- Streptococcus agalactiae
4- Escherichia coli K1
5- Salmonella enterica
6+ Treponema pallidum
7- Campylobacter jejuni
8- Shigella sonnei
9+ the agent of syphilis

1093The following bacteria can be transmitted perinatally
0- Helicobacter pylori
1+ Treponema pallidum
2+ Streptococcus agalactiae and Escherichia coli K1
3- Neisseria meningitidis
4+ Listeria monocytogenes
5- Borrelia burgdorferi
6+ Neisseria gonorrhoeae and Chlamydia trachomatis D-K
7- Leptospira interrogans
8+ Candida spp. and Staphylococcus aureus
9- Mycobacterium tuberculosis

1094The following bacteria are sexually transmitted
0+ Neisseria gonorrhoeae
1- Neisseria meningitidis
2+ Treponema pallidum
3- Treponema karateum
4+ Chlamydia trachomatis D-K
5- Chlamydia trachomatis A,B,C
6+ Klebsiella granulomatis
7- Klebsiella pneumoniae
8+ Haemophilus ducreyi
9- Haemophilus influenzae

1095The following bacteria are / can be transmitted by arthropods
0+ ehrlichiae
1+ rickettsiae
2- chlamydiae
3- listeriae
4+ coxiellae
5- legionellae
6- leptospirae
7+ borreliae
8+ francisellae
9- brucellae

1096The following diseases are typically transmitted by respiratory droplets
0- impetigo
1+ pneumonia caused by mycoplasma
2- Lyme borreliosis
3+ diphtheria
4+ epidemic meningitis
5+ whooping cough
6+ tuberculosis
7- campylobacteriosis
8+ plague
9- erysipeloid

1097The following bacteria can be transmitted by contaminated dust
0+ Mycobacterium tuberculosis
1- Neisseria meningitidis
2- Haemophilus influenzae
3+ Bacillus anthracis
4+ Brucella abortus
5- Salmonella Typhi
6- Streptococcus pneumoniae
7+ Chlamydia psittaci
8- Bordetella pertussis
9+ Coxiella burnetii

1098The following microbes are transmissible by contact with warm-blooded animals
0+ Erysipelothrix rhusiopathiae (erysipeloid)
1- Streptococcus pyogenes (erysipelas)
2+ Bacillus anthracis (anthrax)
3- Clostridium botulinum (botulism)
4+ Corynebacterium pseudotuberculosis (granulomatous lymphadenitis)
5- Corynebacterium diphtheriae (diphtheria)
6+ Coxiella burnetii (Q-fever)
7- Rickettsia conorii (Mediterranean spotted fever)
8+ Burkholderia mallei (malleus)
9- Burkholderia pseudomallei (melidiosis)

1099Mark the bacteria transmissible during a bite or scratch by warm-blooded animal

0+ Pasteurella multocida
1+ Bartonella henselae
2- Borrelia burgdorferi
3+ Streptobacillus moniliformis
4- Coxiella burnetii
5- Campylobacter jejuni
6+ Capnocytophaga canimorsus
7- Yersinia pestis
8- Bacillus anthracis
9+ Spirillum minus

1100For local infection is typical that

0+ mucosal secretory sIgA can be produced
1- specific IgM and IgG antibodies can regularly be detected in the serum of patient
2+ skin, mucosa or submucosa is infected
3- there is no need for microbiologic diagnostics of infection
4- empiric antibiotic therapy must always be applied
5+ in some cases, antiseptics can only be used instead of antibiotic therapy
6- the patient is never threatened by risk of infection generalisation
7+ phage therapy can be used
8- blood for antibody detection is collected
9- blood for haemoculture is collected

1101Long-lastingly persisting infection is typical for

0+ lung infections of patients with cystic fibrosis
1+ patients with periimplantitis
2+ infections associated with presence of biofilm
3- streptococcal toxic shock
4+ infections caused by Chlamydia trachomatis
5+ syphilis (Treponema pallidum) and Lyme borreliosis (Borreliella burgdorferi)
6+ Q-fever (Coxiella burnetii) and epidemic typhus (Rickettsia prowazekii)
7- diphtheria (Corynebacterium diphtheriae)
8- legionellosis (Legionella pneumophila)
9- cholera (Vibrio cholerae)

1102Direct microbiologic diagnostics of infectious disease is based on

0+ detection of microbial antigens in the sample
1+ microscopic examination of the sample
2+ cultivation of the sample
3+ isolation of the infectious agent from the sample
4+ detection of the infectious agent nucleic acid in the sample
5+ detection of the infectious agent toxins in the sample
6- detection and quantification of specific antibodies in the sample
7- detection of specific cell-mediated immune response by skin tests
8- detection of IFN-gamma after specific antigenic stimulus in the blood sample

9- IGRA-test for detection of specific cell-mediated immunity

1103Biologic material sampling
0+ depends on the clinical symptoms of the patient
1- should be performed not sooner than after application of the first dose of antibiotic
2+ is performed aseptically, with sterile sampling tools
3- blood for haemoculture is collected in the morning, before the first meal
4+ blood for antibody detection is collected in the morning, before the first meal
5- urine for cultivation can be collected any time; the patient need not to be instructed
6+ the biologic sample must be labelled by patient´s data immediately after collection
7+ during sampling, microbes must not be introduced to the physiologically sterile places
8- the request form need not contain data about the sample type or about the therapy
9- it can always be performed also by the patient himself

1104Bacteriologic transport media
0- support multiplication of bacteria
1+ support the vitality of bacteria
2+ keep bacteria in the same qualitative and quantitative state as at the sampling
3- are enriched by bacterial nutrients
4+ contain semisolid agar base with buffer and may contain charcoal as well
5+ they protect bacteria from desiccation during transport
6- they are not necessary for transport of anaerobic bacteria
7- they are necessary for transport of cerebrospinal fluid
8+ they are not necessary for transport of stool
9- transport media are not necessary for transport of swabs

1105Mark the correct pairs
0+ septic meningitis – blood and liquor for culture
1+ aseptic meningitis – blood and liquor for antibody detection
2+ urethritis - urethral swab; firs stream of urine
3- cystitis – first stream of urine
4- otitis media - nasopharyngeal swab
5- viral diarrhoea – rectal swab
6+ bacterial diarrhoea – rectal swab
7+ intestinal parasitosis or viral diarrhoea - stool sample
8- cervicitis – blood for antibody detection
9- operation wound infection – superficial swab of the wound

1106Mark the correct pairs
0- hard painless genital ulcer – swab for culture
1+ soft painful genital ulcer – swab for culture
2+ otitis media – pus from the middle-ear area
3- septic meningitis – blood and liquor for antibody detection
4+ septic meningitis – liquor for microbial antigens detection
5- aseptic meningitis – liquor for culture
6- diarrhoea – blood for antibody detection
7- pneumonia – oropharyngeal swab for culture

8+ pneumonia – sputum and blood for culture
9- endophthalmitis – conjunctival swab

1107Macroscopic evaluation of the biologic sample
0+ turbid liquor - septic meningitis
1+ blood and mucus in diarrhoeal stool – suspected dysentery
2- diarrhoeal greasy stool – suspected cholera
3+ haemolytic serum – the sample is not suitable for serologic analysis
4- turbid liquor – viral meningitis
5- viscous greenish sputum sample – only saliva was collected
6+ bloody and viscous sputum sample – correctly sampled material
7+ thin translucent sputum sample – only saliva was probably collected
8- foul-smelling pus – the presence of anaerobic bacteria can be excluded
9+ turbid, foul-smelling midstream urine – suspected cystitis

1108To the samples routinely examined by microscopy belong
0+ liquor
1+ sputum
2+ materials from physiologically sterile places of organism
3- tonsillar and nasopharyngeal swab
4- rectal swab
5+ stool sample (for parasitological examination)
6- stool sample (for bacteriologic examination)
7+ cervical, vaginal and urethral swab
8- blood immediately after collection
9+ haemoculture (after positivity signalling)

1109The following is applied during Gram staining
0+ fixation of the preparation
1- staining by concentrated carbolfuchsin
2- heating of the preparation during staining
3+ staining by crystal violet
4+ application of Lugol iodine solution
5+ decolorization by acetone
6- decolorization by acid alcohol
7+ rinsing with water
8- counter-staining by methylene blue
9+ counter-staining by diluted carbolfuchsin

1110The following is applied during Ziehl-Neelsen staining
0+ heat fixation of the preparation
1- fixation by alkalines
2+ staining with concentrated carbolfuchsin
3- staining with concentrated crystal violet
4+ heating the preparation during staining until vapours are produced
5- fixation by Lugol iodine solution
6+ decolorization by acid alcohol

7- decolorization by acetone
8+ staining by malachite green
9- counterstaining by diluted carbolfuchsin solution

1111Hot concentrated solution of malachite green is used for
0- staining of bacterial capsules
1- visualisation of intracellular bacteria
2+ staining of Bacillus spp. spores
3+ staining of Clostridium spp. spores
4- detection of acid-fast bacteria
5- detection of flagellae
6- study of encapsulated bacteria
7+ study of spore-forming bacteria
8- staining of mycobacteria
9- counterstaining of the background of mycobacteria

1112Burri method
0- is used for staining of acid-fast bacteria
1+ can be combined with monochromatic staining of bacterial cells
2- is a fixation method by Burri solution
3- is used for visualisation of bacterial spores
4- is used for study of intracellular bacterial storage granules
5+ visualises bacterial capsules in fixed preparation
6+ its modification is a wet-mount India-ink preparation
7+ uses India-ink, producing dark background of encapsulated microorganisms
8- is used for legionellae detection in sputum
9+ is used for detection of cryptococci in the cerebrospinal fluid

1113Giemsa staining can be used for
0- microscopic detection of capsules
1+ detection and identification protozoal parasites
2- staining of chitin in the cell-wall of fungi
3- microscopic diagnostics of spirochaetes
4- microscopic detection of acid-fast bacteria
5+ microscopic detection of intracellular bacteria
6+ microscopic detection of morulae formed by ehrlichiae
7- staining of peptidoglycan
8+ detection of anaplasmae in granulocytes
9+ detection of intracellular chlamydial reticulate bodies

1114Cultivation of clinical sample is performed in order to
0- evaluate the virulence of microbes in the sample
1+ isolate the agent of disease from the sample
2+ obtain a pure microbial culture for the further analysis
3+ detect the general growth and metabolic properties of microbes in the sample
4+ multiply microorganisms, which are present in the sample
5- evaluate the pathogenicity of microorganisms in the sample

6- detect resistance genes
7- detect the antigenic specificity of microorganisms in the sample
8+ evaluate the proportion of the particular microbes present in the sample
9+ preliminarily identify microorganisms (e.g. on the chromogenic media)

1115To the selective or diagnostic media for intestinal pathogens belong
0- Schaedler agar
1+ alkalic peptone water
2- Levithal medium
3+ selenite broth
4- Sabouraud medium
5- blood agar
6- chocolate agar
7+ media that contain lactose
8+ MacConkey agar
9+ deoxycholate-citrate agar

1116Lactose is cleaved by the majority of the strains of the following intestinal bacteria
0+ Escherichia spp.
1+ Enterobacter spp.
2+ Klebsiella spp.
3+ Cronobacter spp.
4+ Citrobacter spp.
5- Shigella spp.
6- Yersinia spp.
7- Salmonella spp.
8- Morganella spp.
9- Proteus spp.

1117The following bacteria can cause beta-haemolysis on blood agar
0- Streptococcus salivarius
1+ Streptococcus pyogenes
2+ Streptococcus agalactiae
3- Streptococcus mutans
4+ Escherichia coli
5+ Staphylococcus aureus
6+ Pseudomonas aeruginosa
7- Proteus mirabilis
8+ Listeria monocytogenes
9- Salmonella Enteritidis

1118Mark the correct pairs of medium with a bacterium
0- blood agar – Francisella tularensis
1+ Levinthal agar – Heamophilus influenzae
2+ Clauberg tellurite medium - Corynebacterium diphtheriae
3+ BCYE agar (with cysteine and iron salts) - Legionella pneumophila
4+ Korthof medium - Leptospira interrogans

5- chocolate agar - anaerobic bacteria
6- Mueller-Hinton medium – Mycobacterium tuberculosis
7- Middlebrook medium – Mycobacterium leprae
8- Löwenstein-Jensen medium - Mycoplasma pneumoniae
9+ thiosulfate-citrate-bile-sucrose agar (TCBS) - Vibrio cholerae

1119To the rapid methods of microbiologic diagnostics belong
0+ microscopic examination of the sample
1+ microbial antigen detection in the sample
2+ microbial genome detection in the sample
3- culture of the sample
4- detection of specific cell-mediated immunity by skin tests
5- detection of specific cell-mediated immunity by IGRA
6+ detection of resistance genes in the sample
7+ detection of infectious agent in the sample by MALDI-TOF MS
8- detection of toxic activity of bacteria on the tissue culture
9+ bacterial toxins detection in the sample by immunochemical methods

1120Susceptibility to antimicrobial drugs
0- can be detected only in the case of bacteria and fungi
1+ can be detected by sequencing of viral genome (in the case of HIV)
2- is tested in all cases of suspected infectious disease
3+ in severe systemic infections, quantitative susceptibility testing should be performed
4- it is routinely detected in Rickettsia, Bartonella, Legionella, Chlamydia and spirochaetes
5- it cannot be tested in anaerobic bacteria
6+ is not tested in parasites
7- cannot be tested by methods yielding results in less than 24 hours
8+ in immunodeficient patients should be tested by quantitative assays
9+ should be tested in all strains from nosocomial infections

1121Routine indirect microbiologic diagnostics of infectious diseases
0+ is based on detection of specific antibody in serum, plasma, or liquor of patient
1- is based on detection of specific antibody in stool or urine of the patient
2+ can be complemented by antibody detection in saliva, tears or intraocular fluid
3+ results of antibody detection by ELISA may require confirmation by Western-blot
4- antibody detection by ELISA never requires confirmation by Western-blot
5+ is based on detection of IFN-gamma release by Th-Ly on specific antigenic stimulus
6- is based on detection of complement activation by specific antigenic stimulus
7- is based on detection of microbial antigens in serum, plasma, or liquor of patient
8- is based on detection of microbial genome in serum, plasma, or liquor of patient
9- is used only in diagnostics of acute infections

1122Specific antibody against the infectious agents
0+ may help in microbiologic diagnostics of chronic infections
1- may be helpful in diagnostics of acute purulent infections
2+ may help in diagnostics of systemic and generalized infections
3+ are produced also during inapparent infection

4+ are used in epidemiological population surveys of immunity
5+ is detected in paired samples of serum and liquor during viral meningitis
6- is detected in stool during intestinal parasitoses
7- is detected in blood during systemic aspergillosis of patients after transplantation
8- is detected in diagnostics of tuberculosis
9- cannot be used in the diagnostics of intrauterine infections

1123The diagnosis of acute infectious disease is supported by
0- detection of any amount of specific IgG antibodies
1+ seroconversion detected in paired serum samples
2+ at least 4-fold increase of specific antibody titre in paired serum samples
3- decreasing titre of specific antibody in paired serum samples
4+ detection of specific IgM antibodies
5- detection of specific IgM antibodies, persisting for more than 1 year
6- presence of specific IgG and at the same time not detectable specific IgM antibodies
7+ detection of specific IgG antibodies with low avidity
8- detection of specific IgG antibodies with high avidity
9- long-lastingly persisting specific IgG antibodies

1124To the serological reactions which use labelled antibodies belong
0+ ELISA (enzyme-linked immunosorbent assay)
1+ RIA (radioimmunoassay)
2+ Western-blot
3- hemagglutination
4+ direct and indirect immunofluorescence
5- complement-fixation reaction
6- immunoturbidimetry
7- immune nephelometry
8- passive hemagglutination
9- virus-neutralisation test

1125ELISA
0+ can be used for antigen detection in the sample
1+ can be used for specific antibody detection in the sample
2+ is highly susceptible, but may have a lower specificity
3+ results may need confirmation by immunoblot to exclude a non-specific reactivity
4+ enables to detect specific antibodies of the particular classes of immunoglobulins
5- is highly reliable in detection of specific IgM antibodies
6- is not reliable in detection of specific IgG antibodies
7- cannot be used in detection of specific IgG antibody avidity
8- can detect antibodies only in the samples of serum
9- detects the titres of specific antibodies or microbial antigens

1126The presence of specific IgM antibody in serum is typical for
0+ early phase of infectious disease
1- late, post-infectious immunity
2+ intrauterine infection

3- carrier state
4- states in which microbial antigens persist in the bloodstream
5- inapparent infection in the past
6+ response to the T-independent antigens (e.g. to polysaccharides of bacterial capsules)
7- active immunisation by conjugated polysaccharidic vaccine
8+ acute or reactivated infection
9+ acute primoinfection

1127Detection of specific antibody is used in the diagnostics of
0+ reactive arthritis
1- acute septic arthritis
2+ rheumatic fever
3+ aseptic meningitis
4- septic meningitis
5+ atypical pneumonia
6- non-gonococcal urethritis and cervicitis
7- viral diarrhoea
8+ generalised and systemic viral infections
9+ tissue helminthiases

1128Indirect microbiologic diagnostics is routinely used in diagnostics of
0+ atypical pneumonia
1- salmonellosis
2- gonorrhoea
3+ typhoid fever
4- actinomycosis
5+ syphilis
6+ Lyme borreliosis
7+ brucellosis
8- cholera
9- chlamydial urethritis

1129The specific cell-mediated immunity
0+ can be detected by skin test
1+ can be detected by IFN-gamma production by Th-cells after specific antigenic stimulus
2+ is characteristic by delayed-type hypersensitivity to antigens of the disease agent
3- is characterised by immediate hypersensitivity to antigens of the disease agent
4+ can be detected by IGRA
5- is confirmed by western-blot
6- is confirmed by increased level of CRP
7+ is used for diagnostics of tuberculosis
8- is used for diagnostics of acute purulent infections
9- can be reliably detected also in patients with HIV/AIDS

1130Infectious diseases presence is supported by the following laboratory results
0+ isolation of primarily pathogenic microorganism in the sample from infectious focus
1+ microscopic detection of microbes of one morphotype and PMNL in the sample

2- microscopic detection of bacteria of various morphotype in mucosal swab
3+ massive growth of an opportunistic pathogen in the culture of mucosal swab
4- culture of opportunistic pathogen in small numbers in mucosal swab
5+ culture of opportunistic pathogen in small numbers in physiologically sterile sample
6- positive qualitative PCR from blood in patient with suspected CMV disease
7+ detection of high viral load in blood of patient with suspected CMV disease
8+ any amount of specific anti-HIV antibody
9- any amount of specific IgG antibody in 1 sample of serum (except to anti-HIV)

Bakteriológia

2001Streptococci
0+ are Gram-positive cocci arranged in chains
1- are strictly anaerobic
2- are very well susceptible to aminoglycosides
3+ aminoglycosides act on streptococci in combination with beta-lactams
4+ their typing is based on polysaccharidic substance in their cell-wall
5- all streptococci are typable according to Lancefield
6- under a microscope they appear in form of G+ cocci, arranged in clusters
7+ blood agar is their diagnostic medium
8- all species of Streptococcus belong to microbiota of healthy humans
9+ they produce ATP in process of fermentation

2002Streptococcus pyogenes can cause
0- dental caries
1+ tonsillopharyngitis
2+ erysipelas
3- endocarditis lenta
4- the majority of urinary tract infections
5+ rheumatic fever
6+ impetigo
7- epidemic meningitis in children
8+ scarlet fever
9+ phlegmons in operation wounds and postpartum infections

2003Rheumatic fever (RF) and acute poststreptococcal glomerulonephritis (GN)
0+ RF is a sequel of infection caused by Streptococcus pyogenes (group A)
1- RF may arise after infection caused by all beta-haemolytic streptococci
2+ GN can arise also after skin infection caused by Streptococcus pyogenes
3+ during these diseases, elevated levels of ASO are detected
4+ RF can arise only after tonsillitis or pharyngitis caused by Streptococcus pyogenes (A)
5- RF and GN appear one week after the onset of streptococcal infection
6- causal therapy of RF and GN is penicillin in high doses
7- these diseases most frequently affect children of the age around 3 years
8- these diseases regularly appear in S. pyogenes carriers
9+ RF and poststreptococcal GN have immunopathological background

2004To the laboratory diagnostics of post-streptococcal non-suppurative diseases belong

0+ quantification of antistreptolysin-O in the serum of patient
1- quantification of ASO in urine of patient with acute poststreptococcal glomerulonephritis
2- urine culture patient with acute poststreptococcal glomerulonephritis
3- quantification of antistreptolysin-S in the serum of patient
4- detection of pyrogenic exotoxin in serum of patient
5+ erythrocyte sedimentation rate detection (ancillary test)
6+ detection of anti-streptodornase (anti-deoxyribonuclease-B) in the serum of patient
7+ quantification of CRP levels (non-specific marker of inflammation)
8- detection of antibodies against pyrogenic exotoxin
9- detection of the disease agent in synovial fluid or urine by MALDI-TOF MS

2005The following is characteristic for non-group-A of beta-haemolytic streptococci

0+ beta haemolysis on blood agar can be caused by streptococci of the groups B, C, F and G
1- all have positive CAMP-test
2+ S. agalactiae colonises vaginal and rectal mucosa of humans
3- S. dysgalactiae is isolated only from animals
4+ S. anginosus colonises oropharynx and urogenital mucosa of healthy humans
5+ S. agalactiae is the most frequent agent of neonatal meningitis
6- vaccine against S. agalactiae is included in the regular vaccination scheme
7+ S. dysgalactiae has similar virulence factors as S. pyogenes (group A)
8- all beta-haemolytic streptococci may trigger rheumatic fever
9- S. anginosus may initiate poststreptococcal glomerulonephritis

2006Streptococcus pneumoniae

0+ capsule is the most important virulence factor of this bacterial species
1+ antibodies against pneumococcal capsular antigens are protective
2- is the common agent of pneumonia of immunocompetent adult people
3+ is the most frequent agent of otitis media in childhood
4+ can cause meningitis in children and predisposed adults
5+ is a frequent agent of secondary bacterial pneumonia during influenza
6- is usually transmitted also transplacentally
7- isolation of S. pneumoniae from upper respiratory tract is always clinically relevant
8- all strains of S. pneumoniae are well susceptible to penicillin
9- pneumococcal infections are not preventable by vaccination

2007Viridans streptococci

0+ regularly colonise oropharynx of humans
1+ biofilm production belongs to their important virulence factors
2+ can initiate dental caries
3+ are important agents of subacute bacterial endocarditis
4- do not colonise urogenital mucosa of humans
5+ are important agents of peri-implantitis
6- are common agents of tonsillitis and pharyngitis
7- produce membranolytic toxins
8- S. pneumoniae does not belong to them
9- are agents of meningitis of immunocompetent adults

2008Enterococci
0+ have low virulence and cause opportunistic infections
1- reservoir of enterococcal infections are animals
2- are transmissible by parenteral way
3+ are the third most frequent agents of infectious endocarditis
4+ may cause urinary tract infections and prostatitis
5+ may participate in cholecystitis and abdominal infections
6- can cause gastroenteritis
7- can trigger reactive arthritis
8+ E. faecium may be resistant to ampicillin and vancomycin
9- monotherapy by ampicillin is effective in the therapy of enterococcal endocarditis

2009Staphylococci
0+ are Gram-positive cocci in clusters
1- are microaerophilic
2- grow only on special enriched culture media
3- all staphylococcal species produce both catalase and coagulase
4+ are good biofilm producers
5+ colonise skin and mucosae of humans and animals
6+ are opportunistic pathogens
7+ can survive in hospital environment
8+ are the most frequent agents of infectious endocarditis
9- only seldom colonise surfaces of intravenous catheters and endoprostheses

2010Staphylococcus aureus
0+ can cause pyogenic infections with abscess production
1+ can cause post-antibiotic diarrhoea
2+ can cause food intoxication
3- cannot cause toxic shock
4+ is a frequent agent of wound infections
5- can cause erysipelas
6+ can cause impetigo
7- is a frequent agent of subacute endocarditis
8- is a frequent agent of non-complicated cystitis
9+ is transmitted by direct and indirect contact and by respiratory droplets

2011The following agents are usually effective in the therapy of infections caused by MRSA
0+ vancomycin
1+ therapeutic phages
2+ daptomycin
3+ ceftaroline
4- aminopenicillins combined with inhibitors of beta-lactamases
5- oxacillin
6- macrolides
7+ linezolid

8- carbapenems
9- ethambutol

2012Coagulase-negative staphylococci
0+ are frequent agents of implant-associated endocarditis
1+ cause periimplantitis
2+ are frequent agents of catheter-related sepsis
3- all strains are well susceptible to methicillin and oxacillin
4+ S. saprophyticus is the agent of primary urinary tract infections
5- S. epidermidis is the cause of staphylococcal scalded skin syndrome in neonates
6+ can elicit shunt-associated meningitis
7- cause nosocomial infections only rarely
8+ frequently contaminate samples obtained from skin and mucosae
9- are agents of post-antibiotic diarrhoea

2013Bacillus anthracis
0+ enters to the body through skin breaks, by inhalation or ingestion
1- biofilm belongs to its most important virulence factors
2+ has polypeptide capsule with antiphagocytic activity
3+ anthrax toxin has adenylate-cyclase and proteolytic activities
4- it causes pyogenic infections wit production of abscesses
5+ it is a potential bioterrorism agent
6- is a frequent agent of nosocomial infections
7- all strains are susceptible to penicillin
8- it is fastidious
9+ cultivation of B. anthracis on laboratory media requires biosafety level 3

2014Anthrax
0- Northern Europe is an important endemic area of anthrax
1- infected humans are the most common source of anthrax
2- processing of wool or leather of infected animals cannot lead to infection
3+ incubation period lasts from 2 to 7 days
4+ pustula maligna (a focal necrotic lesion) is the typical presentation of cutaneous anthrax
5+ both pulmonal and intestinal anthrax have extremely high lethality
6- microbiologic diagnostics of anthrax is based on specific antibody detection
7+ fluoroquinolones, tetracyclines, macrolides or lincosamides can be used in therapy
8- it is not necessary to provide post-exposition antibiotic prophylaxis of anthrax
9+ vaccine can be used in anthrax prevention

2015Bacillus cereus
0- is primarily zoopathogenic
1+ spores of B. cereus contaminate rice and other cereals
2+ is able to produce emetic toxin and several kinds of enterotoxins
3+ it can cause self-limiting food-poisoning
4- diarrhoea caused by B. cereus must be treated by antibiotics
5- food-borne diarrhoea caused by B. cereus is preventable by toxoid vaccine
6+ through damaged cornea it can infect the eye and rapidly destruct eye structures

7- bacillar eye infections cannot be treated due to insufficient intraocular ATB penetration
8+ disseminated infections causes only in immunocompromised patients
9- invasive infections caused by B. cereus can be treated by penicillins and cephalosporins

2016Listeria monocytogenes
0+ it is a G+ facultatively anaerobic rod, motile at 4°C
1+ can grow and multiply also in the refrigerator
2+ is the agent of zoonosis, transmissible to humans by alimentary way
3+ can intermittently colonise the human intestinal and vaginal mucosa
4- can produce enterotoxins with adenylate-cyclase activity
5- survives pasteurisation of the food products
6+ membranolytic listeriolysin and phospholipases are its virulence factors
7+ multiplies intracellularly in the cytoplasm of macrophages
8- antibodies and PMNL are most important for protection from listeriosis
9- inside the human body is well susceptible to cephalosporins

2017Listeria and listeriosis
0+ may cause severe infections in people with decreased cell-mediated immunity
1+ can cause sepsis and meningitis in neonates and immunocompromised people
2- perinatal listeriosis has not yet been observed
3+ can cause abortion or generalised congenital infection after transplacental transmission
4- mostly produces clinical symptoms also in immunocompetent adults
5+ the most usual clinical symptom of listeriosis is a non-specific flu-like illness
6- is a common agent of diarrhoea
7- routine microbiologic diagnostics of listeriosis is based on specific antibody detection
8- therapy of listeriosis is based on 3rd generation cephalosporins
9+ listeriosis is treated by ampicillin, which may be combined with gentamicin

2018Erysipelothrix rhusiopathiae (part I)
0+ is a facultatively anaerobic Gram-positive non-spore-forming rod
1- is the agent of endemic disease
2- is rapidly inactivated by environmental factors
3- is colonising the water-tube systems in hospitals
4+ the most frequent infectious source of Erysipelothrix are pigs
5+ capsule and neuraminidase are its most important virulence factors
6+ can cause professional infections after contact with animals or animal products
7- can be transmitted by alimentary way
8- can transplacentally infect the human foetus
9+ requires prolonged cultivation on blood agar in increased CO_2 tension

2019Erysipelothrix rhusiopathiae (part II)
0+ invades the host through skin breaks
1+ it causes skin lesions; the infection may locally spread to joints
2+ the diffuse skin forms of infection usually have also systemic symptoms
3+ it can cause subacute endocarditis
4- is a common agent of atypical pneumonia
5- skin swabs are collected for the microbiologic diagnostics

6- blood cultures in Erysipelothrix-caused sepsis and endocarditis are regularly negative
7- routine laboratory diagnostics is based on specific antibody detection
8+ penicillin, cephalosporins, fluoroquinolones or clindamycin may be effective in therapy
9- vaccination of animals is not available

2020Mycobacteria
0+ are acid-fast coccoid to filamentous rods, arranged in clumps (cords)
1+ are facultatively intracellular, non-motile and do not form spores
2- are inactivated by low concentrations of hydroxides and by alcohol solutions
3+ are inactivated by phenolic compounds and by the UV light
4+ have a long generation time and a slow growth
5- all mycobacteria can grow on laboratory culture media
6+ are agents of both sapronoses, zoonoses and anthroponoses
7- to them belong only a single genus - Mycobacterium
8- they all are water and soil saprophytes and opportunistic pathogens of humans
9- only tuberculous mycobacteria can infect humans

2021Mycobacterium tuberculosis
0+ its acid-fast cell wall is an important virulence factor
1+ its generation time is as long as 18 to 24 hours
2+ stimulates tuberculoma formation in the body of the host
3- stimulates pyogenic infection with abscess formation in the body of the host
4+ can long-lastingly persist in the dormant tuberculous focuses
5+ non-active mycobacteria are eradicated by pyrazinamide and bedaquiline
6- has a rather high infectious dose
7- has affinity only to the lung tissue
8- is always susceptible to rifampicin and isoniazid
9- small children it can infect only asymptomatically

2022Tuberculosis (TBC)
0- is an acute pyogenic infection
1- is clinically manifested in the majority of infected persons
2- fever, night sweating and wasting is a direct toxic effect of mycobacterium
3+ activity of TBC process is expressed in the intensity of delayed hypersensitivity (skin test)
4+ latent TBC can reactivate during biologic anti-TNF treatment
5+ protective immunity against tuberculous mycobacteria is predominantly cell-mediated
6- BCG vaccine protects from infection caused by tuberculous mycobacteria
7- clinical outcome of TBC depends on the presence of protective antibodies
8+ TBC is treated by combination of various antituberculotic drugs
9+ TBC therapy should be prolonged (several months)

2023Microbiologic diagnostics of tuberculosis is based on
0+ semiquantitative microscopic detection of acid-fast rods in the sample
1- detection of mycobacterial antigens in liquor and blood of patient
2+ detection of nucleic acid of the TBC agent in various types of samples
3- isolation of the TBC agent from the sputum sample on blood agar
4+ isolation of the TBC agent from the sputum sample in Middlebrook medium

5- definitive culture result reporting after a 3-weeks cultivation of the sample
6- susceptibility testing by a disk-diffusion test
7+ susceptibility testing by a proportion test
8+ detection of mutations responsible for resistance to antituberculotic drugs
9+ detection of specific cell-mediated immunity by IFN-gamma-release assay

2024Non-tuberculous mycobacteria
0+ usually cause disease only in immunocompromised and predisposed patients
1- are transmitted by interhuman contact
2- do not cause nosocomial infections
3- are transmitted only by a respiratory way
4- the majority of them is well susceptible to the first-line antituberculotics
5+ M. gordonae and M. phlei can contaminate microbiologic laboratories
6+ Mycobacterium kansasii is endemic in miner and metallurgical areas
7+ M. chimaera and M. xenopi may contaminate hospital air-conditioning systems
8- Mycobacterium ulcerans is cosmopolitan and causes primary lung infections
9+ Mycobacterium marinum is the agent of fish-tank granuloma

2025Mycobacterium leprae and leprosy
0+ leprosy is transmitted after prolonged close contact with infected person
1+ incubation period of leprosy may be as long as 20 years
2+ it invades to Schwann-cells and causes demyelination of nerve sheaths
3- after infection it usually disseminates to all organs and tissues
4- it forms visible colonies on culture media after prolonged cultivation
5- lepromatous form of leprosy has better prognosis than tuberculoid form
6+ lepromatous leprosy has the highest infectiousity
7+ combination of drugs applied at least for 12 months is used for treatment
8- specific vaccine against leprosy is available in endemic areas
9- specific antibody protects from both recidivation and reinfection by leprosy

2026Nocardiae
0+ have filamentous, intensively branching cells
1+ contain mycolic acids in the cell wall and are weakly acid-fast
2+ in microscopic preparation resemble actinomycetes
3+ have aerobic metabolism
4- grow rapidly, but require special culture media
5- are primarily pathogenic for humans
6+ belong to sapronotic agents
7- cause endemic diseases
8- are resistant to 3rd generation cephalosporins, aminoglycosides and imipenem
9- they have Gram-negative cell wall

2027Nocardia and nocardiosis
0+ enter do the body by respiratory way or through the broaken skin barrier
1+ nocardiae may disseminate from the primary cutaneous focus to lungs
2+ Nocardia may cause brain abscess
3- Nocardia may cause septic meningitis

4- nocardiosis is an endogenous infection
5+ Nocardia can initiate mycetoma formation, clinically similar to eumycetoma
6+ isolation of Nocardia from physiologically sterile sample is always clinically relevant
7+ empiric treatment of nocardiosis is based on sulphonamides or co-trimoxazole
8- therapy of nocardiosis is short-lasting and never requires antimicrobial drug combination
9- nocardiosis can be prevented by vaccination

2028Actinomyces species I
0+ are G+ branching filamentous rods
1- are weakly acid-fast
2+ grow slowly in anaerobic of microaerophilic conditions
3+ have only a low virulence
4- cause exogenous infections
5+ colonise mucosae of humans and animals
6+ massively colonise sulcus gingivalis in people with insufficient oral hygiene
7- A. israelii and A. odontolyticus are isolated from oral cavity only during periodontitis
8- colonise the skin and may contaminate haemocultures
9- cause acute pyogenic infections

2029Actinomyces species II
0+ invade to the human body through damaged mucosa
1+ cause cervicofacial, abdominal and pelvic actinomycosis
2- cervicofacial actinomycosis develops after haematogenous spread
3- are not able to infect lungs
4+ produce granulomatous lesions, leaking through fistulae pus with sulphur granules
5+ microscopic examination of pus has a diagnostic role in actinomycosis
6- produce visible colonies on blood agar after 48-hours cultivation
7- therapy of actinomycosis is always only conservative - antibiotic
8+ therapy of actinomycosis is based on prolonged application of penicillin
9- metronidazole or tetracyclines are the second choice for actinomycosis treatment

2030Corynebacteria
0+ are Gram-labile irregular rods
1+ colonise the human skin and mucosa
2- all strains of corynebacteria species have very low virulence
3- cannot grow on blood agar
4+ frequently contaminate haemocultures and swabs from wounds and mucosae
5+ well survive on dry areas of the skin
6+ can produce biofilm and colonize foreign bodies in the patient's body
7- all species can produce diphtheric toxin
8- from nosocomial infections are isolated only rarely
9- can infect only humans

2031Corynebacterium diphtheriae, diphtheric toxin and diphtheria
0+ C. diphtheriae is a non-invasive toxigenic bacterium
1- diphtheric toxin is produced by all strains of C. diphtheriae
2+ C. diphtheriae can infect wounds and mucosae

3- diphtheric toxin has membranolytic activity
4+ diphtheria is typical with pseudomembrane forming and airway obstruction
5+ diphtheric toxin is neuro-, nephro- and cardiotoxic
6- diphtheric toxin acts only locally, at the site of infection
7- laboratory diagnostics of diphtheria is based on detection of any strain of C. diphtheriae
8- laboratory diagnostics of diphtheria is based on specific antibody detection
9+ antitoxic antibodies protect from diphtheria

2032Neisseria gonorrhoeae and gonorrhea
0+ can be transmitted to newborn during delivery
1+ causes acute purulent inflammation
2- neonatal gonococcal conjunctivitis is not preventable
3+ microscopic examination has diagnostic role in gonorrhoea
4+ is very fastidious
5+ laboratory isolation of N. gonorrhoeae is reportable
6- only a sexual partner with clinical symptoms of gonorrhoea should be treated
7- empiric treatment of gonorrhoea is based on application of penicillin
8- infection by N. gonorrhoeae stimulates long-lasting protective immunity
9- vaccine against gonorrhoea is available for sexually promiscuous persons

2033Mark the samples suitable for microbiologic diagnostics of gonorrhoea
0+ cervical swab
1+ urethral swab
2- urine by suprapubic puncture
3+ synovial fluid in arthritis
4- blood for N. gonorrhoeae antigen detection in ovarian abscess
5+ blood for haemocultivation in disseminated form of gonorrhoea
6- blood for detection of specific antibodies in pharyngeal gonorrhoea
7+ swab from infected mucosa; transport medium should be used
8- liquor in ascendent gonorrhoea
9- stool in gonococcal proctitis

2034Neisseria meningitidis
0- is a facultatively anaerobic G- rod
1- is motile (it has polar flagella)
2- is not fastidious and can multiply also at 4 ° (in refrigerator)
3+ is susceptible to desiccation
4- it can sporulate in adverse environmental conditions
5+ is transmitted by respiratory way during close contact
6+ polysaccharide capsule is the main virulence factor of N. meningitidis
7+ lipooligosaccharide alters the function of vascular endothelium during sepsis
8+ meningococci in blood are inactivated by complement
9- N. meningitidis causes each year large epidemics in the EU

2035Neisseria meningitidis and meningococcal meningitis (MM)
0+ N. meningitidis is the agent of epidemic meningitis
1+ source of infection are ill people or asymptomatic carriers

2- MM has aseptic character
3+ untreated MM has almost 100% lethality
4- petechiae on skin are formed during meningococcal sepsis only in children
5+ for microbiologic examination, liquor and blood for haemoculture are collected
6- close contacts of patients with MM need not to be examined
7+ initial therapy of MM is based on 3rd generation cephalosporins
8- antibiotics in MM should be applied only after confirmation of diagnosis by a culture
9- there is no vaccine against N. meningitidis of serotype-B

2036Diagnostics of meningococcal meningitis (MM)
0- liquor for cultivation should be cooled during the transport
1+ antigens of N. meningitidis can be detected in liquor
2+ G- diplococci and many PMNLs are visible in microscopic preparation of liquor
3- N. meningitidis grows both on blood agar and selective media for G- intestinal bacteria
4+ biochemical identification should be followed by typing of isolated N. meningitidis
5+ antimicrobial susceptibility should be tested by quantitative techniques
6+ liquor for analysis by PCR should be kept in cold conditions
7- analysis of biologic material by PCR is routinely performed in all patients
8- if the PCR analysis is positive, there is no need for cultivation of the sample
9- acute stage of MM is confirmed by detection of specific antibody in liquor

2037Enterobacteriales
0+ have high biochemical activity
1- all species have flagella and are motile
2+ among them are strains that produce ESBL and carbapenemases
3+ the majority of species can be serotyped according to their O- or H-antigens
4+ typhoid salmonellae produce a microcapsular Vi-antigen
5- do not include species primarily pathogenic to humans
6- have the only virulence factor - production of enterotoxins
7- all species are opportunistic pathogens
8- can infect only the intestinal tract
9+ many strains of Enterobacteriales are important nosocomial agents

2038Escherichia coli
0+ is a part of intestinal microbiota in healthy humans
1+ some strains can cause gastroenteritis
2- can cause perinatally transmitted gastroenteritis
3+ E. coli K1 is the agent of neonatal meningitis
4+ is the most frequent agent of urinary tract infections
5- only rarely is isolated from nosocomial infections
6- strains of ETEC are world-wide spread
7+ strains of EHEC have low infectious dose and can cause acute kidney failure
8- microbiologic diagnostics is based on specific antibody detection in blood
9- serotyping of E. coli from stool of children with diarrhoea does not have diagnostic role

2039Salmonella
0+ is more susceptible to acidic gastric environment than Shigella

1- low stomach acidity (by therapy, in babies) increases the infectious dose of salmonellae
2+ is invasive and in human body multiplies intracellularly
3+ in macrophages can spread to various localities of the body
4+ people with low acidity in stomach have higher risk of salmonella infections
5- can cause dysenteriform diarrhoea
6- infects large intestine
7- is able to cause intestinal infections only
8- is living saprophytically in water and soil
9+ has more than 2500 serotypes

2040Non-typhoid salmonellae
0+ cause inflammatory type of diarrhoea
1- regularly invade from intestinal submucosa to the bloodstream
2+ animals are the primary source of salmonellosis
3+ may infect small children after contact with colonised lizard pets
4+ are transmitted by eggs and non-pasteurised meat- and milk-products
5- cannot be transmitted to humans by contaminated fruits or vegetables
6+ can cause sepsis, osteomyelitis, aortitis, cystitis or meningitis
7- invasive salmonelloses have a self-limiting course
8- gastroenteritis caused by salmonellae should always be treated with ATBs
9- incidence of salmonellosis in EU is declining due to an effective vaccine

2041Microbiologic diagnostics of salmonelloses
0+ stool or rectal swabs are suitable for microbiologic diagnostics
1- it is always necessary to collect also blood for haemoculture
2- in extraintestinal salmonellosis if sufficient to collect blood for haemoculture only
3- microscopic examination of stool has a diagnostic role in salmonellosis
4- salmonella is distinguishable in Gram-stain from non-pathogenic intestinal bacteria
5+ diagnostics is based on culture on selective media for intestinal G- rods
6+ salmonellae are identified by biochemical tests and by serotyping
7- antimicrobial susceptibility should always be detected and reported
8+ the suspected sources of infection should also be microbiologically examined
9+ reactive arthritis triggered by salmonella is diagnosed by specific antibody detection

2042Typhoid salmonellae, typhoid and paratyphoid fever
0+ source of infection are infected humans
1+ are transmitted by contaminated food and water
2- persistence of S. Typhi in gall bladder of carriers does not have epidemiological role
3- are transmitted by eggs of infected animals
4- typhoid and paratyphoid fever are caused by salmonellae of the same serotype
5+ typhoid salmonellae regularly invade through the intestinal mucosa to the bloodstream
6- typical presentation of typhoid and paratyphoid fever is diarrhoea
7+ intestinal perforation is a severe complication of advanced stage typhoid fever
8+ therapy is based on fluoroquinolones or 3rd generation cephalosporins
9- relapses of typhoid fever do not occur

2043Microbiologic diagnostics of typhoid fever

0+ blood is collected for haemoculture
1+ typhoid salmonellae are present also in urine, bile and bone-marrow
2+ all samples from physiologically sterile places are examined by microscopy
3- diagnostics of typhoid fever is based only on cultivation of stool
4- typhoid salmonellae are fastidious and need special enriched media
5+ salmonella detection is increased by examination of various type samples
6+ typhoid salmonellae grow on lactose media in lactose-negative colonies
7- there is no need for serotyping after isolation of typhoid salmonellae
8- antimicrobial susceptibility is not tested routinely
9- antibody detection by Widal reaction definitively confirms the typhoid fever

2044Shigella
0- is a non-motile opportunistically pathogenic G- rod
1+ has very low infectious dose and can be transmitted by a direct fecal-oral way
2+ can cause massive intestinal inflammation with destruction of enterocytes
3- can cause watery diarrhoea by production of shiga-toxin
4+ can cause bacillary dysentery and HUS
5- HUS can be caused by all strains of shigellae
6+ rectal swab for diagnostics of shigellosis need rapid transport in transport medium
7+ microbiologic diagnostics is based on cultivation
8- Shigella cannot be serotyped
9- all patients with shigellosis should be treated by antibiotics

2045Yersinia enterocolitica
0+ is transmitted by uncooked meet and meet-products
1+ can be transmitted by raw home-made sausages
2- keeping the food in refrigerator will prevent multiplication of yersiniae
3- is non-invasive and infects large intestine
4- can cause diarrhoea only in children and immunocompromised people
5+ can cause mesenteric lymphadenitis, which resembles appendicitis
6+ can disseminate and cause septic arthritis and osteomyelitis
7- synovial fluid during reactive arthritis contains vital yersiniae
8+ can grow on common media, but needs prolonged cultivation time
9- diarrhoea caused by Yersinia should always be treated by antibiotics

2046Yersinia pestis and plague
0+ Y. pestis is non-sporulating non-motile G- rod
1- Y. pestis is fastidious and cannot grow on blood agar
2+ Y. pestis has protein capsule, inhibiting phagocytosis
3+ plague is endemic disease with natural focuses of infection
4+ can be human-to-human transmitted by respiratory way
5- sylvatic plague is not transmissible to humans
6- bubonic plague is a mild and always self-limited disease
7- pneumonic plague resembles protracted atypical pneumonia
8- post-exposition antibiotic prophylaxis is not necessary
9+ Y. pestis may be misused in the form of biological weapon

2047Vibrio cholerae

0+ V. cholerae is a curved motile rod
1+ causes epidemics and pandemics
2+ water and raw shellfish are sources of V. cholerae
3- in ice cubes it loses vitality
4- colonises large intestine, where it produces toxin
5- all V. cholerae serotypes produce cholera-toxin
6+ can cause profuse watery diarrhoea by activity of cholera-toxin
7+ can be detected by stool culture
8- treatment of cholera is primarily based on antibiotic therapy
9- there is no vaccine against cholera

2048Haemophilus influenzae

0- is a non-motile pleomorphic G+ bacterium
1+ polysaccharidic capsular antigens are protective antigens of H. influenzae
2+ stimulates inflammatory response after release of lipopolysaccharide
3+ is a common agent of respiratory tract infections
4+ can cause pneumonia, meningitis and otitis media in small children
5+ invasive infections are caused first of all by encapsulated strains of the type b
6- grows well on blood agar
7- every isolation of H. influenzae from respiratory mucosa is clinically relevant
8- all strains are well susceptible to penicillin
9- effective vaccine is still not available

2049HACEK-group of bacteria

0+ are component of human oropharyngeal microbiota
1- participate on development of dental caries
2- belong to the important agents of aspiration pneumonia
3+ are agents of subacute endocarditis
4+ may enter to the bloodstream through gingiva damaged by inflammation
5- are non-fastidious and form visible colonies on blood agar within 24 hours
6+ are not always detectable by routine haemoculture
7- diagnosis of HACEK-group-caused infections is based on specific antibody detection
8+ are susceptible to 3rd generation cephalosporins
9+ ampicillin with gentamicin can be applied if the HACEK-agent is beta-lactamase-negative

2050Pseudomonas aeruginosa

0- is facultatively anaerobic non-motile G- rod
1+ proteases, exotoxins, and biofilm are important virulence factors of P. aeruginosa
2+ is an opportunistic pathogen
3+ frequently causes pneumonia in patients with cystic fibrosis
4+ may cause post-antibiotic enterocolitis
5+ may asymptomatically colonise healthy humans
6+ is an important agent of nosocomial infections
7- can cause atypical pneumonia in intubated patients
8- can grow only on complex enriched culture media
9- some strains are susceptible to penicillin and ampicillin

2051Campylobacter spp.

0+ are helical motile microaerophilic G- bacteria
1- have a rather high infectious dose
2- primary source of infection are ill humans or carriers
3+ are transmitted by contaminated water and food
4+ are invasive and cause inflammatory type of diarrhoea
5+ thermophilic campylobacters are spread by birds
6- are resistant to desiccation and to oxygen exposition
7- grow well on selective lactose media for intestinal G- rods
8- are not able to cause extraintestinal infections
9+ may trigger reactive arthritis and Reiter syndrome

2052Campylobacter spp. and campylobacteriosis

0+ are zoonotic agents
1+ are transmitted alimentary or by direct contact with colonised animals
2- interhuman transport was not observed
3- campylobacter diarrhoea starts in 5-12 hours of eating contaminated food
4+ can spread from intestine to blood, resulting in sepsis
5+ can trigger post-infectious Guillain-Barré syndrome
6- cause only watery diarrhoea without fever or blood in stool
7+ therapy of choice are macrolides, tetracyclines and ciprofloxacin
8- antibiotics must be applied to all infected people
9- attenuated vaccine is available for children

2053Diagnostics of campylobacterioses

0+ stool must be transported within 2 hours and immediately processed
1+ rectal swab must be transported in transport medium
2- microscopic examination of stool sample has diagnostic role
3+ campylobacters in preparation resembles flock of flying birds
4- campylobacter antigen detection in stool is not performed routinely
5+ campylobacters are included in multiplex PCR-panels for gastroenteritis
6- campylobacters are cultivated for 24 hours on blood agar at 37 °C
7+ campylobacters can be reliably identified to the species level by MALDI-TOF MS
8- antimicrobial susceptibility of campylobacters is not tested routinely
9- campylobacter diarrhoea is diagnosed by specific antibody detection in serum

2054Helicobacter pylori and H. heilmannii

0+ belong to the gastric helicobacters
1+ are microaerophilic with temperature optimum of 37 °C
2- are transmitted alimentary
3- cause zoonoses
4- grow well in anaerobic conditions
5+ form coccoid dormant forms
6- H. heilmannii grows well on culture media
7- both species can initiate carcinogenesis
8+ H. heilmannii causes only mild gastritis

9+ ammonium and vacuolising toxin of H. pylori damage the gastric mucosa

2055Helicobacter pylori

0+ is human-to-human transmitted by oro-oral or fecal-oral way
1+ motility, urease and adhesins participate on stomach mucosa colonisation
2- is living and multiplying in the content of stomach
3+ can colonise cardia, corpus and antrum of stomach
4- vacuolising toxin is produced by all H. pylori strains
5+ cagA-gene products of Helicobacter pylori participate on the pathogenesis of gastritis
6- infection caused by H. pylori is always symptomatic
7+ H. pylori can induce autoantibody production during chronic gastritis
8- cannot cause duodenal ulcer
9+ H. pylori can induce gastric ulcer or carcinoma during chronic gastritis

2056Diagnostics and therapy of helicobacter-caused gastritis

0+ urease breath test has both high specificity and sensitivity
1- helicobacter antigen detection in stool definitely confirms infection
2+ biopsy of gastric mucosa is sampled for microscopy and culture diagnostic
3- molecular methods are not reliable in the diagnostics of helicobacter gastritis
4- antimicrobial susceptibility is not tested
5- antibody detection by ELISA is used to monitor the helicobacter infection therapy
6+ antibody detection is helpful only in epidemiological, population-based studies
7- therapy of helicobacter-caused gastritis is based on monotherapy by rifampicin
8+ treatment is based on combination of several antibiotics with proton-pump inhibitor
9+ helicobacters are susceptible to amoxicillin, clarithromycin and metronidazole

2057Bordetella pertussis

0+ is a small, strictly aerobic G- fastidious coccobacillus
1+ is susceptible to desiccation
2- the most frequent infectious source are infected animals
3+ it has affinity to respiratory mucocilliary epithelium
4- multiplies intracellularly in the human body
5- B. pertussis destroys phagocytes by tracheal cytotoxin
6+ tracheal cytotoxin damages mucociliary epithelium
7- filamentous haemagglutinin sterically blocks phagocytosis
8+ pertussis toxin alterates immune response
9- Bordetella is protected from phagocytosis by thick capsule

2058Bordetella pertussis and diseases that it can cause

0+ is transmitted by respiratory way after a close contact with infected person
1- it causes necrotising inflammation of larynx
2- pertussis toxin acts only locally at the site of infection
3- whooping cough is clinically detectable already in its catarrhal stage
4+ paroxysmal stage of pertussis develops after mucociliary transport is damaged
5+ serious complication of pertussis is a secondary bacterial pneumonia
6+ chronic persistent cough may be the only symptom in partially immune persons
7+ antibodies against adhesins and toxins of bordetellae have protective effect

8- bordetellae are inactivated by cytotoxic T-lymphocytes
9- postinfectious immunity is life-long

2059Bordetella pertussis – diagnostics, therapy and prevention
0+ suitable are samples from respiratory tract; they must be protected from desiccation
1+ samples are cultivated on special media at least for 7 days
2- microscopic examination provides a rapid preliminary confirmation of pertussis
3- PCR is not suitable for pertussis laboratory diagnostics
4- pertractin detection in urine definitively confirms the diagnosis of pertussis
5+ detection of antibody against pertussis toxin is used in microbiologic diagnostics
6+ pertussis is treated by macrolides; penicillins and cephalosporins are not effective
7- antibiotics applied in paroxysmal stage of pertussis relieve cough paroxysms
8+ children are vaccinated against pertussis by acellular subunit vaccine
9+ vaccination has time-limited protective effect

2060Legionellae
0+ are G- aerobic aquatic bacteria, which primarily infect free-living amoebae
1+ during their life cycle may alternate several phenotypic forms
2- the most important virulence factors of legionellae are capsules and leukocidin
3+ contaminate water tubing and air-conditioning systems
4- are rapidly inactivated in wet soil and compost
5+ are agents of sapronoses
6- are transmitted by alimentary way by contaminated water and food
7- can be transmitted from human-to-human
8+ can cause nosocomial infections
9- form biofilms on catheters and implants

2061Legionellae (L.) and legionelloses
0+ L. enter to the body by inhalation of contaminated water aerosol
1+ L. infect alveolar macrophages and alveolar epithelial cells
2- in the human body L. multiply extracellularly
3+ L. usually cause asymptomatic infection in immunocompetent people
4+ legionnaires disease is atypical pneumonia with systemic symptoms
5- Pontiac fever is a severe systemic disease of immunosuppressed people
6- antibodies do not play any role in the immune reactions against legionellae
7+ IFN-gamma and cell-mediated immunity have protective role against L.
8- Th-2 cytokine response protects from L.
9+ L. are destructed by activated macrophages

2062Diagnostics, therapy and prevention of legionelloses
0- in the acute phase of legionnaires disease, sputum caught up by the patient is collected
1- blood for haemoculture is routinely collected
2+ routine diagnostics of legionelloses is based on bacterial antigen detection in urine
3+ legionellae require cysteine and iron salts for their growth on culture media
4- legionellae form small colonies on blood agar after prolonged cultivation
5- PCR can detect only L. pneumophila serogroup I
6+ antimicrobial susceptibility of legionellae is not tested routinely

7+ legionnaires disease is treated by macrolides, fluoroquinolones or tetracyclines
8- Pontiac fever must be treated by aminopenicillins or cephalosporins
9- preventive vaccination against legionellae is available for risk-group people

2063Bartonellae
0- are small motile G+ coccobacilli
1- have anaerobic metabolism
2+ enter to the body by damaged skin
3+ can be transmitted by arthropods
4+ infect erythrocytes and vascular epithelium
5- cause diseases only in children and immunocompromised people
6+ cause recurrent fever and angiomatosis
7+ on culture media they grove extremely slowly
8- on blood agar they do not grow at all
9- in the human body they are well susceptible to penicillin

2064Bartonella bacilliformis (BB) and diseases which are caused by this bacterium
0+ BB do not occur naturally in the EU
1- BB is transmitted by respiratory way
2+ humans are the sources of infection
3- infection by BB have clinical presentation only in immunocompromised people
4+ BB causes Carrion disease
5+ during infection BB causes anaemia and transient immunosuppression
6+ infection has biphasic course and may be fatal
7- microscopic diagnostics of Oroya fever is highly susceptible
8- antibiotic therapy is usually not necessary
9+ BB is susceptible to fluoroquinolones and chloramphenicol

2065Bartonella quintana and diseases which are caused by this bacterium
0- is endemic in the Danube River Basin
1- small rodents are source of infection
2- is transmitted by mosquitoes
3+ can long-lastingly persist in the bloodstream
4- in human body it multiplies extracellularly
5- is transmitted during construction works
6+ is the agent of trench fever
7+ can cause bacillar angiomatosis and subacute endocarditis
8+ haemoculture may help in diagnostics
9+ treatment is based on macrolides or tetracyclines

2066Bartonella henselae
0+ is transmitted by cat scratch
1- interhuman transmission by lice is not excluded
2+ invades through skin and causes chronic regional lymphadenopathy
3- causes neonatal meningitis after perinatal transmission
4- causes severe systemic infections in children
5- causes professional bacillary peliosis

6+ is the agent of subacute endocarditis
7- routine diagnostics is based on cultivation on chocolate agar
8+ antibiotic treatment is usually not necessary
9+ disseminated infections are treated by macrolides or tetracyclines

2067Brucellae
0+ are small G- coccobacilli
1+ are very fastidious and multiply very slowly
2- cannot produce their own ATP
3- cannot be stained by Gram staining
4- bats and small rodents are the main reservoir of brucellae
5+ cause zoonoses
6- are transmitted by arthropod vectors
7+ infect macrophages, in which they intracellularly multiply
8- cause acute pyogenic infections
9+ can persist in infectious focuses and cause relapses of brucellosis

2068Brucella spp. and brucellosis
0+ enter to the body through damaged skin, conjunctival mucosa, respiratory tract or GIT
1- alimentary transmission is very rare
2+ cause flu-like symptoms, in chronic stage undulant fever
3+ cause granulomatous inflammation
4+ microbiologic diagnostics is based on the agent detection by cultivation
5- haemoculture is not suitable for diagnostics - brucellae are never present in blood
6- specific antibody detection does not have diagnostic role
7- untreated human brucellosis has always very high lethality
8+ therapy is based on prolonged application of doxycycline with rifampicin
9+ vaccination of reservoir domestic animals is used in the primary prevention

2069Francisella tularensis
0+ is a pleomorphic G- non-motile non-sporulating coccobacillus
1- gains energy from fermentation of sugars
2- in the external environment it is rapidly inactivated
3- is susceptible to low temperatures - it is inactivated by freezing
4+ is a zoonotic pathogen
5+ can be transmitted by ectoparasites, first of all by ticks
6+ multiplies intracellularly
7+ the capsule protects extracellular francisellae from lysis by complement
8- cannot cause chronic infections
9- Francisella does not occur in Europe

2070Francisella tularensis (FT) and tularemia I
0+ FT is endemic throughout the Northern Hemisphere
1+ tularemia is a natural-focal disease
2+ FT has very low infectious dose
3+ FT can be transmitted by direct contact
4- interhuman transmission of FT is quite frequent

5+ FT can be transmitted by consumption of contaminated water and food
6- FT causes pyogenic infections
7+ FT can persist in infectious focus and causes relapses of disease
8- FT is producing biofilm on infected mucosae
9- specific antibody does not have any role in francisella inactivation in the body

2071Francisella tularensis (FT) and tularemia II
0- FT cannot be transmitted by respiratory way
1+ FT enters to the body through damaged skin and intact conjunctiva
2+ humans are most frequently infected by FT from rabbits and hares
3+ FT can cause professional infections of hunters and foresters
4- FT causes infections with clinical presentation only in immunocompromised people
5+ key role in defence against FT have IFN-gamma, TNF and macrophages
6+ FT may disseminate in the body of patients with insufficient cell-mediated immunity
7- FT is not able to infect CNS
8- people with defective IgA production have fulminant outcome of tularemia
9+ FT is a potential biological weapon

2072Diagnostics, therapy and prevention of tularemia
0+ tularemia is microbiologically diagnosed by haemoculture
1+ francisella is fastidious, requires cysteine and grows slowly
2- francisella grows on blood agar after prolonged cultivation
3+ PCR rapidly and definitely confirms the clinical diagnosis of tularemia
4- antimicrobial susceptibility of francisella is detected by disk diffusion test
5+ specific antibody detection belongs to the basic diagnostical options of tularemia
6+ therapy of tularemia is based on streptomycin application
7- the less severe forms of tularemia can be treated by penicillins and cephalosporins
8+ tularemia can be treated by gentamicin, tetracyclines and ciprofloxacin
9- patients with tularemia must be preventively isolated

2073Pasteurella multocida (PM)
0+ is a small encapsulated G- coccobacillus
1- natural reservoir of PM are ectoparasites of rodents
2+ can colonise oral cavity of dogs and cats (colonisation is symptomless)
3+ most frequently is transmitted by animal bite (infects the bite-wound)
4- can survive long-lastingly in the environment
5- important virulence factor of PM is biofilm production
6- causes pneumonia of farmers
7+ causes cellulitis and lymphadenopathy in humans
8+ diagnostics of pasteurellosis is based on cultivation
9- all strains of PM are susceptible to penicillin

2074Clostridium tetani and tetanus
0+ C. tetani can colonise the intestinal tract of humans and animals
1+ virulence of C. tetani is based on tetanospasmin production
2+ tetanospasmin interferes with function of inhibitory synapses
3- tetanic spasms are caused by tetanolysin

4- diagnostics of tetanus is based on toxin detection in serum of patient
5+ antibodies against tetanic toxin cross the placenta
6+ tetanus is confirmed by C. tetani culture from the wound of patient
7- antibiotics are the primary treatment of patient with symptoms of tetanus
8- antitoxin is applied to patient only after microbiologic confirmation of tetanus
9- tetanic antitoxin inactivates also the toxin already bound to the neurons

2075After tetanic antiserum application to the patient
0- patient is protected against tetanus during the next 15 years
1+ the free tetanospasmin is in the patient's body inactivated
2- patient starts to produce own antibodies against tetanic toxin
3- the complement level in blood is increasing
4- the serum bactericidal activity against C. tetani is increasing
5+ tetanolysin remains active
6- the immune adherence of clostridia is increasing
7+ the protective activity of the applied antibody is short-lasting
8- the protective effect of antiserum can be substituted by high dose antibiotics
9+ except to antiserum, complex therapy of the patient is inevitable

2076Botulinum toxin producing clostridia and botulism
0- spores of botulinum toxin producing clostridia are inactivated by boiling
1- acidic pH supports germination of botulinum toxin producing clostridia
2+ botulinum toxins block liberation of acetylcholine at the neuro-muscular plate
3- botulinum toxins are thermostable
4- clostridia during wound botulism are invading to the tissues
5+ feeding of infants by honey may lead to infant botulism
6+ if botulism is suspected, antiserum must be applied as soon as possible
7+ removal of botulinum toxin from GIT prevents its further absorption to the blood
8- there is no need for antibiotic treatment of infant botulism
9+ botulinum toxins are detected in food remnants, content of GIT and in the serum

2077Spirochaetes
0+ are thin spiral G- bacteria
1- are resistant to desiccation and other environmental factors
2+ move by aid of periplasmic axial filaments
3+ can be observed by dark-field microscopy
4+ are susceptible to beta-lactam antibiotics and tetracyclines
5- no one of the spirochaete species is part of healthy humans microbiota
6- all spirochaetes are opportunistic pathogens of humans
7+ some colonise subgingival dental plaque and sulcus gingivalis
8+ to spirochaetes belong genera Treponema, Leptospira and Borrelia
9- to spirochaetes belong genera Spirillum, Helicobacter and Borreliella

2078Treponema pallidum (TP) and syphilis
0- TP is exclusively transmitted by sexual way
1- infectious is only the first stage of syphilis
2+ TP can cause both intrauterine and perinatal infection

3- ulcus molle is a typical lesion of primary stage of syphilis
4- gummata are formed in tissue already during the secondary stage of syphilis
5- skin and mucosal lesions are typical for the early and late latent syphilis
6+ tertiary syphilis is typical with damage to the CNS and cardiovascular system
7+ treatment of syphilis is based of penicillin
8+ prevention is based on regular screening of blood donors and pregnant women
9+ all sexual partners of the patient with syphilis must be examined and treated

2079Laboratory diagnostics of syphilis is based on
0- routine examination of sample by dark-field microscopy
1+ detection of the agent in tissue sections by immunofluorescence
2- culture on special enriched culture media for treponemae
3- antibody detection to differentiate syphilis from non-veneral treponematoses
4+ detection of reagin antibodies to monitor the syphilis activity and treatment results
5+ detection of anti-treponemal antibodies in congenital syphilis
6+ combination of reagin and anti-treponemal antibodies (routinely)
7+ Western-blot to exclude the non-specific reactivity of examined serum
8+ PCR in congenital syphilis
9- confirmation of PCR by anti-cardiolipin antibody detection

2080Laboratory diagnostics of syphilis – mark the correct options
0+ serum for antibody detection
1- swab from the chancre surface for microscopy
2- pus from gummatous lesions for cultivation
3+ liquor, material from skin and mucosal lesions for PRC in neonates
4+ Western blot for confirmation of results in newly-diagnosed patients
5+ RRR for detection of reagin antibodies
6- TPHA test for detection of anti-cardiolipin antibodies
7- cardiolipin for confirmation of antibody detection assays
8+ FTA-abs test for anti-treponemal antibody detection
9- BWR for detection of treponemal antigens in liquor

2081Borreliella burgdorferi and the Lyme borreliosis
0- source of infection are humans
1+ it is transmitted by ticks
2- to the body enters in 3 hours after a tick-bite
3- it can be transmitted both transplacentally and perinatally
4- it can survive for a long time in infectious dust
5- way of entry is the conjunctiva and the respiratory mucosa
6+ it can asymptomatically persist in the body and causes relapses
7+ treatment is based on tetracyclines, aminopenicillins and cephalosporins
8- patient with erythema migrans should not be treated with antibiotics
9+ Lyme borreliosis can be caused also by other borreliae than B. burgdorferi

2082To the main clinical presentations of the Lyme borreliosis belong
0+ skin manifestations
1- lung involvements

2+ neurologic symptoms
3+ heart disturbances
4- sepsis
5+ musculoskeletal symptoms
6- liver involvements
7- gastrointestinal problems
8+ ocular manifestations
9- kidney and urinary bladder damage

2083Laboratory diagnostics of Lyme borreliosis is based on
0- detection of cell-mediated immunity by skin test
1+ specific antibody detection
2+ antibody detection in liquor during neuroborreliosis
3- borrelial antigen detection in liquor during meningitis
4+ immunoblot for confirmation of ELISA-reactive sera
5- microscopic examination of liquor after Gram-staining
6- 48-hours cultivation on chocolate agar
7+ PCR during acute neuroborreliosis (liquor) and arthritis (synovial fluid)
8- PCR during borreliosis of eye (conjunctival swab)
9+ isolation of borreliae from erythema migrans biopsy or liquor during acute stage

2084Borrelia recurrentis
0+ is a motile spiral bacterium
1+ source of infection are humans
2+ causes epidemic louse-borne disease
3- if there are no lice available, it can spread by ticks as well
4- causes fever with sepsis and septic meningitis
5+ borrelia antigen variations results in relapsing fever
6+ can be detected by microscopy of blood sample
7- blood for haemoculture is collected for diagnostics
8- it is resistant to beta-lactam drugs
9- thanks to regular vaccination it was eradicated

2085Borreliae can cause
0+ epidemic relapsing fever
1- Haverhill fever
2+ endemic relapsing fever
3- Malta fever
4- Q-fever
5+ tick-borne relapsing fever
6- trench fever
7- Pontiac fever
8+ louse-borne relapsing fever
9- harvest fever

2086Leptospirae
0+ belong to spiral bacteria

1+ have several serotypes
2- are strictly anaerobic
3+ are primarily zoopathogenic
4- are opportunistic pathogens of humans
5+ are excreted by urine of infected animals
6+ are transmitted by water and food contaminated by urine of infected animals
7- can cause alimentary infections and food intoxications
8- rapidly are inactivated in wet soil
9- on blood agar form visible colonies after 48-hours cultivation

2087Leptospirae
0+ humans are most frequently infected by contaminated water
1+ leptospirae invade through mucosae and skin breaks
2- leptospirae are transmitted by arthropods
3- they do not cause professional infections
4- after invasion through skin they cause localised pyogenic infection
5+ leptospirosis has most frequently flu-like symptoms
6+ they damage capillary endothelium and cause vasculitis
7+ they damage first of all liver, CNS and kidney
8- protective immunity is mediated by cytotoxic T-lymphocytes
9- leptospiral antiserum is routinely used in the treatment

2088Leptospirosis - diagnostics
0+ leptospirae can be found in blood and liquor; later also in urine
1- midstream urine is collected for bacteriuria quantification
2- leptospirae can be isolated from stool of the infected patient
3- blood is sampled to haemoculture bottles
4- leptospirae are growing on chocolate agar after a prolonged cultivation
5+ leptospirae are serotyped by microagglutination-lytic reaction
6+ blood is sampled for specific antibody detection
7+ serotype-specific antibody response is detected
8- IGRA-test is performed
9+ antimicrobial susceptibility of leptospirae is routinely not tested

2089Mycoplasmae and ureaplasmae
0+ cannot form peptidoglycan
1+ cannot be stained by Gram-stain
2+ are pleomorphic and pass through bacteriologic filters
3+ are resistant against antibiotics inhibiting the cell wall synthesis
4- have a firm cell wall
5+ have a three-layered cell membrane with cholesterol
6- cannot produce their own ATP
7- cannot grow on laboratory culture media
8- are strictly intracellular
9- have anaerobic metabolism

2090Mycoplasma pneumoniae and infections that it causes

0+ is transmitted by respiratory droplets
1- long-lastingly survives in infectious dust
2+ damages the respiratory mucociliary epithelium
3+ causes respiratory tract infections and primary atypical pneumonia
4- purulent inflammation is typical for mycoplasma diseases
5+ during infection it may trigger cold agglutinins production
6- diagnostics is based on culture, rather than on specific antibody detection
7+ produces microcolonies on special media after prolonged cultivation
8- specific IgG in single sample of serum confirms the diagnosis of pneumonia
9- penicillins and cephalosporins are effective in the therapy

2091Urogenital mycoplasmae and diseases that they cause
0+ to them belong M. hominis, M. genitalium and Ureaplasma urealyticum
1- to them belong M. penetrans, M. genitalium and M. faucium
2+ can colonise vaginal mucosa and distal urethra of healthy humans
3+ after overmultiplication can cause non-gonococcal urethritis and cervicitis
4+ can be detected in urethral, vaginal or cervical swab, sperm or first stream of urine
5- samples containing mycoplasmae must be transported anaerobically
6+ laboratory diagnostics is based on 2-days metabolic tests
7- their antimicrobial susceptibility is routinely not detected
8- produce beta-lactamases
9- are susceptible to vancomycin

2092Rickettsiae
0+ contain peptidoglycan, but are poorly stained by Gram-stain
1+ contain lipopolysaccharide
2- do not synthesise their own ATP
3- do not have their own proteosynthesis
4+ are obligatory intracellular
5- are protected from phagocytosis by capsules
6+ infect macrophages and endothelial cells
7+ are destroyed by activated macrophages, cooperating with antibodies
8- are not able to persist long-lastingly in the body
9- are not susceptible to antibiotics

2093Rickettsiae and rickettsioses
0+ are transmitter by arthropod vectors
1- are endemic
2- mostly case only asymptomatic infections
3- usually do not cause skin rash
4+ the infected patient may die after multi-organ failure
5+ diagnostics is based on specific antibody detection
6+ PCR can be used in diagnostics
7+ tetracycline or chloramphenicol are used in therapy
8- children and pregnant women are treated by penicillin with gentamicin
9- vaccination is recommended for travellers

2094Coxiella burnetii and diseases it can cause

0- source of infection are humans
1+ is transmitted by inhalation, by alimentary way, contact or tick-bite
2+ is the agent of Q-fever
3- is the agent of nosocomial infections
4- frequently causes infections with exanthema and enanthema
5+ causes atypical pneumonia and hepatitis
6+ can cause chronic infection with endocarditis
7- does not cause persistent latent infections with reactivations
8+ laboratory diagnostics is based on specific antibody detection and PCR
9- treatment is based on beta-lactam antibiotics and vancomycin

2095Ehrlichia, Anaplasma and diseases caused by them

0+ circulate among animal hosts in natural focuses
1- are commonly transmitted from human to human
2+ infect leukocytes
3+ form morulae in infected cells
4- in the body they multiply extracellularly
5- produce enterotoxins
6+ in immunocompetent humans usually cause fever and flu-like symptoms
7+ are transmitted to humans by tick bite
8- skin rash is absent during infection
9- ehrlichioses and anaplasmoses have rather high lethality

2096Microbiologic diagnostics and therapy of ehrlichioses and anaplasmoses

0+ peripheral blood is sampled for microscopic examination
1+ blood smear is examined microscopically for morulae detection
2- morulae are detectable in the blood of patient until the end of convalescence
3- negative blood smear excludes the infection
4- diagnostics is based on prolonged cultivation on blood agar
5+ in unclear cases bacterial genome analysis can be performed
6- specific antibody detection does not have diagnostic role
7+ microbiologic examination of attached tick has supplementary role
8+ therapy of choice are tetracyclines
9- in allergy to tetracyclines, macrolides and fluoroquinolones are recommended

2097Chlamydiae

0+ are small, strictly intracellular bacteria
1- do not have lipopolysaccharide
2- in Gram stain are Gram-positive
3+ elementary body is their infectious form
4+ elementary body does not contain peptidoglycan
5+ form inclusion in infected cells
6- multiply freely within the cytoplasm of the infected cell
7+ cannot produce their own ATP (are energetic parasites)
8- cannot persist in infected macrophages for longer time
9- reticulate bodies are released from infected cell at the end of replication

2098Chlamydia trachomatis serotypes D-K

0+ occur worldwide
1- are transmitted by sexual way only
2- are agents of trachoma
3+ cause genital infections, conjunctivitis and proctitis
4+ may cause infection leading to infertility
5- can cause purulent neonatal meningitis
6+ persistent forms can reactivate and cause relapses
7- beta-lactam antibiotics are the first choice of therapy
8+ are susceptible to macrolides, tetracyclines or fluoroquinolones
9- prevention is based on vaccination

2099Chlamydia pneumoniae (CP) and diseases caused by this species

0- infectious source are birds
1+ CP is transmitted by respiratory droplets
2+ CP more frequently infects upper respiratory tract than lungs
3- CP is a common agent of secondary bacterial post-influenza pneumonia
4+ CP is suspected to contribute to the pathogenesis of atherosclerosis
5- CP can be detected by culture on blood agar (it forms colonies after 2 days)
6+ diagnostics of CP infections is based on specific antibody detection
7- PCR is not suitable for diagnostics of chlamydial pneumonia
8+ therapy is based on application of macrolides or tetracyclines
9- chlamydial pneumonia of children is preferentially treated by fluoroquinolones

2100Diagnostics of chlamydial infections is based on

0- detection of chlamydial capsular antigens in urine (during pneumonia and urethritis)
1+ detection of chlamydial DNA/RNA in the first urine portion (during urethritis)
2- detection of chlamydial DNA/RNA in the first urine portion (during cervicitis)
3+ detection of chlamydial DNA/RNA in aspirate or biopsy (during adnexitis)
4- specific antibody detection in serum during urogenital chlamydial infections
5+ specific antibody detection in serum during chlamydial pneumonia
6- sputum culture during chlamydial pneumonia
7+ specific antibody detection during reactive arthritis
8- microscopic detection of chlamydiae in inflammatory exudates (Gram stain)
9+ immunofluorescent detection of chlamydiae in cervical swab (Dacron or cytobrush)

Virology

3001Viruses differ from the other microorganisms by

0- viruses contain both RNA and DNA
1+ viruses are obligatory intracellular
2+ viruses do not multiply by binary fission of the mother cell
3+ viruses do not have their own metabolism
4- viruses have only anaerobic metabolism
5- viruses are susceptible to some of the broad-spectrum antibiotics
6- viruses can grow only on special synthetic culture media
7+ viral genome contains genes for both structural and non-structural viral proteins

8+ viruses are dependent on the host cell in the production of energy and proteins
9- not all viruses are able to form their virion structures by self-assembly

3002Perzistent non-productive infection is typically caused by
0+ varicella-zoster virus
1+ Epstein-Barr virus
2+ human papillomaviruses
3+ HTLV-1
4- rhinoviruses
5- influenzaviruses
6- norovirus
7- hepatitis-A virus
8+ HHV-6
9- hepatitis-E virus

3003To oncogenic viruses belong
0+ HTLV-1
1- tick-borne encephalitis virus
2- poxvirus
3+ hepatitis-B virus
4- polioviruses
5+ Epstein-Barr virus
6- hepatitis-A virus
7- morbillivirus
8+ human papillomavirus HPV-16
9+ hepatitis-C virus

3004To the antiviral drugs against influenzavirus belong
0+ amantadine
1+ zanamivir
2+ rimantadine
3- acyclovir
4- valganciclovir
5- lamivudine
6- efavirenz
7+ oseltamivir
8- vidarabine
9- raltegravir

30054Mark the viruses that can cause exanthematous disease
0+ HSV
1- JC virus
2+ VZV
3- rotavirus
4- poliovirus
5- HEV

6- RSV
7+ coxsackie virus A
8+ erythrovirus (parvovirus B19)
9+ morbillivirus

3006Poxviruses are able to cause
0+ cowpox
1+ smallpox
2- measles (morbilli)
3- varicella
4+ molluscum contagiosum
5+ milker's nodule (paravaccinia)
6- rubella
7- herpes zoster
8- subacute sclerotising panencephalitis
9+ tanapox

3007Herpesviruses
0+ some of them have oncogenic potential
1+ can be transmitted by sexual contact
2+ agent of varicella belongs to them
3- agent of variola belongs to them
4+ agent of infectious mononucleosis belongs to them
5+ may long-lastingly persist latently in the human body
6- humoral immunity plays crucial role in infections caused by all of herpetic viruses
7- shingles (herpes zoster) arise during reinfection by varicella-zoster virus
8- all herpetic viruses are primarily neurotropic
9- can cause disease only in people with immunodeficiency

3008Herpes simplex virus may cause
0+ generalised neonatal infection
1- Q-fever
2- purulent meningitis
3+ aseptic meningitis
4+ meningoencephalitis
5- zoster
6- infectious mononucleosis
7+ recurrent genital infections
8- infectious warts
9+ keratitis and keratoconjunctivitis

3009Primary herpetic infection may have the following clinical presentation
0- recidiving herpes labialis
1+ gingivostomatitis
2+ keratoconjunctivitis
3- recidiving keratitis

4+ vesicular skin efflorescence
5+ efflorescence on the mucosa of external genitals
6- herpes zoster
7- smallpox
8- bullous impetigo
9- toxic epidermolysis

3010Epstein- Barr virus
0- is primary neurotropic
1- infects predominantly T-lymphocytes
2+ is the agent of infectious mononucleosis
3- during infection stimulate life-long immunity
4+ can be isolated from B-lymphocytes
5+ participates on development of nasopharyngeal carcinoma
6- does not take part in activation of autoimmune diseases
7+ during infection stimulate production of heterophilic antibodies
8- during infection does not stimulate any antibody response
9+ can cause glandular fever

3011Epstein-Barr virus
0+ is transmitted by saliva
1- is the agent of herpes genitalis
2- replicates exclusively in T-helper lymphocytes
3+ is oncogenic
4- cannot be transmitted by blood
5+ sera of patients with EBV infection have positive reaction in Paul-Bunnell test
6+ infection by EBV can stimulate production of various autoantibodies
7+ virus has affinity to B-lymphocytes (can cause their oncogenic transformation)
8+ can cause hepatitis
9- cannot cause long-lasting latent infection

3012Cytomegalovirus
0+ has considerable teratogenic effect
1+ can cause infectious mononucleosis-like disease
2+ after recovery from the primary infection it can persist latently in the body of the host
3+ is lymphotropic
4+ in patients with defects of immunity can cause hepatitis
5+ in patients with defects of immunity can cause infection of CNS
6- in patients with defects of immunity can cause herpes zoster
7- in immunocompetent persons can cause acute diarrhoea
8- is resistant to the common disinfectant agents
9- in children can cause exanthematous disease

3013The agent of influenza is
0+ orthomyxovirus

1+ RNA virus
2+ enveloped virus
3+ virus with segmented genome
4- *Haemophilus influenzae*
5- virus with icosahedral symmetry
6+ virus with helical symmetry of capsid
7+ virus with H and N envelope antigens
8- DNA virus
9- transmissible also by fecal-oral way

3014For repeated pandemics of influenza are responsible
0+ changes of influenza virus surface antigens
1+ antigenic shift in influenza virus A
2- antigenic drift
3+ reassortment between human and animal influenza viruses
4- high resistance of the influenza virus to external factors
5- weak immunogenicity of influenza viruses
6- antigenic shift in influenza virus type B
7- modification of lipidic bilayer of the influenza virus envelope
8+ exchange of genome segments
9+ high variability of influenza virus and unavailability of universal vaccine

3015To the enteroviruses belong
0+ polioviruses
1+ coxsackie viruses
2+ ECHO-viruses
3- hepatitis-A virus
4+ some agents of exanthematous diseases
5- rabies virus
6- rotaviruses
7- adenoviruses
8- HIV
9- astroviruses

3016For polioviruses is typical, that
0+ they enter to the body through gastrointestinal tract
1+ they multiply in lymphatic cells of gastrointestinal tract
2+ can multiply in oropharyngeal lymphatic tissue
3- in the CNS they infect only neurons in spinal cord
4- incubation period is more than 50 days
5- they produce neurotoxic proteins
6- infection, that they cause, does not stimulate immunity
7+ enter to the CNS by haematogenous way
8- are arthropod-borne
9- their target receptor is the CD4 antigen

3017Prevention against poliomyelitis is performed by

0+ parenterally applied inactivated virus in vaccine
1- perorally applied inactivated virus in vaccine
2+ regular vaccination of children
3- specific immunoglobulin
4- subunit vaccine
5- anatoxin
6- chemoprophylaxis before travel to endemic countries
7+ vaccination by poliovirus of the serotypes 1, 2 and 3
8- vaccination of pregnant women before travel to endemic countries
9+ initial vaccination in the 1st year of age and boosters in 5th and 12th year of age

3018Coxsackieviruses can cause
0+ aseptic meningitis
1+ exanthematous disease
2+ herpangina
3+ infections of upper airways
4+ myocarditis
5- panencephalitis
6- diarrhoea with severe dehydration
7+ generalised infections of various organs
8+ reversible paralysis
9- parotitis

3019Rhinoviruses cause
0- influenza
1+ rhinitis
2- pneumonia
3- diarrhoea
4- exanthematous skin diseases
5- tonsillitis
6+ infections of mucosae with physiologically lower temperature (27-32 °C)
7- disease transmissible by sexual contact
8+ infection transmissible by fomites
9+ at least half of all viral cases of common cold

3020Rotaviruses cause
0+ the majority of all viral diarrhoea in children
1+ acute gastroenteritis
2- dysentery
3- neuroinfection
4+ nosocomial infections of neonates
5- postantibiotic enterocolitis
6- toxin-mediated diarrhoea
7+ damage in the function of enterocytes
8- generalised infection with viremia
9+ inapparent infections of adults

3021Hepatitis-A virus
0+ belongs to the Picornaviridae family
1- belongs to the Enterovirus genus
2+ is excreted by stool
3+ is transmitted by fecal-oral way
4- can cause infection of upper airways
5- can cause chronic hepatitis
6+ is the agent of disease that is preventable by vaccination
7+ gamma-globulin may be applied post-expositionaly
8- infection caused by HAV do not stimulate post-infectious immunity
9- occurs only in tropic and subtropic countries

3022Hepatitis-B virus
0- is a non-enveloped RNA virus
1+ is transmitted parenterally
2+ is uses reverse transcriptase during replication
3+ is sexually transmitted
4+ can be transmitted transplacentally and perinatally
5- does not cause acute form of hepatitis
6- cross-reacts with hepatitis-A virus
7+ antibodies against surface antigen (anti-HBsAg) are protective
8- is transmitted by contaminated water
9+ has oncogenic potential

3023Parainfluenzaviruses cause
0+ infection of upper airways
1+ bronchitis
2+ bronchopneumonia
3+ pseudocroup (oedema of laryngeal mucosa)
4- life-long immunity after recovery from disease
5- diarrhoea
6- salivary glands infection
7- exanthematous diseases of children
8- meningoencephalitis
9- hepatitis

3024Agent of the viral parotitis is
0+ paramyxovirus
1- orthomyxovirus
2+ RNA virus
3- parvovirus
4+ virus with helical symmetry of capsid
5- virus with icosahedral symmetry of capsid
6- poxvirus
7+ gonadotropic virus
8- virus, which does not cause production of syncytia
9+ virus transmissible by respiratory droplets

3025Parotitis virus can affect
0+ salivary glands
1+ testes
2+ pancreas
3+ meninges
4- pulmonary parenchyma
5- liver
6- function of enterocytes
7+ spermatogenesis (in adults, due to pressure necrosis during orchitis)
8- adrenals
9- middle ear

3026Morbillivirus
0+ causes exanthematous childhood disease
1- multiplies in epidermal cells
2+ causes typical enanthem on buccal mucosa
3+ multiplies in conjunctival epithelia
4- is the agent of varicella
5+ infection caused by this virus may be complicated by pneumonia or encephalitis
6+ can cause subacute sclerosing panencephalitis (SSPE)
7- can cause chronic diarrhoea
8- can cause disease only in childhood
9- has been worldwide eradicated due to regular vaccination

3027Morbillivirus belongs to
0+ paramyxoviruses
1- poxviruses
2- reoviruses
3- togaviruses
4- viruses with icosahedral symmetry of capsid
5- herpetic viruses
6+ viruses transmissible by respiratory droplets
7+ viruses containing haemagglutinin in envelope
8- viruses containing neuraminidase in envelope
9+ agents of postinfectious encephalitis

3028Respiratory syncytial virus
0+ can cause bronchiolitis in small children
1+ can cause interstitial pneumonia in immunosuppressed
2+ in adults usually causes infection of upper airways
3- in immunocompromised adults can cause severe hepatitis
4+ during wither usually causes epidemics
5- can cause aseptic meningitis
6- can cause exanthematous disease
7- is the agent of viral diarrhoea
8+ is the agent of nosocomial infections of infants

9- active immunisation is available for neonates

3029Rhabdoviruses
0+ agent of rabies belongs to them
1- Ebola virus belongs to them
2+ the genus Lyssavirus belong to them
3+ rabies virus infects all warm-blooded animals
4- the most important reservoirs of lyssavirus in the EU are dogs and foxes
5- rabies virus can be transmitted to humans only from cat-like and dog-like carnivorans
6- lyssavirus form Negri bodies in the cells of salivary glands
7+ rabies virus initially replicates in muscle cells
8- lyssavirus invades to the CNS haematogenously
9+ CNS damage by rabies is prevented by post-exposition active and passive immunisation

3030HIV
0+ contains reverse transcriptase
1+ is transmitted parenterally
2- can be transmitted by ticks and mosquitoes
3+ genome of HIV integrates to the host-cell genome
4+ binds to the CD4 antigen of leukocytes
5- infects both T and B lymphocytes
6+ is transported throughout the body by infected macrophages
7- is the agent of T-cell leukaemia
8- specific antibody in the serum confirms immunity to HIV
9- HIV infection is preventable by vaccination

3031AIDS
0- is acute self-limited disease
1+ is transmitted by sexual contact and needles contaminated by blood
2+ is transmitted transplacentally and perinatally
3+ develops after failure of cell-mediated immunity
4- develops after considerable decrease of B-lymphocytes level
5- is a consequence of innate immunity failure
6- AIDS is a primary stage of HIV-infection
7+ AIDS can be presented also by a degenerative CNS disease (infected are glial cells)
8+ treatment is life-long, with combination of antiretrovirals
9- recovery from AIDS leads to life-long immunity

3032Coronaviruses
0+ cause infections of upper airways
1+ cause severe acute respiratory syndrome (SARS)
2+ cause gastroenteritis
3- cause chronic hepatitis
4- cause exanthematous diseases
5- severely damage the development of foetus
6- cause disease only in animals
7- cause only a mild disease in humans

8- cause myocarditis in children
9+ cause COVID-19

3033Togaviruses
0- all are transmitted by arthropods
1- can cause only infections of CNS
2+ Alphavirus and Rubivirus genera belong to them
3+ the majority of infections caused by alphaviruses is asymptomatic
4+ alphaviruses may cause encephalitis in humans
5+ alphaviruses may cause febrile illness with arthralgia and exanthema in humans
6+ alphaviruses are most frequently transmitted by mosquitoes
7+ infection caused by togaviruses stimulate life-long immunity
8- are non-enveloped RNA viruses
9- are enveloped DNA viruses

3034Rubivirus
0+ is transplacentally transmissible and teratogenic
1+ congenital infection is presented by deafness, cataracta, heart defects and mental retardation
2+ is transmitted by respiratory droplets
3+ infection stimulates life-long immunity
4+ live attenuated vaccine is used in prevention of rubella
5- inactivated vaccine is used in prevention of rubella
6+ vaccination against rubella is included in regular vaccination schemes in the EU
7- the first dose of vaccine is applied in 13^{th} year of age
8- diagnostics of rubella is based predominantly on the clinical picture
9+ intrauterine infection is confirmed by detection of specific IgM antibody in neonate

3035Papillomaviruses
0- are non-enveloped RNA viruses
1+ are non-enveloped DNA viruses
2+ cause skin warts (frequently in school-age children)
3+ cause sexually transmitted disease
4+ some genotypes participate on development of cervical carcinoma
5+ can cause laryngeal lesions
6- cause syncytia production
7- produce intranuclear Guarnieri inclusion bodies
8- cause viremia during infection
9- infection caused by them is diagnosed by specific IgG and IgM detection in serum

3036Polyomaviruses
0- are enveloped RNA viruses
1+ are non-enveloped DNA viruses
2+ may cause progressive multifocal leukoencephalopathy
3+ JCV infects also oligodendrocytes
4+ invade to the host cells by endocytosis
5- cause lytic infection of kidney cells

6+ BKV causes latent infection of kidney
7- cause acute glomerulonephritis
8+ JCV except to kidney cells infects also B-lymphocytes and monocytes
9- polyomaviruses-caused disease is diagnosed by specific antibody detection in serum

3037Adenoviruses
0- are enveloped DNA viruses
1+ are agents of respiratory tract infections
2+ are agents of acute viral diarrhoea
3+ are agents of conjunctivitis
4+ are transmitted also by direct contact
5+ are transmitted by contaminated water and fomites
6- can be transmitted perinatally
7- adenoviral diarrhoea is diagnosed by specific antibody detection
8- are oncogenic for humans
9- regularly cause latent infections

3038Exanthematous diseases are regularly caused by
0+ variola virus
1+ varicella-zoster virus
2+ morbilli virus
3+ rubella virus
4+ erythrovirus (parvovirus B19)
5- polioviruses
6- hepatitis viruses
7- rabies virus
8- noroviruses
9- influenza viruses

3039To the frequent agents of viral respiratory tract infections belong
0+ paramyxoviruses
1+ rhinoviruses
2+ influenza viruses
3- rotaviruses
4- human immunodeficiency virus
5+ coronaviruses
6+ adenoviruses
7- rabies virus
8- HTLV-1 and 2
9+ Epstein-Barr virus

3040To the frequent agents of viral diarrhoea belong
0+ rotaviruses
1+ adenoviruses
2+ caliciviruses
3+ astroviruses
4- hepatitis-B virus

5- paramyxoviruses
6- hepatitis-A virus
7- arboviruses
8- papillomaviruses
9+ noroviruses

3041Acute viral infectious diseases of CNS may be caused by
0+ enteroviruses
1+ ECHO viruses
2+ arboviruses
3+ herpes simplex viruses
4- rhinoviruses
5- prions
6- hepatitis-B virus
7- rotaviruses
8- papillomaviruses
9+ parotitis virus

3042To the agents of viral urogenital infections belong
0+ herpes simplex viruses
1+ molluscum contagiosum virus
2+ adenoviruses
3+ papillomaviruses
4+ hantaviruses
5- polioviruses
6- hepatitis-B and C virus
7- arboviruses
8- rubella virus
9- paramyxoviruses

3043Congenital infections may be caused by the following viruses
0+ rubella virus
1+ cytomegalovirus
2+ erythrovirus (parvovirus B19)
3+ human immunodeficiency virus
4+ hepatitis-B virus
5- hepatitis-A virus
6- rotaviruses
7- rhinoviruses
8- caliciviruses
9- adenoviruses

3044The following viruses are transmitted mostly by respiratory droplets
0- rabies virus
1- rotaviruses
2+ adenoviruses
3+ orthomyxoviruses

4- hepatitis-A virus
5- hepatitis-B virus
6+ parotitis virus
7- human immunodeficiency virus
8- papillomaviruses
9+ rubella virus

3045Intestinal tract is the usual way of entry for
0+ enteroviruses
1+ some reoviruses
2+ some adenoviruses
3+ rotaviruses
4+ hepatitis-A virus
5+ polioviruses
6- morbillivirus
7- hepatitis-B and -C virus
8- West-Nile virus
9- herpes simplex viruses

3046Conjunctiva may be the way of entry for
0+ adenoviruses
1+ herpes simplex viruses
2+ poxviruses
3+ coxsackieviruses-A
4- alphaviruses
5- tick-borne encephalitis virus
6- astroviruses
7- rotaviruses
8- hepatitis-C virus
9+ coronaviruses

3047The following viruses can be transmitted by saliva
0+ rabies virus
1+ herpes simplex viruses
2+ cytomegalovirus
3+ Epstein-Barr virus
4- rotaviruses
5- tick-borne encephalitis virus
6- astroviruses
7- yellow fever virus
8+ parotitis virus
9- West Nile virus

3048The following viruses are arthropod-borne
0+ tick-borne encephalitis
1+ dengue virus
2+ yellow fever virus

3- hantaviruses
4+ Zika virus
5- adenoviruses
6- polioviruses
7- human immunodeficiency virus
8- hepatitis-B and C virus
9+ West Nile virus

3049Parenteral transmission is typical for the following viruses
0+ hepatitis-B virus
1+ cytomegalovirus
2+ erythrovirus (parvovirus B19)
3+ prion diseases
4+ human immunodeficiency virus
5- rotaviruses
6- polioviruses
7- papillomaviruses
8- virus molluscum contagiosum
9- hepatitis-A virus

3050The following viruses can spread in the body by neuronal transport
0+ rabies virus
1+ herpes simplex virus
2+ varicella-zoster virus
3- adenoviruses
4- parvoviruses
5+ agent of shingles
6- rotaviruses
7- paramyxoviruses
8- coronaviruses
9- Epstein-Barr virus

Mycology
4001Yeasts and yeast-like forms of fungi
0+ The cytoplasmic membrane contains ergosterol
1- The cell wall contains endotoxin
2+ The cell has mitochondria and a nucleus with nuclear membrane
3- Have no cell walls
4- Are gram-negative after Gram staining
5+ Multiply by budding
6- Are generally susceptible to antibacterial drugs
7+ Can cause mucosal mycoses after treatment with broad-spectrum antibiotics
8- Germ tube test is not used in their diagnostics
9+ New species of the genus Candida are identified by the MALDI - TOFF method

4002The typical agents of mycoses of skin and dermal adnexes are
0+ Aspergillus sp. (in the external ear channel)

1+ Trichophyton sp.
2+ Microsporum sp.
3- Cryptococcus neoformans
4- Pneumocystis jiroveci
5+ Candida albicans
6+ Malassezia furfur
7+ Epidermophyton sp.
8- Sporothrix schenckii; causes only dermatomycoses
9- Claviceps purpurea

4003Dermatophytes
0+ Parasitize on the skin, nails and hair
1- Frequently cause deep and systemic mycoses as well
2+ They are keratophillic
3- Frequently cause inflammations of mucosal surfaces
4- Epidermophyton floccosum can only be found on nails and hair
5+ KOH preparation is used in their microscopic diagnostics
6- The final reading of culture results is performed after 24-48 hours
7- Swab from the lesion is sent for the mycological examination
8+ In the therapy of dermatomycoses we can use terbinafin locally
9+ outside the host, they remain viable for several years

4004Cryptococcus neoformans
0+ Can cause pneumonia and lethal meningitis
1- Does not cause primary mycoses in healthy people
2+ Defects in cellular immunity and phagocytosis predispose to infection
3+ The thick mucopolysaccharidic capsule is a virulence factor
4- Is a part of the normal microbial flora of humans
5+ Microscopy and cultivation are the basic diagnostic procedures
6- The most frequent way of infection is by fecal-oral route
7+ is the cause of „European blastomycosis“
8- shows increased resistance to antifungals
9- is the causal agent of superficial mycoses

4005Histoplasmosis
0- Specific antibodies have a protective role in the infection
1- The disease human-to-human transmission mode
2+ Inhalation of spores is the most common way of the infection
3+ Cellular immunity has a protective role
4+ Exposure to the casuative agent may be proved by the histoplasmin skin test
5- Wound is the most frequent site of entry
6+ It is caused by dimorphic fungal agent
7+ the most common clinical form is primary pulmonary histoplasmosis
8- The disease is diagnosed using the GTT test
9- is considered as an invasive fungal infection

4006Candida albicans

0+ Causes diseases in patients with defects of T-cellular immunity
1+ Humoral immunity is not protective
2- In the Gram stain the yeast is typically gram-negative
3+ May cause superficial, as well as and systemic mycoses
4- Is never a part of the normal microbial flora of humans
5+ Sabouraud agar is used for cultivation
6- The final culture results evaluation is performed after 24 hours
7- Causes mucosal infections only (skin and nails can not infect)
8+ Can cause a disease in patients with disorders of phagocytosis
9- causes a less severe GTT infection

4007Which of the following are antimycotics?
0+ Miconazol
1+ Clotrimazol
2+ Econazol
3+ Ketoconazol
4+ Nystatin
5+ Griseofulvin
6+ Amphotericin B
7- Mupirocin
8- Tetracycline
9- INH

4008Pneumocystis jiroveci
0- The infection is transmitted by alimentary route
1+ The infection is transmitted by airborne route (aerosols)
2+ Man is usually the source of infection
3+ The microorganism parasitize in the pulmonary interstitium
4+ A clinically manifested infection arises only by decreased immunity
5- The infection does not induce production of antibodies
6- Pseudocysts are frequently found in the brain
7- The infection is transferred by coprophagous vectors
8+ The microorganism may be detected microscopically in sputum
9- is the cause of localized skin lesions

4009Aspergillus sp.
0- Are primarily pathogenic
1- Source of infection is usually soil contaminated by bird excrements
2+ The respiratory tract may be the site of entry for the infection
3- Frequently cause nosocomial infection
4- Aflatoxins are the virulence factors
5- Produce alpha-toxins
6+ Causes opportunistic mycoses
7+ The infection by Aspergillus can be detected by serology
8+ is commonly prevalent in nature
9- liver cancer is a serious complication

4010Typical cauative agents of superficial mycoses are
0- Sporothrix schenckii
1+ Malassezia furfur
2+ Piedra hortae
3- Histoplasma capsulatum
4- Mucor sp.
5+ Microsporum sp.
6- Blastomyces dermatitis
7+ Trichophyton mentagrophytes
8- Aspergillus fumigatus
9+ Epidermophyton sp.

4011The following specimens can be sent for the diagnostics in the cases of deep mycoses
0- Skin scrapings
1+ Pleural punctuate
2- Swabs from skin and from mucosal surfaces
3+ Sputum
4+ Serum for antibody detection
5+ Urine
6- Parts of infected nails
7+ Liquor
8- Epilated hairs
9+ Serum for antigen detection

4012Systemic mycoses are most frequently caused by
0+ Histoplasma capsulatum
1- Malassezia furfur
2- Sporothrix schenckii
3+ Mucor sp.
4- Trichophyton sp.
5+ Rhizopus sp.
6+ Candida sp.
7- Microsporum sp
8+ Aspergillus sp.
9- Epidermophyton sp.

4013The most common toxins in acute mycotoxicosis include
0+ Aflatoxins
1- Shiga toxin
2+ Ochratoxins
3- Fumonisins
4+ Fusarium toxins
5- GM1 toxin
6+ Citrinin
7- Enterotoxin
8+ Ergot alkaloids
9- Asbestos

4014Filamentous fungi are dangerous for people with impaired immunity and chronic diseases. Allergic potential have hyphomycetes of the genus

0+ Aspergillus
1- Malassezia
2+ Penicillium
3+ Fusarium spp
4+ Cladosporium
5- Cryptococcus neoformans
6+ Yeast
7+ zygomycetes of the genus Mucor
8+ zygomycetes of the genus Rhizopus
9- Mycomax

4015In candidiasis, the risk groups include the following patients

0+ oncology patients
1+ transplant patients
2- alcoholics
3+ Low birth weight infants
4+ premature babies
5+ diabetics
6+ patients after surgery
7+ immunocompromised patients
8+ patients with AIDS
9- allergic patients

Parasitology

5001Regarding *Plasmodium (P.) species*, which of the following is most accurate?

0+ The protozoan parasites are transmitted by the bite of female anofeline (*Anopheles spp.*) mosquitoes
1+ While feeding a blood meal the vector injects sporozoites into the bloodstream
2- Both male and female gametocytes are formed in the vector and are injected into the person while feeding blood
3- Hypnozoit are produced by *P. falciparum* and can cause relapses of malaria after the acute phase is over
4+ Species identification of *Plasmodium spp.* Is imoportant for therapy
5- Malaria caused by P. vivax is characterised by a cerebral malaria
6+ There is no comercially available vaccine against malaria parasites
7- Malaria parasite are imoprtted to Europe by birds
8+ While feeding a blood meal the vector injects merozoites into the bloodstream
9+ Plasmodium vivax a P. ovale may cause replasing malaria

5002*Giardia intestinalis*

0+ Causes nonbloody diarrhoea
1- Trophozites are transmissmited by fecal oral route
2+ Causes malabsorption of fats
3+ Trophozites and cysts are searched for accurate diagnostics

4- The drug of choice is Albendazol
5- Cause bloody diarrhoea
6- Causes meningitis
7+ The drug of choice is metronidazole
8- The drug of choice id miltefosin
9- Transmitted by cystes

5003Regarding Cryptosporidium parvum which of the following are most accurate?
0- Causes bloody diarrhoea
1+ Causes last long severe diarrhoea in HIV+
2- Transmission is by ingestion of raw meat
3+ There are RDTs available foe detection of antigen
4- Human aquires *C. parvum* by biting of insects
5- Transplancental route of infection is also known
6+ The drug of choice is nitazoxanide
7+ *C. parvum* belongs to Apicomplexa
8+ transmitted by water
9- The parasite is imported from Africa to Europe

5004Regarding *T. gondii*, which of the following is most accurate?
0+ Avoid pregnant women not to clean little boxes from cats
1- Tachyzoites are present in tissue cysts
2+ The definitive host of the parasite are domestic cats and catsfeline
3- The parasite causes nonbloody diarrhoea
4- The parasite enters to red blood cells (RBC)
5+ The parasite enters to all cells which have nucleus
6+ For routine laboratory diagnostics of toxoplasmosis, antibodies detection tests are used
7- Toxoplasma gondii cause abortion in all infected pregnant women
8- *T. gondii* is imoported to Europe from tropics
9+ *T. gondii* is not possible to eradicate

5005*Trichomonas vaginalis*
0- *Trichomonas vaginalis* is cause nosocomial infection
1- Causes nosocomila infection
2- CSF is needed for laborytory dignostics of trichomiasis
3+ The drug of chice is metronidazol
4+ The trasmission route is mainly by sexual intercorse
5+ For laboratory diagnostics urethral and or vaginal swab is sent to the laboratory
6- Finding of cysts reveal the disease
7+ *Trichomonas vaginalis* is found only as trophozoites
8+ The drug of choice is metronidazole
9+ Found only in human

5006Reagrding *Taenia solium*, which of the following is most acurrate?
0+ *Taenia solium* has four suckers and a circle of hooklets
1- The drug of choice for the adult helminth is artesunate
2+ The drug of choice is albendzole

3+ cysticercosis cause psychaiatric problems
4- The cysticercus of *T. solium* contains the mature eggs of the parasite
5- mature tapeworms are found in pig´s
6- The defintive hosti s a cat
7+ laboratory diagnostics is based on evidence of antibodies
8+ The parasite is missing in the region where consumtion of pork is prohibitted
9- cysticercosis was eliminated from Europe

5007*Echinococcus granulosus* or dogs Hadatids tape worm- Causative agent of unilocular hadatid disease and treatment
0+ definitive host – Dogs and other carnivora
1- Infective stage – Fertile hadatid containing fully developed scolex
2+ Sheep and man - dead end hosts
3+ Man is infected by ingestion of Eggs passed by dogs
4- The drug of choice is metronidazole
5+ The drug of chice is albendazol for recent infection up to 6 month
6+ older hydatid cysts must be removed from organs by surgical intervention
7- Man is infected by ingestion of eggs passed from infected human feaces
8- *Echincocosis* is not present in middle Europe
9+ For laboratory diagnostics antibodies detection tests are used

5008The vectors of malaria parasites are
0- *Aedes mosquitoes*
1+ *Anopheles stephensi*
2- *Culex mosquitoes*
3+ *Anopheles maculipennis*
4- *Phlebotomus spp.*
5+ *Anopheles hyrcanus*
6- *Lutzomyia spp.*
7+ *Anopheles gambiae*
8- *Pediculus humanus*
9- *Simulium* spp.

5009Ticks transmit
0- *Leishmania infantum*
1+ Rocky Mountains Spotted Fever
2+ *Babesia sp*.
3- *Plasmodium spp*.
4- *Rickettsia prowazekii*
5- *Borrelia recurrentis*
6+ *Coxiella bruneti*
7+ Tick Borne Encepahlitis Virus
8+ *Borelia sp.*
9- west nile virus

5010Mosquites transmit
0+ *Plasmodium spp.*

1- *Lieshmania spp.*
2+ malaria parasites
3- *Trypanosoma spp.*
4- papatasi virus
5+ Zika virus
6+ Yellow Fever virus
7- *Onchocerca volvulus*
8- COVID-19
9+ Dengue virus

Klimik

6001Microbiota of human body

0- is stable and during the life cannot change
1- is not influenced neither by food composition nor by external environment
2- is not influenced by antibiotic treatment
3+ supports the proper development of immune system
4+ by colonisation resistance protects from pathogens
5- protects from infection of decubiti
6+ is a source of endogenous infections
7+ helps to digest some components of food
8+ may convert food components to carcinogenic compounds
9- all microbes of the human microbiota are commonly cultivable

6002The "healthy" human microbiota contains

0+ Streptococcus mutans in oral cavity
1- Escherichia coli in large intestine of neonate
2+ Lactobacillus spp. in intestine of breast-fed 2 month-old infant
3+ oral treponemae and non-pathogenic mycoplasmae in oral cavity
4- Streptococcus mutans permanently colonising bronchioles and alveoli
5+ Fusobacterium spp. in intestinal tract of adults
6- Proteus spp. in stomach of adults
7+ Staphylococcus epidermidis in distal part of urethra
8+ bacteriophages on colonised mucosae of humans
9- Streptococcus pyogenes in tonsillar crypts

6003Oral microbiota of healthy human may contain

0+ Candida albicans in low amounts
1- Candida spp. massively
2+ Actinomyces spp. in subgingival plaque
3- Actinomyces spp. colonising the buccal mucosa
4+ viridans streptococci massively
5- Neisseria meningitidis
6+ HACEK group in dental plaque
7- anaerobic sporulating bacteria
8+ the mixture of microorganisms organised in biofilm
9- anaerobic non-sporulating bacteria in supragingival dental plaque

6004To respiratory tract microbiota of healthy human (non-carrier) belong

0- Staphylococcus aureus on the nasal and nasopharyngeal mucosa
1+ Staphylococcus epidermidis on the nasal and nasopharyngeal mucosa
2- Streptococcus pyogenes and Neisseria meningitidis on nasopharyngeal mucosa
3- Pseudomonas aeruginosa biofilm in lungs
4+ lower respiratory tract without stabile microbial colonisation
5+ Neissera sicca and N. mucosa on the oropharyngeal mucosa
6- Haemophilus influenzae in paranasal sinuses
7- Corynebacterium diphtheriae on the nasopharyngeal mucosa
8+ viridans streptococci transiently in trachea
9+ Corynebacterium xerosis on nasopharyngeal mucosa

6005Gastrointestinal microbiota of healthy humans

0+ its composition has impact on natural protection of the body
1- in proximal part of small intestine dominate anaerobic bacteria
2+ in distal ileum and colon prevail anaerobic bacteria
3- the main part of large intestine microbiota represents Escherichia coli
4+ the lowest numbers of microorganisms are found in stomach and duodenum
5- cultivation of C. albicans and P. aeruginosa in any amount from stool confirms dyspepsia
6- in large intestine of infant prevail Bacteroides spp. and Escherichia coli
7- presence of Helicobacter pylori in human stomach is physiological
8+ changes of intestinal microbiota may result in dyspepsia
9- stomach should always be sterile

6006Diarrhoea can be caused after overmultiplication of

0+ Candida spp.
1+ Pseudomonas aeruginosa
2+ Clostridium difficile
3+ Staphylococcus aureus
4+ Citrobacter spp.
5- Enterococcus faecium
6- Lactobacillus spp.
7- Streptococcus bovis
8- Escherichia coli (non-pathogenic strains)
9- Bifidobacterium spp.

6007Microbiota of skin and skin adnexa of healthy humans

0- colonise evenly all areas of skin
1+ around borders with mucosae contains microbes colonising the particular mucosa
2+ predominantly contains staphylococci and corynebacteria
3- contains mostly GNNFB, streptococci and anaerobic bacteria
4+ in skin gland ducts contains G+ anaerobic cocci and cutibacteria
5+ skin folds may be colonised by yeasts
6- predominantly contains Candida species
7- Malassezia furfur is present on skin only during infection

8+ is a source of wound infections and catheter-related sepsis
9- can be totally removed by disinfection before operation

6008Genital microbiota of healthy fertile women
0+ contains bacteriophages
1+ is a source of neonatal microbiota
2- is not influenced by hormonal changes during the woman's life
3+ contains predominantly lactobacilli
4- all Lactobacillus species on vaginal mucosa are equally useful
5- the most important antibacterial factor of lactobacilli is biofilm production
6+ can contain small amounts of Candida and Gardnerella
7+ can contain enterococci and viridans streptococci
8- can contain small numbers of Neisseria gonorrhoeae
9- physiologically contains Trichomonas vaginalis

6009Women or her newborn may be threaten by the following microbes colonising vagina
0- Staphylococcus aureus (toxic shock of the neonate)
1+ Staphylococcus aureus (neonatal conjunctivitis and skin infections)
2+ Streptococcus agalactiae (neonatal pneumonia, sepsis and meningitis)
3- Lactobacillus spp. (increased risk of dental caries in neonate)
4- Gardnerella vaginalis and Atopobiun vaginae (non-gonococcal cervicitis)
5+ Gardnerella vaginalis and Mobiluncus spp. (bacterial vaginosis after overmultiplication)
6+ Candida albicans (candidosis after overmultiplication)
7+ urogenital mycoplasmae (inflammation and infertility after overmultiplication)
8- Staphylococcus epidermidis (neonatal conjunctivitis and skin infections)
9- Corynebacterium diphtheriae (neonatal diphtheria)

6010Urinary tract microbiota of healthy humans
0+ is found on distal urethra
1+ is a source of mid-stream urine contamination
2+ may be a reservoir for urinary tract infections
3+ contains microorganisms colonising vagina, large intestine and perineum
4+ is regularly washed away by urine flow
5- physiologically ihabits urinary bladder and ureters
6- in prevalence contains spore-forming anaerobic bacteria
7- regularly contains Chlamydia trachomatis
8- in healhy humans never contains mycoplasmae and ureaplasmae
9- regularly contains uropathogenic Escherichia coli strains

6011Healthy carriers may harbour the following (potentially) pathogenic bacteria
0+ Streptococcus pyogenes on skin and respiratory mucosa
1- Prevotella melaninogenica in skin glands
2- Toxoplasma gondii in tissue cysts
3+ Boredtella pertussis on respiratory mucosa
4- Leptospira Icterohaemorrhagiae in kidney
5+ Salmonella Typhi in gall bladder

6+ Staphylococcus aureus on nasopharyngeal mucosa
7- Candida albicans in intestinal tract
8- Mycobacterium tuberculosis in lungs
9+ Neisseria meningitidis on nasopharyngeal mucosa

6012Tonsillitis
0- only palatine tonsils can be infected
1- the most common agents of acute tonsillitis are staphylococci and pneumococci
2+ abrupt onset of tonsillitis is typical for group-A streptococci
3+ nasopharyngeal tonsil infection is frequent especially in children
4+ Plaut-Vincent angina is a mixed endogenous unilateral tonsillitis
5+ diphtheric tonsillitis is characterised by pseudomembrane formation
6- clinical symptoms of tonsillitis can be caused only by bacterial infections
7- Plaut-Vincent angina is a necrotising infection of both palatine tonsils
8- it is not necessary to treat tonsillitis caused by S. pyogenes by antibiotics
9+ S. pyogenes antigen detection in tonsillar swab belong to rapid diagnostic methods

6013Otitis media (OM) in children
0- most frequently occurs in summer
1+ is usually connected to local immunodeficiency
2+ if OM originates in deep dental caries, the agents are usually anaerobic bacteria
3+ can be caused by Staphylococcu aureus, Alloiococcus otitis and Turicella otitis
4- occurs more frequently in adults than in children
5+ in children is most frequently caused by S. pneumoniae, H. influenzae and M. catarrhalis
6- frequently is caused by L. monocytogenes and M. tuberculosis
7- in the therapy of OM are preferred bacteriostatic antibiotics
8+ is more frequent in children due to anatomical characteristics of their eustachian tube
9+ when searching for predispositions, allergy should be considered as well

6014Otitis media is usually caused by
0+ Streptococcus pneumoniae
1+ Haemophilus influenzae
2+ Moraxella catarrhalis
3+ Streptococcus pyogenes
4+ Staphylococcus aureus
5- Bordetella pertussis
6+ anaerobic non-sporulating bacteria
7- rotaviruses
8- SARS-COV-2
9- rhinoviruses

6015Acute laryngitis and tracheitis
0+ the most common agents are viruses
1- are mostly endemic
2+ they are manifested by coughing, hoarseness and loss of voice
3- usually are caused by mycobacteria and mycoplasmas

4- bacterial superinfection has usually exogenous source
5+ can be caused by Chlamydia pneumoniae
6+ are caused by paramyxoviruses, RSV, adenoviruses and influenza viruses
7- frequently are caused by rhinoviruses, poxviruses and herpesviruses
8+ superinfections are mostly caused by staphylococci, streptococci and haemophili
9+ microbiologic examination is based on quantitative detection of the agent

6016Pneumonia
0- Mycoplasma pneumoniae is the agent of lobar pneumonia
1- the main virulence factor of S. pneumoniae is a protein capsule
2- viral pneumoniae are more frequent in adults
3+ during staphylococcal pneumonia lung abscesses can be formed
4+ biofilm is an important virulence factor in ventilator associated pneumonia
5+ secondary bacterial pneumonia may arise during influenza
6+ mycotic pneumoniae are typical for children with immunodeficiency
7- therapy of mycoplasmal pneumonia is based on cefalosporins or penicillins
8+ nosocomial pneumonia may be caused by P. aeruginosa and Acinetobacter spp.
9- pneumonia caused by SARS-CoV-2 is successfully treatable by ribavirin

6017To the agents of pneumonia belong
0+ Coxiella burnetii
1+ Bacillus anthracis
2+ Yersinia pestis
3- Streptococcus mutans
4- Aspergillus spp. in immunocompetent host
5+ Pneumocystis jiroveci in immunocompromised host
6- Clostridium difficile
7- Mycobacterium ulcerans
8+ Haemophilus influenzae
9+ Candida albicans in immunocompromised host

6018Pneumonia may be (usually) caused by
0- Corynebacterium diphtheriae
1+ Chlamydia psittaci
2- Clostridium botulinum
3- Cryptosporidiae
4- Mycoplasma hominis
5- Streptococcus mutans
6+ Legionella spp.
7+ Pseudomonas aeruginosa
8+ Staphylococcus aureus
9+ coronaviruses

6019Microbiologic diagnostics of pneumonia is based on
0+ microscopic examination of sputum
1+ microbial antigen detection in material from lower airways (influenzavirus, RSV)

2- detection of capsular antigens in sputum (klebsiellae and pseudomonas)
3+ microbial antigen detection in urine (L. pneumophila type 1 and pneumococci)
4+ sputum culture
5- culture of oral swab (to exclude sputum contamination during sampling)
6+ haemoculture
7- ASLO quantification in serum
8- specific antibody detection is serum (against pneumococci and haemophili)
9+ microbial nucleic acid detection in nasopharyngeal swab (SARS-CoV-2)

6020Bacterial complications of influenza are usually caused by
0+ Haemophillus influenzae
1+ Streptococcus pneumoniae
2+ Staphylococcus aureus
3- Mycobacterium tuberculosis
4- Actinomyces israelii
5- corynebacteria
6- anaerobic cocci
7- lactobacilli
8- enterococci
9- Nocardia asteroides

6021Atypical pneumonia
0- is characterised by purulent sputum production
1+ is characterised by dry non-productive cough
2- is usually caused by S. pneumoniae, K. pneumoniae and H. influenzae
3+ is usually caused by M. pneumoniae, C. pneumoniae and L. pneumophila
4- is transmitted by respiratory route; infected humans are the only source of infection
5+ is diagnosed by detection of microbial nucleic acid in the sample from lower airways
6- is diagnosed by sputum culture on blood agar
7+ is diagnosed by specific antibody detection in serum of patient
8- is treated by penicillins, cefalosporins or vancomycin
9+ is treated by macrolides, tetracyclines or fluoroquinolones

6022Mark the correct pairs
0- Legionella pneumophila - interhuman transmission
1+ Q-fever pneumonia - zoonosis
2- Chlamydia psittaci - frequent agent of nosocomial pneumonia
3- pneumonic form of tularemia - arise only after airborne transmission
4+ pneumococcal pneumonia - secondary, after influenza
5+ Pseudomonas aeruginosa - lung infection in cystic fibrosis
6- Chlamydia pneumoniae - effective vaccine is available
7+ Chlamydia trachomatis D-K - neonatal pneumonia
8+ Streptococcus pneumoniae - effective vaccine is available
9+ Pneumocystis jiroveci - pneumonia in patients with defective cell-mediated immunity

6023On dental caries and periodontitis development participate

0- Streptococcus pyogenes
1+ Streptococcus mutans
2+ Lactobacillus spp.
3+ Actinomyces spp.
4- Streptococcus agalactiae
5+ Porphyromonas gingivalis
6- Enterobacter aerogenes
7+ Fusobacterium spp.
8- Staphylococcus epidermidis
9- Veillonella spp.

6024Bacterial sepsis
0+ is a result of dysregulated systemic inflammatory response to the infectious agent
1- is not influenced by the underlying diseases, state of immunity, etiology and therapy
2+ is mediated by microbial endotoxin activity
3+ is characterised by tachycardia, hyperventilation, altered temperature and mentation
4- anaerobic bacteria are not able to cause sepsis
5- sepsis cannot be caused by opportunistically pathogenic microorganisms
6- there is no risk that secondary septic focuses will arise during sepsis
7+ can be monitored by CRP, procalcitonin and presepsin levels monitoring in serum
8- bacterial agent of sepsis is always detectable in haemoculture
9+ surgical eradication of infectious focuses is important supplement to ATB therapy

6025Pathogenesis of sepsis and septic shock
0+ sepsis can be caused by both primary and opportunistically pathogenic agents
1- septic shock is more frequently caused by G+ bacteria
2+ proinflammatory cytokines are produced during sepsis and cytokine storm is developing
3- teichoic acid plays important role in pathogenesis of sepsis caused by G- bacteria
4+ dysregulated NO production by vascular endothelium ich typical for septic shock
5- advanced form of septic shock is still successfully treatable by antibiotics
6+ non-regulated activation of haemocoagulation, kinin and complement system is typical
7- in sepsis pathogenesis, PMNL activation is more important than endothelium reactivity
8+ refractory septic shock is characterised by persistent hypotension
9+ to important mediators of sepsis belong TNF, IL-1, IL-6, IL-8 and IL-12

6026To the common agents of infectious endocarditis belong
0- Clostridium difficile
1+ Staphylococcus aureus
2+ Aggregatibacter actinomycetemcomitans
3- Corynebacterium diphtheriae
4- Neisseria gonorrhoeae
5+ oral viridans streptococci
6- Haemophilus ducreyi
7+ Coxiella burnetii
8+ Enterococcus spp.
9- Helicobacter pylori

6027For microbiologic diagnostics of sepsis is suitable to sample

0- blood for detection of specific antibody
1+ blood for haemoculture (before and at the start of body temperature elevation)
2- blood for haemoculture (after the fever dropped to normal body temperature)
3- blood for haemoculture (after the fever spike was reached)
4+ blood from vena cubiti
5- blood, preferentially from vena femoralis
6- blood; clinically significant is bacteremia over 100 000 CFU/ml of blood
7+ except to blood for haemoculture also material from suspected focus of sepsis
8+ optimally three sets of haemoculture, sampled before the fever spike
9+ skin swab from the blood sampling site before the venepuncture

6028Microbiologic diagnostics of sepsis and endocarditis

0- it is not advisable to alternate the venepuncture sites during blood sampling
1+ central venous catheter blood sample must be supplemented by sample from periphery
2+ in endocarditis three sets of haemoculture during 1-2 hours' time interval are sampled
3+ haemoculture must not be cooled after sampling and during transport to the laboratory
4- skin swab from the blood sampling site contains the agent of sepsis
5+ haemoculture interpretation takes in account also the result of skin swab culture
6+ rapid diagnostic tests results help to guide the initial (empiric) therapy
7- microscopic examination of blood is performed immediately after sampling
8- inflammatory mediators monitoring (CRP, procalcitonin) has not clinical relevance
9- ATB therapy of septic patient starts as soon as the susceptibility test results are available

6029Purulent meningitis (PM)

0- PM is caused predominantly by viruses and parasitic protozoa
1+ the agent of PM is detectable by cultivation of liquor collected by lumbar puncture
2+ decreased inflammation of CNS is not reason for ATB doses decreasing
3+ PM may be epidemic
4- PM regularly arises during bacterial sepsis
5+ capsule is an important virulence factor of PM agents
6- spiral bacteria belong to the PM agents
7- PM may rarely be caused also by prions
8+ N. meningitidis, S. pneumoniae, H. influenzae and L. monocytogenes are agents of PM
9+ S. agalactiae, E. coli K1 and L. monocytogenes are frequent agents of neonatal PM

6030Brain abscess

0+ to predisposing factors belong ischaemic focuses in CNS
1+ may arise after septic embolization during endocarditis caused by S. aureus
2+ the agent can be detected in pus sample collected by abscess puncture
3- the initial therapy is based on application of acyclovir in high doses
4- can arise only after haematogenous spread of infectious agent
5- brain abscess is a typical lesion of tertiary syphilis
6- cannot be caused by filamentous bacteria
7+ can be caused by anaerobic bacteria

8+ may arise after spreading of dental infection to CNS
9- the sample from brain abscess is examined only by anaerobic cultivation

6031Viral infections of CNS
0+ virus may enter to CNS by retrograde axonal transport
1+ in liquor prevail mononuclear leukocytes
2+ parallel samples of blood and liquor are collected for specific antibody detection
3- therapy is based on broad-spectrum antibiotics application
4+ viral genome detection in liquor by PCR is used in diagnostics
5- on the contrary to bacterial meningitis, viral meningitis is more acute
6+ viral infections of CNS are usually biphasic
7+ on the contrary to bacterial meningitis, viral meningitis is usually milder
8- usually are characterised by purulent inflammation
9+ viral meningoencephalitis may be endemic

6032To the common agents of viral meningitis belong
0+ coxackieviruses
1- variola virus
2+ parotitis virus
3+ HSV-2
4+ CMV and VZV in immunocompromised people
5- papillomavirus
6- coronavirus
7- rabies virus
8+ echoviruses
9- noroviruses

6033To the common agents of aseptic meningitis belong
0+ coxackieviruses and echoviruses
1- rubellavirus
2- Haemophilus influenzae
3- Streptococcus agalactiae
4+ Borreliella burgdorferi
5+ Leptospira interrogans
6- rhinoviruses
7+ parotitis virus
8+ rickettsiae
9- Taenia solium

6034CNS infections of parasitic origin
0+ cysticercosis and cystic echinococcosis belong to them
1- cryptococcal meningoencephalitis belongs to them
2+ larval parasitoses of CNS are diagnosed by specific antibody detection
3- cysticercosis of CNS is microbiologically confirmed by positive liquor culture
4+ wet-mount preparation of liquor is used for detection of amoebic CNS infection
5+ toxoplasmosis of CNS is typical in patients with deficiency of cell-mediated immunity

6- toxoplasmosis of CNS is diagnosed by microscopic examination and cultivation of liquor
7- cryptosporidia and Pneumocytis jiroveci belong to the agents of parasitic CNS infections
8+ Trypanosoma brucei and Plasmodium falciparum may cause parasitic CNS infections
9- microsporidia cannot cause parasitic CNS infections

6035Prion diseases
0+ incubation time may last even years
1- their agents stimulate specific IgM production
2+ their clinical presentation is a result of neurons degeneration
3- they are result of autoimmune inflammation
4- their agents are transmitted by respiratory droplets
5+ Kuru and Creutzfeldt-Jakob disease belong to them
6- rabies and herpes zoster belong to them
7+ are not treatable
8+ are transmissible from human to human
9- patients with prion disease have positive skin test (triggered by the agent of disease)

6036Degenerative CNS diseases of viral and prion origin
0+ are not treatable
1- can be caused by arboviruses
2+ can develop as a consequence of immune response against infected neurons
3+ may arise as a result of pathologic prion protein activity on neurons
4+ may develop several years after primary infection caused by morbillivirus
5+ may be caused by viral infection of oligodendrocytes
6+ progressive multifocal leukoencephalopathy (PMLE) caused by JC-virus belongs to them
7- sleeping sickness and rabies belong to them
8- all are preventable by vaccination
9- biologic treatment that suppress cell-mediated immunity does not predispose to PMLE

6037Mark the correct pairs (agent-type of meningitis)
0+ Streptococcus pneumoniae – purulent
1+ Coxackievirus – aseptic
2- Echovirus - purulent
3- mumps virus - purulent
4+ E. coli - purulent
5- Herpes simplex - purulent
6+ Naegleria fowleri - purulent
7- Leptospira interrogans - purulent
8+ Mycobacterium tuberculosis - basilar
9- Cryptococcus neoformans – autoimmune

6038Microbiologic diagnostics of CNS infections is based on
0- macroscopic evaluation of liquor – during aseptic meningitis is turbid
1+ macroscopic evaluation of liquor – during septic meningitis is turbid
2- detection of specific antibody in liquor during septic meningitis
3+ detection of specific antibody during viral CNS infections

4+ microbial agent genome detection in the liquor sample
5- liquor cultivation during prion diseases of CNS
6+ detection of septic meningitis (bacterial) agents by cultivation of liquor
7- microscopic detection of CNS infection viral agents in liquor
8+ antigen detection of the most frequent agents of septic meningitis in liquor
9+ microscopic detection of septic meningitis bacterial agents in liquor

6039Indirect diagnostics of CNS infections
0+ is used in diagnostics of viral meningoencephalitis
1- is used in diagnostics of purulent meningitis
2- is used in diagnostics of prion CNS diseases
3+ is used in suspected cysticercosis of CNS
4- is used in cryptococcal meningitis of patients with AIDS
5+ is used in diagnostics of CNS infections caused by spirochaetes
6- is used in diagnostics of CNS toxoplasmosis of patients with AIDS
7+ is based on comparison of specific antibody amount in liquor and serum of patient
8+ is based on detection of local production of specific antibody in CNS
9- is used in diagnostics of perinatal meningitis of neonates

6040To the agents of intraocular infections belong
0+ Toxoplasma gondii
1- rhinoviruses
2+ microscopic fungi
3+ Pseudomonas aeruginosa
4+ nocardiae
5- rotaviruses
6+ Bacillus cereus
7+ coagulase negative staphylococci (intraocular lens implants)
8- prions
9- Trichuris trichiura

6041Surgical wound infection (SWI)
0- non-compliance with antisepsis during surgical intervention is a frequent reason for SWI
1+ circulatory and metabolic disorders predispose to SWI
2- operation wound phlegmons are most frequently caused by staphylococci
3+ staphylococcal wound infection is characterised by abscess production
4+ gangrenes are mostly caused by streptococci and anaerobic bacteria
5+ nosocomial wound infections are frequently caused by polyresistant bacteria
6- superficial wound swab is collected for microbiologic examination
7+ sample from SWI must always be examined by anaerobic cultivation
8- systemic ATBs should always be preventively administered before surgical interventions
9- staphylococcal wound infections are typical by crepitation during palpation

6042Traumatic wound infections
0- only visibly contaminated wounds are considered to be infected
1+ deep, soil-contaminated wounds may lead to tetanus

2- traumatic wounds are infected only by exogenous microorganisms
3+ staphylococcal wound infections have usually endogenous origin
4+ tissue devitalisation is important condition for anaerobic infection
5- after animal bite it is always necessary to vaccinate against rabies
6- all traumatic wound infections is enough to treat only conservatively (by antibiotics)
7+ gas gangrene may develop in deep, soil-contaminated wound
8+ wounds can be contaminated in water by Aeromonas hydrophila
9- during wound debridement there is no need for material sampling for culture

6043Burn wound infection (BWI)
0+ may be complicated by herpetic infection
1+ common agents of BWI are P. aeruginosa and S. aureus
2- BWI cannot be caused by anaerobic bacteria
3+ streptococcal infections seriously hamper the skin graft acceptance
4- BWI is frequently caused by filamentous fungi
5- BWI is always treated only locally because it cannot cause septic complication
6- commonly is caused by Cryptosporidium parvum
7+ is complicated by biofilm production in wound
8+ treatment should include wound debridement under antibiotic coverage
9- phage-therapy of BWI is not suitable

6044Decubitus (bed-sore):
0+ is caused by pressure ischaemia, resulting in skin and subcutaneous tissue necrosis
1- belongs to the first symptoms of sepsis
2+ decubitus infection has usually endogenous and nosocomial source
3+ are mostly infected by staphylococci, Pseudomonas aeruginosa and enterobacteria
4- is primarily infected by yeasts and filamentous fungi
5- can be infected by Giardia and Cryptosporidium
6+ on deep decubitus infections may participated anaerobic bacteria as well
7+ therapy of decubitus infections is based on local ATB application and debridement
8+ systemic ATB application is used only when septic complications arise
9- decubitus infection is prevented by application of broad-spectrum antibiotics

6045Symmetric lesion with sharply bordered erythema and oedema on face
0+ is typical for erysipelas
1- is typical for erysipeloid
2+ the agent is Streptococcus pyogenes
3- is a presentation of allergy to Streptococcus pyogenes
4- the agent is Erysipelothrix rhusiopathiae
5- arises after transmission of the agent from pig to human
6- immunity after recovery from this disease is life-long
7+ microbiologic diagnostics is based on culture
8+ empiric therapy is based on penicillin administration
9- if the agent is penicillin-resistant, colistin is applied locally

6046To diseases with typical skin manifestations belong

0+ Lyme borreliosis
1- Creutzfeldt-Jakob disease
2- tick-borne encephalitis
3+ typhoid fever
4- tetanus
5+ scarlet fever
6- botulism
7+ anthrax
8+ syphilis
9- haemolytic-uremic syndrome

6047Pathogenesis of anaerobic infections
0+ endogenous anaerobic infections are frequently polymicrobial
1+ mucosal breaks represent a key factor in pathogenesis of actinomycosis
2- pulmonary actinomycosis is directly related to bronchogenic carcinoma
3- microbial synergy does not play role in polymicrobial anaerobic infection
4+ anaerobic bacteria can produce substances inhibiting functions of phagocytes
5- anaerobic polymicrobial infections are predominated by G+ anaerobic cocci
6+ source of C. tetani-caused infection may be the intestinal microbiota of animals
7- 50% of car-accident-caused contusions contain clostridial spores
8+ tetanospasmin is synthesized in the form of inactive polypeptide chain
9- wound botulism is the most frequent form of botulism

6048Diseases caused by anaerobic bacteria
0+ actinomycosis is endogenously acquired chronic granulomatous process
1+ pelvic actinomycosis may be associated with intrauterine contraceptive device
2- anaerobic bacteria causing pleuro-pulmonal infections come from intestinal microbiota
3- anaerobic bacteria participate on appendicitis only rarely
4+ Fournier gangrene is anaerobic gangrene of perineum and genitals
5- symptoms of botulism start 2 hours after consuming the contaminated food
6+ to symptoms of bulbar paralysis during botulism belong dysphagia and dysarthria
7- incubation period for tetanus varies from a few hours to 2 dyas
8+ diabetic foot is caused by anaerobic non-sporulating bacteria
9- anaerobic bacteria are frequent agents of meningitis

6049Therapy and prevention of anaerobic infections
0+ anaerobic non-spore-formers are mostly susceptible to clindamycin and tetracyclines
1+ therapy of choice during actinomycosis is penicillin
2- Bacteroides is always susceptible to penicillin
3- carbapenems are not effective against medically important anaerobic bacteria
4+ patient with botulism should immediately be treated with anti-botulinum serum
5- during pelvic actinomycosis, the intrauterine contraceptive device can be left in uterus
6+ clostridial myonecroses are treated by surgery, penicillin and anti-gangrene serum
7- tetanus is treated with peroral application of gentamicin
8+ tetanus is prevented by regular vaccination in childhood and revaccination of adults
9- metronidazole is not suitable for treatment of infections caused by anaerobic bacteria

6050Osteomyelitis and arthritis

0+ in children are mostly haematogenous
1- in patients after transplantation are most frequently caused by cytomegalovirus
2+ biofilm production represents a risk in foreign body related osteomyelitis
3+ chronic osteomyelitis focuses contains necrotic tissue with biofilm
4+ open fracture predisposes to osteomyelitis
5+ traumatic micro-hematoma of metaphysis in children predispose to osteomyelitis
6- bacterial diarrhoea predispose to septic arthritis
7- the agent is always detectable in haemoculture
8- frequently are cause by filamentous fungi
9- antibiotic therapy of osteomyelitis should not exceed 10-14 days

6051To the most frequent agents of haematogenous septic arthritis belong

0- Bacillus cereus
1+ Staphylococcus aureus
2- Legionella pneumophila
3+ Neisseria gonorrhoeae
4- Streptococcus mutans
5+ Haemophilus influenzae
6+ Streptococcus pneumoniae
7- Mycoplasma pneumoniae
8- Entamoeba histolytica
9+ Salmonella enterica

6052To the most frequent agents of foreign-body-associated osteomyelitis belong

0- Borrelia burgdorferi
1+ microorganisms of the skin microbiota
2+ cutibacteria
3+ coagulase-negative staphylococci
4+ Staphylococcus aureus
5+ Pseudomonas aeruginosa
6- Mycoplasma hominis
7- Mycobacterium ulcerans
8- Streptococcus agalactiae
9- Haemophilus influenzae

6053Mark the correct pairs (agent-disease)

0- Borrelia afzelii - posttraumatic osteomyelitis
1- Plasmodium malariae - haematogenous arthritis of children in Africa
2+ anaerobic non-sporulating bacteria - jaw bone osteomyelitis
3+ Treponema pallidum - bone and joints damage (tertiary syphilis)
4- Aspergillus spp. - haematogenous arthritis of elderly people
5- Treponema pallidum - joint-implant mediated periimplantitis
6+ Yersinia enterocolitica - reactive arthritis
7+ Yersinia enterocolitica - septic arthritis

8- Acinetobacter spp. - haematogenous osteomyelitis of children
9+ Borreliella burgdorferi - Lyme arthritis

6054Diagnostics and therapy of osteomyelitis (OM)
0+ biopsy is a suitable sample for microbiologic diagnostics of OM
1+ inflammatory exudate aspirations are suitable for microbiologic diagnostics of OM
2- skin swab from the place of fistula orifice is suitable for microbiologic diagnostics of OM
3- acute osteomyelitis always requires also a surgical treatment
4- chronic osteomyelitis can always be successfully treated by antibiotics
5- nitrofurantoin is suitable for treatment of OM caused by G- bacteria
6+ clindamycin is suitable for treatment of OM caused by G+ bacteria
7- for OM treatment is suitable a long-lasting monotherapy with rifampicin
8+ therapeutic phage cocktails can be used in experimental therapy of OM
9+ therapy of chronic OM includes surgical debridement of necrotic tissue

6055Intrauterine infections are mostly caused by
0- HAV
1+ cytomegalovirus
2+ Toxoplasma gondii
3+ Listeria monocytogenes
4+ Treponema pallidum
5- Neisseria meningitidis
6- Hemophilus influenzae
7+ rubella virus
8- polioviruses
9+ HIV

6056To the agents of transplacental infections belong
0- rotaviruses
1- Treponema denticola
2+ VZV
3+ HBV, HCV
4- Streptococcus agalactiae
5+ HSV-1 and HSV-2
6+ Zika virus
7- rhinoviruses
8+ Borreliella burgdorferi
9- Pseudomonas aeruginosa

6057Intrauterine infection / risk of intrauterine infection - mark the correct pairs
0+ Listeria monocytogenes – raw meat products consumption during pregnancy
1- CMV – hydrops foetalis
2- rubella virus – saddle nose and screwdriver-shaped incisors
3+ Treponema pallidum – congenital syphilis
4+ Toxoplasma gondii – contact of pregnant woman with faeces of cat
5- HIV – microcephaly

6+ Zika-virus – mosquito-borne infection of pregnant woman
7- HCV – hydrocephalus and intracranial calcifications in newborn
8+ CMV – contact of pregnant woman with body fluids of infected children
9- morbilli – vaccination of pregnant woman with live attenuated MMR vaccine

6058Intrauterine infection threatens the foetus in the case of
0+ primoinfection of pregnant woman by cytomegalovirus
1- salmonellosis of pregnant woman
2+ systemic primoinfection of pregnant woman by transplacentally transmissible agent
3- detection of high-avidity IgG against toxoplasma in blood of pregnant woman
4+ detection of IgM and low-avidity IgG against toxoplasma in blood of pregnant woman
5+ application of MMR vaccine during pregnancy
6- vaccination of pregnant women against tetanus and diphtheria
7- detection of regain antibodies and negative PCR for Treponema pallidum
8+ positive RRR test and positive Western-blot for anti-treponemal antibody
9- adenoviral tonsillopharyngitis of pregnant woman

6059Transmission of infection from mother to foetus can be prevented by
0+ screening for transplacentally transmissible infections during pregnancy
1+ spiramycin administration to pregnant woman with acute toxoplasmosis
2- preventive isolation of pregnant woman without antibody against toxoplasma
3- tetracycline administration to pregnant woman diagnosed with syphilis
4- vaccination of pregnant woman with live attenuated vaccine against rubella
5+ avoiding of consumption of improperly washed vegetable by pregnant woman
6- acyclovir therapy of pregnant woman with primoinfection caused by CMV
7+ vaccination with MMR vaccine (during childhood of mother)
8+ penicillin administration to pregnant woman with syphilis during the first trimester
9+ antiretroviral therapy of HIV-positive pregnant woman

6060Prenatal microbiologic diagnostics of intrauterine infection
0+ starts with screening of pregnant women for transplacentally transmissible diseases
1- is performed only in the case of high-risk pregnancy
2- is based on antigen detection of the agent in urine of pregnant woman
3- is based on specific IgG detection in amniotic fluid
4+ is based on detection of microbial agent genome in amniotic fluid
5+ is based on direct detection of the agent in amniotic fluid
6- is based on direct detection of the agent in blood of pregnant woman
7- is not performed, because intrauterine infections cannot be detected
8- is performed routinely in all pregnant women
9+ should be performed only after detection of infection in pregnant woman

6061Postnatal diagnostics of intrauterine infection is based on
0+ specific IgM antibody detection in umbilical cord blood
1- specific IgM antibody detection in mother's blood
2- specific IgG antibody detection in umbilical cord blood
3- detection of specific IgG antibody decrease in the blood of baby three months after birth

4+ isolation of the agent from the blood of newborn
5- isolation of the agent from the blood of mother
6+ detection of nucleic acid of the agent in blood, urine or saliva of newborn
7+ detection of the agent by cultivation of pus, nasal swab or meconium or the newborn
8+ detection of the agent in lochia and placenta
9- detection of the agent in cervical and vaginal swab of mother

6062Mark the perinatally transmissible infectious agents
0+ Streptococcus agalactiae
1- Streptococcus mutans
2+ Neisseria gonorrhoeae
3- Neisseria sicca
4+ Chlamydia trachomatis
5- Chlamydia pneumoniae
6+ papillomaviruses
7- rubella virus
8+ HBV, HCV, HIV
9- UPEC

6063Perinatal infections - mark the correct pairs
0+ E. coli K1 - early-onset neonatal meningitis
1- coxackieviruses - early-onset neonatal meningitis
2+ Streptococcus agalactiae – meningitis of preterm neonates
3+ Listeria monocytogenes – transient vaginal and intestinal colonisation during pregnancy
4- infection of pregnant women by rotavirus – neonatal pneumonia
5+ vaginal colonisation of pregnant women by candida – oral candidiasis of neonate
6+ vaginal colonisation of pregnant women by S. aureus - omphalitis of newborn
7+ Chlamydia trachomatis D-K – perinatally transmitted neonatal pneumonia
8- adenovirus on vaginal mucosa – neonatal conjunctivitis
9- Clostridium botulinum on vaginal mucosa – neonatal diarrhoea

6064The following represents a risk for perinatal infection
0+ vaginal colonisation of pregnant woman by S. agalactiae and preterm birth
1- vaginal colonisation of pregnant woman by Lactobacillus and preterm birth
2+ cervical infection of woman in labour by Chlamydia trachomatis D-K
3- vaginal colonisation of woman in labour by Gardnerella
4+ herpetic genital lesions of woman in labour
5+ transient vaginal or intestinal colonisation of woman in labour by Listeria
6- intestinal colonisation of woman in labour by enterococci
7- toxoplasmosis of pregnant women
8+ syphilis of pregnant women
9- rubella of pregnant women

6065Diagnostics of perinatally transmissible infections is based on
0+ detection of the agent in liquor during early-onset neonatal meningitis
1- specific antibody detection during early onset neonatal septic pneumonia

2+ agent detection in cervical/vaginal swab of mother (confirmation of infectious source)
3- haemocultivation of mother's blood sample
4- haemocultivation of newborn's blood sample during neonatal oral candidiasis
5+ antigen and nucleic acid detection in blood and liquor during neonatal meningitis
6- detection of specific IgM in umbilical cord blood
7+ detection of infectious agent by culture of inflammatory exudate during omphalitis
8- detection of perinatally transmitted HIV, HCV and HBV by blood sample cultivation
9- antitetanic antibody detection during neonatal tetanus

6066The agent of perinatally transmitted neonatal meningitis is usually
0- Mycobacterium tuberculosis
1- enteropathogenic Escherichia coli
2+ Klebsiella pneumoniae
3+ Streptococcus pneumoniae
4+ Listeria monocytogenes
5- anaerobic non-sporulating bacteria
6- Cryptococcus neoformans
7- Staphylococcus aureus
8+ Streptococcus agalactiae
9+ E.coli K1

6067If the patient has painless genital ulcer with firm base
0+ the ulcer is most probably caused by Treponema pallidum
1+ the ulcer contains spirochaetes visible in dark-field microscopy
2- the ulcer is most probably caused by virus herpes simplex-2
3- the ulcerous lesion is not infectious
4+ if the patient is a pregnant woman, penicillin therapy should be immediately initiated
5- usually is treated by local application of antiseptics or antibiotics
6- if the ulcer spontaneously heals within 10 days, antibiotic treatment is not necessary
7+ the diagnosis is confirmed by anti-treponemal antibody detection
8- the ulcer contains bacterial agent cultivable on chocolate agar within 48-hours
9- the ulcer needs surgical debridement

6068The following diseases are sexually transmissible
0+ trichomoniasis
1+ hepatitis-B
2+ condyloma accuminatum
3+ chlamydial infections caused by C. trachomatis D-K
4- toxoplasmosis
5- varicella and zoster
6- legionellosis
7+ candidiasis
8- borreliosis
9- chlamydial infections caused by C. trachomatis A-C

6069Genital diseases of microbial origin

0- can arise only after sexual transmission of microbial agent
1+ can have also endogenous origin
2+ can lead to infertility
3- usually do not endanger the foetus and newborn
4- affect only promiscuous persons
5+ usually represent risk for sexual partners of the infected person
6- the majority of them are not preventable
7- usually do not cause serious complications
8+ can arise as a consequence of vaginal dysmicrobia
9- all can be treated by antibiotics

6070Uropoetic system and urinary tract infections
0+ microbial colonisation is limited to distal part of urethra
1+ urine in upper parts of urinary tract and in urinary bladder is physiologically sterile
2- midstream urine is always physiologically sterile
3- vesicoureteral reflux in childhood is physiological and need not to be monitored
4+ untreated cystitis may lead to ascending pyelonephritis
5+ bacteria can invade to the kidney also by haematogenous way through renal artery
6- pyelonephritis usually do not represent a source of sepsis
7- renal abscess is initiated exclusively after haematogenous kidney infection
8+ bacteria may during nephritis invade to blood through renal vein, leading to bacteraemia
9- urinary tract infections are more frequent in alcoholics

6071Urinary tract infections (UTI)
0+ improper emptying of urinary bladder due to prolapse increases the risk of UTI
1- neuromuscular diseases decrease the risk of UTI
2+ spermicides and frequent sexual intercourse may increase the risk of UTI
3- hematogenous renal infections are most frequently caused by G- bacteria
4+ Staphylococcus aureus is frequent agent of renal abscess
5+ catheterisation increases the risk of UTI
6- complicated UTI are more frequent in out-patients than in hospital
7+ risk of UTI increases during pregnancy (increased residual urine volume)
8- vaginal colonisation by urinary pathogens does not increases the risk of UTI
9- UTI usually develops after spreading of infection from intestine per continuitatem

6072Development of urinary bladder infection is supported by
0+ adhesion of urinary pathogens to urothelial cells
1- acidic pH of urine
2+ shorter female urethra
3- insufficient residual urine volume in urinary bladder
4+ obstruction of urine flow
5- alcoholism
6+ decompensated diabetes
7- colonisation of distal urethra by corynebacteriae
8+ prostatic hyperplasia
9+ decreases fluid intake

6073To the most frequent agents of urinary tract infections belong

0- Borreliella burgdorferi
1+ Escherichia coli
2- Clostridium perfringens
3+ Staphylococcus saprophyticus
4- Campylobacter coli
5- Actinomyces israelii
6+ Enterococcus faecalis and E. faecium
7+ Pseudomonas aeruginosa
8- Fusobacterium nucleatum
9+ Proteus mirabilis

6074Asymptomatic bacteriuria

0+ is a repeated symptomless significant bacteriuria
1- is repeated symptomless isolation of various bacteria in mixture from urine sample
2- is physiologic during pregnancy
3+ is more frequent in elderly people
4- always must be treated with antibiotics
5+ is a risk factor in diabetic patients
6+ represents dangerous infectious source during urologic operations
7+ is dangerous during cystoscopy and prostatectomy
8- is not dangerous during pregnancy
9- usually does not represent a source for ascending infection of kidney

6075Repeated urine bladder infections

0+ are more frequent in females
1+ may be the result of repeated ascending infection by intestinal G- rods
2+ may be the result of reactivation of persistent symptomless urothelium infection
3+ are more frequent in patients with indwelling urinary catheter
4- are more frequent in children and adolescents
5- more frequently arise during cranberry extract administration
6+ long-term antibiotic prophylaxis is used in prevention
7+ phage therapy may be effective in the treatment
8- are not associated with vaginal or intestinal colonisation by urinary tract pathogens
9- are not associated with urine stones

6076On persistent and recurrent cystitis participate

0+ reactivation of urinary pathogens persisting in urothelial cells
1+ biofilm production in urinary tract
2+ scarred and damaged mucosa of urinary bladder
3- instillation of hyaluronic acid to urinary bladder
4- administration of Uro-vaxom
5- overuse of urological tea
6+ foreign body in urinary tract
7+ incontinence

8- cystic fibrosis
9- overuse of antibiotics

6077Microbiological diagnostics of cystitis and pyelonephritis
0+ midstream urine sample is suitable for microbiological diagnostics
1- first portion of voided urine is suitable for microbiological diagnostics
2- urethral swab is collected to exclude contamination during urine collection
3- catheterised specimen of urine should always be preferred to midstream urine
4- urine of patient with indwelling catheter is collected from the drainage bag
5+ the request form should contain information about urine collection technique
6+ underlying diseases of patient may have impact on urine culture results interpretation
7+ urine after collection must be kept cold and transported to laboratory within 2 hours
8+ microscopic detection of leukocytes in urine support the diagnosis of urinary infection
9+ quantitative urine culture enables quantification of bacteriuria

6078The following results are clinically relevant in suspected non-complicated cystitis
0- bacteriuria of 100 to 1000 CFU/ml in midstream urine
1+ at least 100 000 CFU/ml in midstream urine
2- Candida in any amount in midstream urine
3+ any amounts of microorganisms in urine from suprapubic puncture
4+ erythrocytes and leukocytes in urine
5- more than 3 various bacterial species in midstream urine
6- massive presence of Candida in the first portion of voided urine
7+ UPEC in significant numbers in midstream urine
8- presence of lactobacilli and corynebacteria in midstream urine
9+ S. agalactiae in amount of 10 000 CFU/ml in midstream urine

6079Therapy and prevention of non-complicated cystitis (first episode) in out-patients
0- before therapy introduction it is always necessary to perform urine culture
1- antibiotics are administered only to patients with very high bacteriuria
2+ short course antibiotic treatment is preferred
3+ antibiotics with high urine concentration are used in therapy
4+ nitrofurans and fosfomycin can be used
5- excellent activity has peroral application of vancomycin and colistin
6+ beta-lactams, co-trimoxazole and quinolones may be effective
7- occurrence of polyresistant bacterial strains should be kept in mind during therapy
8+ prevention may be improved by counselling on intimate hygiene
9+ important is counselling on drinking regime

6080Therapy and prevention of chronic and recurrent urinary tract infections
0- treatment of immunocompetent adult patients is not necessary
1+ includes elimination of any anatomic or functional abnormalities of urinary tract
2+ immunomodulators of microbial origin can be used
3+ substances blocking the mannose-binding receptors of uropathogens may be used
4- macrolides and isoniazid may be effective
5+ fluoroquinolones and co-trimoxazole may be effective

6- treatment is usually empiric
7- surgical treatment is always necessary
8- therapy choice need not to be based on susceptibility tests results
9+ autovaccines (prepared from the patient's own strain) may be used in treatment

6081To risk factors for intestinal tract infection belong
0- increased acidity of stomach content
1+ hypochlorhydria or achlorhydria
2- vegetarian diet
3+ immunodeficiency
4+ intestinal dysbiosis
5+ intestinal motility disturbances
6+ therapy by broad-spectrum antibiotics
7- probiotics administration
8- intestinal colonisation by E. coli UPEC-strains
9+ consumption of improperly cooked eggs and meat

6082Diarrhoea can be caused by these bacteria
0+ Clostridium perfringens
1- Streptococcus pyogenes
2- Moraxella catarrhalis
3- Mycobacterium marinum
4+ Tropheryma whipplei
5+ Shigella spp.
6+ Escherichia coli (some strains)
7+ Yersinia enterocolitica
8- Mycoplasma hominis
9+ Campylobacter jejuni

6083Severe diarrhoea may be caused by
0+ Entamoeba histolytica
1- Naegleria fowleri
2+ Vibrio cholerae, type El Tor
3- Enterococcus faecalis
4+ Salmonella Enteritidis
5- polioviruses in non-vaccinated persons
6+ adenoviruses (mostly in children)
7- Enterobacter aerogenes
8- rotaviruses in adults
9+ EHEC

6084Invasion to the gastrointestinal tract mucosa is typical for the following microbes
0+ Cryptosporidium parvum
1+ Salmonella Typhi
2- Clostridium botulinum
3- Pseudomonas aeruginosa

4+ Mycobacterium bovis
5+ Microsporidia
6- Bacterioides fragilis
7+ Tropheryma whipplei
8- Giardia lamblia
9+ Entamoeba histolytica

6085The following bacteria are enteroinvasive
0- Staphylococcus aureus
1+ Campylobacter jejuni/coli
2+ Yersinia enterocolitica
3+ Shigella spp.
4- Bacillus cereus
5+ Salmonella Enteritidis
6+ E. coli (EIEC)
7- E.coli (ETEC)
8- Vibrio cholerae
9+ Arcobacter spp.

6086The following gastroenteritis agents can regularly cause considerable bacteremia
0- enteropathogenic Escherichia coli
1+ Salmonella Typhi
2- Salmonella Enteritidis
3- Shigella sonnei
4+ Campylobacter fetus
5- Campylobacter jejuni
6- Vibrio cholerae
7+ Vibrio vulnificus
8+ Salmonella Paratyphi
9- Clostridium botulinum

6087Sudden abrupt of diarrhoea and vomiting 5 hours after the meal
0+ can probably be caused by Bacillus cereus
1- can probably be caused by Clostridium difficile
2+ can probably be caused by Staphylococcus aureus
3- the patient probably suffers from bacillary dysentery
4- can probably be caused by Salmonella Typhi
5- can probably be caused by enterotoxigenic E. coli
6- can probably be caused by Clostridium botulinum
7+ cream-cake probably contained staphylococcal enterotoxins
8+ the re-heated rice probably contained emetic toxin of Bacillus cereus
9+ antibiotic therapy is not indicated

6088Enterotoxin-mediated diarrhoea
0+ can be caused by C. perfringens A (enterotoxin produced during sporulation in intestine)
1+ can be caused by Vibrio cholerae

2- patient suffering from cholera is not infectious for other people
3- staphylococcal enterotoxins are inactivated in food already by 1 minutes boiling
4- staphylococcal food poisoning is confirmed by S. aureus isolation from stool
5+ patient suffering from staphylococcal food poisoning is not infectious for other people
6- protective role have cytotoxic T-lymphocytes of the GALT
7+ specific antitoxic mucosal antibodies have protective role
8+ the basic therapy is rehydration of patient
9- antibiotic therapy is recommended in all cases

6089Enterocolitis caused by non-typhoid salmonellae and shigellae
0+ children have more severe clinical presentation (more severe dehydration)
1- the agents regularly invade to bloodstream with systemic antibody response
2- detection of nucleic acid of the agents in stool is not relevant for diagnostics
3+ microbiological diagnostics is based on detection of the agents in stool
4+ ATB should be applied only during severe course of disease
5+ pathogenesis is dominated by bacterial invasion to intestinal mucosa
6- non-typhoid salmonellae are mostly transmitted by contaminated water
7+ damaged large intestine mucosa is responsible for clinical symptoms of shigellosis
8- salmonellosis is characterised by infection of large intestine
9- non-toxigenic shigellae cannot cause diarrhoea

6090Post-antibiotic enterocolitis may be caused by
0+ Candida albicans
1+ Staphylococcus aureus
2- Streptococcus mutans
3- Bifidobacterium bifidum
4+ Clostridium difficile
5- Fusobacterium spp.
6- Salmonella enteritidis
7+ Proteus mirabilis
8+ Pseudomonas aerugiunosa
9- Lactobacillus spp.

6091Viral gastroenteritis
0+ typical agents are adenoviruses and noroviruses
1+ the most frequent agents in children are rotaviruses
2+ occurs most frequently in children and elderly people
3+ has epidemic spread
4- is not very contagious
5- in children is mild and does not cause dehydration
6- is recurrent due to virus persistence in lymph-nodes
7- direct microbiologic diagnostics is based on virus isolation from stool
8+ treatment is based on rehydration and diet
9- in children is treated by antibiotics

6092Botulisms

0- thermostable toxin is the principal virulence factor of Clostridium botulinum
1- botulinum toxin is antigenically uniform
2+ botulinum toxin causes paresis of both smooth and striated muscle
3- is caused exclusively by alimentary intoxication
4+ is treated by specific antiserum
5- in the case of food intoxication a prompt broad-spectrum ATB therapy is necessary
6+ botulinum toxin can be detected in food remnants
7+ botulinum toxin can be detected in the serum of patient
8- diagnostics is based on microscopic detection of the agent in food
9+ in children up to 1 year of age can arise after intestinal colonisation by C. botulinum

6093Microbiological diagnostics of diarrhoea
0+ for detection of viral and parasitic agents of diarrhoea stool samples must be collected
1- rectal swab is suitable for all microbiological diagnostic methods
2+ rapid microbiological diagnostics is based on antigen detection of the agents in stool
3+ microbiological diagnostics may be based on "diarrhoea" PCR test panels
4- after laboratory isolation of the agent, the antibiotic susceptibility is routinely detected
5- is based on routine microscopic examination of stool
6+ is based on culture of bacterial agents of diarrhoea
7+ is based on detection of C. difficile toxins in stool during post-antibiotic diarrhoea
8- is based on enterotoxins detection in rectal swab
9- is based on specific antibody detection in the blood of patient

6094Hepatitis-B
0- incubation time is 2-7 days
1+ incubation time is 1-6 months
2+ vaccination against HBV protects from hepatocellular carcinoma
3- incubation time is shorter after peroral way of virus entry
4- antibody against HBsAg confirms infectiousity of patient
5+ postinfectious and post-vaccination immunity is long-lasting
6- immunity is cross-reactive with hepatitis-A virus
7- HBV has primary cytopathic effect on hepatocyte
8+ HBV may persist long-lastingly in the body
9+ from patient with high viral load may be transmitted also by toothbrush

6095HCV
0+ belongs to RNA viruses
1- has more than 2000 various genotypes
2- the genotype 4 is the most frequent genotype in Slovakia
3- is transmitted similarly to HAV
4+ is transmitted similarly to HBV
5- superinfects cells infected by HBV
6- usually causes acute amd frequently fulminant hepatitis
7- 15% of people infected by HCV develop chronic hepatitis
8+ NS3/4A protease is a target for antiviral therapeutic agents
9+ quantification of viral load (viral RNA in blood) is used for treatment monitoring

6096HBsAg

0- is localised inside the Dane particles
1+ detection of HBsAg in serum confirms diagnosis of serum hepatitis (HB)
2+ detection of HBsAg in serum confirms infectiousity of patient
3+ HBsAg bound in immunocomplex participates on pathogenesis of chronic hepatitis-B
4- hypersensitivity of patient against HBsAg is detected by skin test
5+ protective antibody production against HBsAg can be stimulated by vaccination
6- presence of HBsAg in serum confirms viral hepatitis-A
7- is a core antigen of HBV
8- detection of HBsAg in serum reflects rapid replication of virus
9+ is a surface antigen of HBV

6097Hepatitis-C

0+ is transmitted parenterally
1- prevention is based on vaccination
2- is transmitted by fecal-oral way
3+ genotype 3 is the most frequent genotype among intravenous drug abusers
4+ RT-PCR is used both in diagnostics and in therapy monitoring
5+ antiviral therapy has almost 100% success rate
6+ occurs frequently in prisons
7+ if not treated, may lead to hepatocellular carcinoma
8- is almost totally eradicated
9- HCV nucleic acid detection is included in the obligatory screening of blood donors

6098Viral hepatitis - mark the correct pairs

0- acute HA - diagnosed by detection of specific IgG in serum
1+ acute HA - diagnosed by detection of specific IgM in serum
2+ HB - detection of HBsAg in serum during screening
3- HB - quantification of viral load in serum during screening
4+ HB - quantification of viral load in serum during therapy monitoring
5- HC - HCV Ag detection in blood during screening
6+ HC - specific antibody detection during screening
7+ HC - quantification of viral load in serum during therapy monitoring
8- HD - detection of HBsAg in stool during diagnostics
9+ HE - specific IgM and IgG antibody detection during diagnostics

6099Therapy of viral hepatitis - mark the correct pairs

0+ HA - symptomatic
1- HA - reverse transcriptase inhibitors
2+ HB - reverse transcriptase inhibitors and INF-alpha
3- HB - inhibitors of viral protease and ribavirin
4+ HC - inhibitors of viral protease and of NS5A protein
5- HC - IFN-alpha and DNA-polymerase inhibitors
6+ HE - symptomatic
7- HE - liver transplantation for hepatocellular carcinoma

8- HD - similar to hepatitis C (HDV is a satellite virus of HCV)
9+ HD - IFN-alpha (helps to supress the viral replication)

6100To the agents of nosocomial infections belong
0+ Staphylococcus aureus
1- Streptococcus salivarius
2- Corynebacterium diphtheriae
3+ Pseudomonas aeruginosa
4- Clostridium tetani
5- Clostridium botulinum
6+ Klebsiella pneumoniae
7- Listeria innocua
8+ Escherichia coli
9+ Enterococcus faecalis

6101Nosocomial infections (NI)
0+ catheterisation is important risk for NI of urinary tract
1+ corticosteroid therapy is important risk factor for surgical site infection
2- inappropriate hospital hygiene is the less important risk factor for surgical site infection
3- nosocomial pneumonia is the most frequent type of NI
4+ ventilator-associated pneumonia is caused by biofilm forming microbes
5- laboratory diagnostics of nosocomial infections is based on specific antibody detection
6+ C. difficile producing A and B toxins is the agent of post-antibiotic diarrhoea
7- therapy of NI caused by VRE is based on susceptibility of these strains to penicillin
8+ therapy of choice of NI caused by CPE is colistin
9- preventive screening of blood for transfusion detects VRE, CPE and ESBL

6102Immunodeficiency and infectious diseases
0+ patient with CNS toxoplasmosis has very probably insufficient cell-mediated immunity
1+ C5-C8 deficiency predispose to sepsis caused by encapsulated bacteria
2+ antibody deficiency has negative impact on opsonisation
3- chronic granulomatous diseases leads to insufficient opsonisation of microbes
4- viral infections are more frequent in persons with insufficient antibody production
5+ repeated mycotic infections draw attention to T-cellular deficiency
6- deficiency of sIgA is always clinically manifested by more frequent bacterial infections
7+ patient with repeated meningococcal meningitis is suspected of C5-C8 deficiency
8+ deficiency of complement component C3 increases the risk of pyogenic infections
9- insufficient activity of NK-cells has no impact on severity of viral infections

6103Secondary immunodeficiency (SI)
0+ may be a consequence of extensive skin and mucosal damage
1+ frequently is a result of transient immunosuppression
2+ may be a result of some serious infectious diseases
3- cannot be a result of splenectomy
4- is physiologic during adolescence
5- in non-treated patients with AIDS is only transient

6+ can be a result of drug abuse or malnutrition
7- broad-spectrum ATBs are preventively applied in all patients with SI
8+ may accompany metabolic disorders
9- smoking do not participate on decreased protection of lungs and periodontal tissue

6104Infectious diseases in immunosuppressed persons
0- are caused by the same spectrum of agents as in immunocompetent persons
1+ are frequently caused by opportunistic pathogens
2+ may frequently recur
3+ have tendency to generalisation
4+ frequently are caused by microscopic fungi
5- preferentially affect CNS
6- usually resolve on their own, without need of antimicrobial therapy
7- usually are caused only by primarily pathogenic microorganisms
8+ more frequently enter to persistent and chronic stage
9- in immunosuppressed patients stimulate long-lasting protective immunity

6105Immunodeficient patients
0+ may have infections caused by commensal microorganisms colonising skin and mucosa
1+ may have infections caused by saprophytic microbes with low virulence
2- always have typical clinical manifestations of infectious diseases
3- have repeated pyogenic infections due to T-cell-mediated immunity disorders
4- may have increased occurrence of food intoxications due to phagocytosis disorders
5+ have frequent reactivations of latent viral infections due to cellular immunity disorders
6+ have unpredictable results of vaccination
7- have unpredictable effect of treatment with anti-tetanus serum
8+ have more severe course of infectious diseases
9+ suffer more frequently from polymicrobial infections

61106Following opportunistic diseases are typical for patients with cellular immunity disorders
0+ mycobacterioses
1+ systemic and generalised aspergilloses
2- typhoid fever
3+ systemic candidiases
4+ legionnaires disease
5- meningococcal meningitis
6- streptococcal tonsillitis
7+ cryptococcal meningitis
8+ primary pneumocystis pneumonia
9- primary atypical bacterial pneumonia

6107People with decreased T-cellular immunity have
0- more frequent streptococcal tonsillitis
1- increased incidence of bacterial allergy
2+ more frequent viral diseases

3- repeated staphylococcal impetigo
4- increased risk of serious food intoxications
5+ increased risk of serious tissue parasitoses
6- decreased antitoxic immunity
7+ increased risk of systemic mycoses
8+ increased risk of latent virus reactivation
9+ increased risk of progressive multifocal leukoencephalopathy

6108The following is characteristic for antibody deficiency
0- increased risk of tuberculosis
1+ repeated purulent infections
2+ spectrum of infections similar to the phagocytosis deficiency
3- more frequent occurrence of rabies
4- increased risk of systemic mycoses
5+ secondary decrease of phagocyte function
6+ infections caused by extracellularly multiplying agents
7+ decreased antitoxic immunity
8- more frequent infections caused by herpetic viruses
9- chronic mucocutaneous candidiasis

6109Microbiological diagnostics of infectious diseases in immunocompromised patients
0+ is based on direct microbiologic diagnostics
1+ rapid microbiological diagnostic techniques are preferred
2- is based predominantly on specific antibody detection
3- TBC diagnostics in these patients is based on positive tuberculin skin test
4+ is connected with complicated interpretation of culture results
5+ is based on detection of infectious agent by quantitative PCR (real-time PCR)
6+ is based on monitoring of viral load in blood of these patients
7- qualitative detection of CMV genome in B-cells confirms CMV reactivation
8- absence of PMNLs in sputum sample excludes bacterial pneumonia in these patients
9- cultivation of biologic samples are preferred

6110Catheter-associated infections
0+ have usually endogenous origin
1- only rarely are caused by nosocomial bacterial strains
2+ most frequently are caused by microbes from neighbouring skin and mucosae
3- intravenous catheters are regularly colonised by Streptococcus mutans
4+ central venous catheter may be colonised by Candida
5+ catheter-related sepsis is most frequently caused by staphylococci
6+ microbial colonisation of urinary catheter is usually non-preventable
7- can be easily treated by antibiotics
8- usually are successfully treated by antibiotics only
9- treatment of catheter sepsis does not require catheter removal or change

6111Diagnostics and therapy of foreign-body-associated infections
0+ the colonised implat should be sent to the laboratory for examination

1- urinary catheter tip is a suitable sample for microbiologic examination
2+ central venous catheter tip is a suitable sample for microbiologic examination
3+ aspirate and biopsies from multiple places around implant should be sampled
4- cultivation of samples is always successful
5- MIC tests result with planktonic culture reliably predict the effect of antibiotic therapy
6+ is focused on detection of biofilm form of microbes in the sample
7- antibiotic therapy easily eradicates the infectious agents
8+ to eradicate the infectious agents, foreign body must usually be removed
9- molecular diagnostic methods (PCR, FISH) are in these cases not recommended

6112The following infectious diseases have oncogenic potential
0+ cervical papilloma
1- hepatitis-A
2+ hepatitis-B
3+ infection caused by EBV
4+ infection caused by HHV-8
5- legionellosis
6+ helicobacterial gastritis
7+ hepatitis-C
8- listeriosis
9- ehrlichiosis

6113To immunopathological diseases and syndromes triggered by infection belong
0+ rheumatic fever
1+ Guillain-Barré syndrome
2+ Stevens-Johnson syndrome
3+ acute glomerulonephritis
4+ reactive arthritis
5- septic arthritis
6- rheumatoid arthritis
7- cystic fibrosis
8- silicosis
9+ chorea minor

6114Antibodies contribute to pathogenesis of infectious diseases and their sequelae by
0+ cross reactivity among microbial antigens and antigens of human body
1+ production of immunocomplexes and their exposition in tissues
2+ complement activation on the surface of self-cells, labelled by antibodies
3- direction of phagocytes against bacteria that physiologically colonise GIT
4- activation of thrombocytes in the bloodstream
5+ cooperation on erythrocyte lysis in cold environment (cold agglutinins)
6- intravascular activation of coagulation pathway
7+ exposition of immunocomplexes in vascular endothelium
8+ exposition of immunocomplexes in kidney and postinfectious glomerulonephritis
9- granuloma formation around invaded microbes

6115The following agents are transmitted by unwashed hands

0+ agents of viral diarrhoea
1+ HAV and HEV
2- HBV, HCV and HDV
3+ coronaviruses and influenzavirus
4- arboviruses
5+ respiratory viruses
6- Vibrio cholerae
7+ Staphylococcus aureus and Streptococcus pyogenes
8- Treponema pallidum and Mycoplasma hominis
9+ Shigella and EHEC

6116The following diseases can be acquired by inhalation

0+ meningococcal meningitis
1- osteomyelitis
2+ variola
3+ diphtheria
4+ scarlet fever
5- erysipeloid
6+ pertussis
7- typhoid fever
8+ tularemia
9+ plague

6117To the arthropod-borne diseases belong

0+ epidemic typhus
1- herpetic encephalitis
2+ japan encephalitis
3+ relapsing fever
4- syphilis
5- AIDS
6+ malaria
7- listeriosis
8+ Q-fever
9- hepatitis-B

6118The following diseases are tick-borne

0- sleeping illness
1+ Lyme borreliosis
2+ ehrlichiosis
3+ tularemia
4- harvest fever
5- yellow fever
6- plague
7- anthrax
8- epidemic typhus

9+ babesiosis

6119Latent or chronic infection is frequently caused by
0- HAV
1+ Rickettsia prowazekii
2+ CMV
3- poliomyelitis virus
4+ HCV
5- rotavirus
6+ retroviruses
7+ VZV
8+ HBV
9+ Treponema pallidum

6120Measuring of antistreptolysin-O levels is used in the diagnostics of
0- erysipeloid
1+ sterile postinfectious sequelae of streptococcal infections
2+ poststreptococcal chorea minor
3+ rheumatic fever
4- diphtheria
5+ acute glomerulonephritis
6- staphylococcal enterocolitis
7+ poststreptococcal myocarditis
8- epidemic meningitis
9- streptococcal necrotising fasciitis

Imuno
7001Innate immunity
0+ recognises only a limited spectrum of conservative microbial structures
1+ acts immediately after invasion of the infectious agent to the body
2- recognises the specific antigens of microorganisms
3+ is activated by PAMPs
4- is activated by PAMPs presented through HLA-molecules
5- acts only in cooperation with adaptive immunity
6+ includes phagocytes, NK-cells, complement and the acute inflammatory response
7- has prolonged activity and immunologic memory
8+ is activated by bacterial endotoxins
9- is activated by bacterial exotoxins

7002To the humoral components of innate immunity belong
0+ interferons
1+ lysozyme and the other microbicidal peptides
2+ acute phase proteins
3- sIgA antibodies, naturally occurring on mucosal surfaces
4- cross-reacting IgM and IgG antibodies
5+ complement
6- IgA antibodies in serum

7- cytophilic antibodies on the surface of mastocytes
8+ coagulation factors (fibrinogen, von Willebrand factor)
9+ histamine and eicosanoids

7003To the cellular components of innate immunity belong
0- cytotoxic T-lymphocytes
1+ professional phagocytes
2- B-lymphocytes
3+ eosinophils
4- cells recognising antigens in association with HLA-molecules
5+ NK-cells
6- T-helper cells
7+ plasmacytoid dendritic cells
8- plasma cells
9+ PMNL

7004Macrophages (MFs)
0- are uniform population of immunocompetent cells
1- are short-living and cannot serve as reservoirs of infectious agents
2- have opsonin receptors, but does not have pattern recognition receptors
3+ are activated by cytokines (e.g. by IFN-gamma)
4+ can phagocytose and produce cytokines (IL-1, TNF) and complement components
5+ can present antigens to the helper T-lymphocytes
6+ activated MFs destroy intracellularly replicating listeriae, legionellae and mycobacteriae
7- are massively present in pus during acute bacterial infections
8+ belong to the key cells in pathogenesis of sepsis and septic shock
9+ can disseminate microbes from the site of entry throughout the body

7005Pathogen-Associated Molecular Patterns (PAMPs)
0+ are components of microorganisms
1+ are conservative and specific for large groups of microbes
2+ peptidoglycan, LPS, teichoic acid and flagellin belong to them
3- specific somatic, capsular and flagellar bacterial antigens belong to them
4- viral contact molecules belong to them
5- are recognised by mechanisms of adaptive immunity
6+ their recognition results in „microbial alarm“ activation
7+ the majority of them are recognised by various types pattern recognition receptors
8- they trigger development of immunological memory
9- they inhibit antibody production and activity of T-cytotoxic cells

7006Pattern Recognition Receptors (PRRs)
0+ immediately recognise the relevant pathogens
1+ recognise the principal conservative structures of microbes (the PAMPs)
2+ are components of innate immunity
3- are located on the surface of bacterial and viral particles
4- interact with specific microbial antigens
5+ bind glucans and mannans of microscopic fungi

6- bind bacterial superantigens
7+ recognise endogenous danger molecules released from damaged cells (DAMPs)
8+ after recognition of the corresponding PAMPs they activate transcription factors
9- after recognition of the corresponding PAMPs they initiate specific antibody production

7007Phagocytosis
0- is a function of all somatic cells of human body
1- is the exclusive ability of professional phagocytes
2- is a passive process, not requiring energy
3+ in macrophages and dendritic cells precedes the process of antigen presentation
4+ closely cooperates with antibodies and complement system
5- requires the activity of bacterial type 3 or type 4 secretion system
6+ is strongly supported by opsonisation
7+ phagosome fusion with lysosomes is necessary for digestion of engulfed microbe
8+ is not successful if microbes grow in biofilm form
9- has a key role in antiviral immunity

7008Microorganisms can evade inactivation in phagocytes by
0+ capsule production
1+ inhibition of phagosome fusion with lysosomes
2- inhibition of phagocyte apoptosis
3+ escaping to cytoplasm of phagocytes
4+ production of leukocidins
5- antibody binding through Fab fragments
6+ production of protein-A (S. aureus) and protein-M (S. pyogenes)
7- binding of C3b complement component
8- masking of microbial surface by CRP molecules
9+ production of toxins increasing cAMP in phagocytes

7009Complement system participates on
0+ rapid development of inflammatory response
1- destruction of non-enveloped viruses
2+ opsonisation, leukocytes chemotaxis and anaphylactoid reactions
3+ destruction of enveloped viruses
4+ poststreptococcal acute glomerulonephritis and rheumatic fever
5- antigen presentation
6+ reactive arthritis
7- immunocomplexes production
8+ inactivation of bacteria in bloodstream by membrane attack complex
9- neutralisation of bacterial toxins

7010Complement system may be activated
0+ immediately after recognition of some microbial components
1+ by antibodies of IgM class after their binding with antigen
2+ by antibodies of IgG class after their binding with antigen
3- after interaction of C1q complement component with bacterial surface mannose
4+ after interaction of mannose binding lectin with bacterial surface

5+ spontaneously (alternative pathway)
6- by class IgE antibody after binding with antigen
7+ during poststreptococcal immunopathogenic reactions
8- by inhibition of C5-convertase
9- by binding of C1-inhibitor on bacterial surface

7011Protective microbial antigen
0+ antibodies against such antigen protect from infectious disease
1- protects microbes from mechanisms of immunity
2- must have also a protein component
3+ can be used in vaccines
4+ is a component of binding parts of bacterial toxins
5- is specific, but not necessarily immunogenic
6+ is usually a component of microbial virulence factors
7- is protected from recognition by immune system
8+ is usually exposed on the microbial surface
9- if polysaccharidic, then cannot stimulate antibody production

7012Antigen presentation and immune response stimulation
0+ protein and polypeptide antigens stimulate immune response by T-dependent way
1- protein and polypeptide antigens are usually presented to T-cells in unprocessed form
2- T-dependent antigens are often polysaccharides that contain repeating epitopes
3+ T-dependent antigens require presentation with MHC class II molecules to T-helpers
4+ macrophages and dendritic cells are important antigen-presenting cells
5- to the principal antigen presenting cells belong T-helper cells
6+ T-independent antigens induce IgM synthesis without cooperation of T cells
7- polysaccharide antigens stimulate well immunological memory
8- B-lymphocytes cannot produce antibody against T-independent antigens
9+ humoral immune response to proteins is associated with isotype switching and memory

7013Antibodies I
0+ are produced by plasma cells
1+ with antigens form immunocomplexes
2- cannot react with self-antigens of the body
3+ cooperate with phagocytes during elimination of bacteria
4- cooperate with complement during lysis of G+ bacteria
5+ cooperate with eosinophils during inactivation of tissue warms
6+ neutralise viruses by binding to their contact molecules
7- penetrate across placenta only during intrauterine infections
8- excellently penetrate to biofilm
9+ are tested during indirect microbiologic diagnostics of infectious diseases

7014Antibody classes and their functions
0+ antibodies of the IgG class have opsonic activity
1- IgM antibodies are transplacentally transmitted to the bloodstream of foetus
2- IgA antibodies bind with high affinity to the surface of mastocytes
3- IgD serves as antigen receptor on the B-lymphocyte surface

4+ IgE antibody mediate mastocyte degranulation after interaction with antigen
5+ IgM class has the highest agglutination activity
6- K-cells interact only with antibodies of IgA class
7+ IgG and IgM antibody classes activate complement by classical pathway
8+ secretory antibodies of the class IgA block microbial adhesion to the mucosa
9- IgE and IgA antibodies stimulate the lectin pathway of complement activation

7015Antibody (Ab) production
0- after antigenic stimulus, antibody of IgG class is produced as the first
1+ T-dependent antigens induce production of all classes of antibody
2- antibody production phase lasts usually 7 - 10 days
3- repeated application of T-independent Ag shorten the induction phase of Ab production
4- during reactivation of infectious disease only antibodies of IgG class are produced
5- IgG avidity in the course of immune response remains unchanged
6+ induction phase of primary antibody response lasts approximately 7-10 days
7+ induction phase of secondary antibody response is shorter thanks to the memory cells
8+ polysaccharidic antigens trigger IgG-2 antibody production
9+ protein antigens trigger IgG-1 antibody production

7016To the non-specific protective mechanisms of mucosae belong
0+ mucociliary motility
1+ peristaltic movement of gastrointestinal tract
2+ mucin layer production on mucosal surfaces
3+ activity of lysozyme, complement and PMNLs
4- activity of sIgA class antibodies
5- submucosal lymphoid tissue activity
6+ regular mucosal epithelial cells turnover
7+ degranulation of eosinophils, basophils and mastocytes
8- function of B-lymphocytes, cytotoxic and helper T-lymphocytes
9- opsonisation by antibodies and immunocomplex formation

7017Autoimmune diseases
0+ are result of type II, III or IV hypersensitivity reactions
1+ arise after activation of adaptive immunity
2- arise after activation of mastocytes by microbial antigens
3- are result of aberrant activation of innate (non-specific) immunity
4- are not genetically predisposed
5+ can be triggered by some bacterial and viral infections
6+ poststreptococcal rheumatic fever belongs to them
7- haemolytic-uremic syndrome during shigellosis belongs to them
8+ post-campylobacter or post-mycoplasmal Guillain-Barré syndrome belong to them
9- neurodegenerative prion diseases belong to them

7018Mark the correct pairs
0+ Yersinia enterocolitica – reactive arthritis
1- Staphylococcus aureus - rheumatic fever
2+ Mycoplasma pneumoniae – Stevens-Johnson syndrome

3+ Campylobacter jejuni and Mycoplasma pneumoniae - Guillain-Barré syndrome
4+ Streptococcus pyogenes – postinfectious glomerulonephritis
5- Neisseria meningitidis – sclerosis multiplex
6- Pseudomonas aeruginosa – postinfectious polyradiculoneuritis
7- Staphylococcus aureus – reactive arthritis in children
8- Streptococcus agalactiae - postinfectious glomerulonephritis
9+ influenza virus A – postinfectious encephalomyelitis

7019The following play important role in defence against intracellular bacteria
0+ activated macrophage, reactive oxygen and nitrogen species
1+ granuloma formation
2+ Th1 cytokine response
3- Th2 cytokine response
4- complement
5- phagocytosis (PMNL)
6+ NK-cells and IFN-gamma
7- IgE and eosinophils
8+ cytotoxic T-lymphocytes
9- Th9 cytokine response

7020The following play important role in defence against intestinal parasitic worms
0+ IgE and mastocytes
1+ Th2 cytokine response
2- complement activated by alternative pathway
3- PMNL
4- lysozyme
5+ mucin production by intestinal mucosa
6+ intestinal peristalsis
7- IFN-beta
8- antitoxic antibody
9+ Th9 cytokine response

7021The following play important role in defence against microscopic fungi
0+ activated PMNLs and macrophages
1- non-activated macrophages
2+ Th-17 cytokine response
3+ reactive oxygen and nitrogen species
4- lysis by complement
5+ dectines and galectin-3 on surface of macrophages, mucosal epithelium and dendritic cells
6- preferentially the antibody response
7- lysozyme
8+ beta-defensins
9- Th-2 cytokine response

7022The following play important role in defence against parasitic protozoa
0+ antibody response in giardiasis

1+ activated macrophage in toxoplasmosis
2- antitoxic antibody in toxoplasmosis
3- serum lysozyme in malaria
4+ Th1 cytokine response in malaria
5+ cell-mediated immunity in toxoplasmosis
6- parasite inactivation by Tc-lymphocytes in amoebic dysentery
7- mastocytes and IgE in malaria
8+ macrophage activation and NO production in trichomoniasis
9- serum antibody during hepatic phase of malaria

7023The following play important role in defence against viruses
0+ sIgA against respiratory viruses
1+ interferons
2+ cytotoxic NK-cells and cytotoxic T-lymphocytes
3+ circulating antibodies (in phase of viremia)
4- Th-2 cytokine profile in supporting of cell-mediated immunity
5+ complement system (against enveloped viruses)
6- lysozyme
7+ plasmacytoid dendritic cells
8- lysis of non-enveloped viruses by complement
9- antibody of IgE class

7024On the protection against infections of urinary tract participate
0+ cleansing activity of the regular urine flow
1- mucociliary epithelium
2+ sIgA and complement
3+ PMNLs, macrophages and NK-cells
4+ chemokines and cytokines produced by urothelium stimulated through PRR
5- normal (healthy) microbiota of urinary bladder and kidney
6- urinary retention
7+ microbicidal peptides produced by urothelium
8+ barrier function, regulated exfoliation and regeneration of urothelium
9- urinary bladder catheterisation

7025On the protection against infections of female genital system participate
0+ normal (healthy) vaginal microbiota
1- alkaline vaginal secretion
2+ acidic vaginal environment
3- physiologic reflexes
4+ cervical mucus plug (protection of uterus and foetus)
5+ PMNLs and mucosal antibody
6+ PRR and beta-defensins
7- metabolic products of Gardnerella vaginalis
8+ metabolic products of lactobacilli
9- metabolic products of Candida

7026Inactivated vaccines

0+ usually stimulate only antibody response
1+ are usually less active in comparison with attenuated vaccines
2+ can be applied to pregnant women
3+ do not harm people with cell-mediated immunodeficiency
4- are given in a single dose
5+ stimulate mostly only IgG antibody production
6+ require addition of adjuvant
7- polysaccharide and toxoid vaccines do not belong to inactivated vaccines
8- have higher immunogenicity if applied perorally
9- can cause typical clinical presentation of disease in children

7027Conjugated vaccines
0+ belong to subunit vaccines
1- contain protective antigens which are bound to a viral vector
2+ contain bacterial polysaccharide antigens bound to a protein carrier
3- contain live attenuated vaccine strain bound to a polysaccharide carrier
4- contain genes coding for the protective antigen of the infectious agent
5+ enable to recognise polysaccharide epitopes by T-dependent way
6+ are more effective than non-conjugated polysaccharide vaccine
7- are more effective than common attenuated vaccines
8+ are intended especially for vaccination of children
9+ are used in prevention of some bacterial meningitis and pneumonia

7028Living microorganisms with low virulence are contained in the following vaccines
0- toxoid vaccine
1+ attenuated vaccine
2- subunit vaccine
3+ vaccine against tuberculosis (BCG)
4+ vaccine against morbilli, mumps and rubella (MMR)
5- vaccine against diphtheria, tetanus and pertussis (DiTePer)
6- vaccine against hepatitis-B and tick-borne encephalitis
7+ vaccine against varicella, yellow fever and japan encephalitis
8- vaccine against papillomaviral infection
9+ vaccine against rotaviral infection (Rotarix)

7029Prevention of tetanus by vaccination is based on
0+ production of specific antibodies inactivating the tetanospasmin
1- induction of specific cell-mediated immunity
2- production of antibodies opsonising Clostridium tetani
3- production of antibodies inactivating tetanolysin
4+ production of specific antitoxic IgG antibodies
5+ application of three doses of antitetanic vaccine during the first year of life
6- stimulation of immune response blocking Clostridium tetani germination in wound
7+ induction of long-lasting antitoxic immunity
8- induction of sIgA antibodies by tetanic antitoxin
9+ booster dose of tetanic toxoid vaccine to adults every 15 years

7030Vaccination scheme in Slovak Republic includes vaccination against

0+ poliomyelitis
1- rotaviral diarrhoea
2+ hepatitis-B
3+ morbilli
4+ rubella
5+ viral parotitis
6- hepatitis-A
7- influenza
8- tick-borne encephalitis
9- varicella

7031Mark the correct pairs (vaccine – its usage)

0+ vaccine against tetanus and diphtheria – regular vaccination of children and adults
1- vaccine against tic-borne encephalitis – regular vaccination of children and adults
2+ vaccine against yellow fever – obligatory vaccination in endemic areas
3+ vaccine against HBV and papillomaviruses – prevention of cancer
4- vaccine against hepatitis-C – optional vaccination of children
5+ vaccine against HIV, malaria and HCV – our sincere wish
6+ vaccine against pneumococci – vaccination of children and elderly people
7+ vaccine against rotaviruses – optional vaccination of small children
8- vaccine against mumps, morbilli and rubella – vaccination of pregnant women
9- vaccine against rabies – regular vaccination of aggressive people

7032Immunomodulators of microbial origin

0+ contain molecules stimulating the immunity through PRRs
1+ include commercial preparations and autovaccines
2+ they activate mechanisms of innate immunity and support the adaptive immunity
3+ are applied perorally or locally to the respiratory mucosa
4- can stimulate immunity only on the mucosa to which they were applied
5+ should be applied regularly, long-lastingly and repeatedly
6- can be applied to all patients, without respect to the opinion of immunologist
7- cannot be applied in combination with antibiotics
8+ are used in the treatment and prevention of repeated and chronic infections
9- cannot be applied in patients with asthma, COPD and persistent rhinosinusitis

7033Autovaccines

0+ contain inactivated microbial strain from the patient's infectious focus
1+ are prepared individually for a particular patient
2- are very expensive and difficult to prepare
3- before autovaccine application there is no need for any previous patient evaluation
4+ they are usually applied in peroral form
5- repeated autovaccine application may trigger emergence of resistance
6+ autovaccines can help in the therapy of recalcitrant skin infections
7+ autovaccines can help in the therapy of infections caused by polyresistant bacterial strains
8+ autovaccines can treat chronic and recurrent respiratory and urogenital infections

9- autovaccines can destroy the balance of human mucosal microbiota

7034To the typical therapeutic immunomodulators of microbial origin belong
0+ Uro-vaxom (for chronic and repeated urinary tract infections)
1- therapeutic phage cocktails
2- vaccines against the childhood viral diseases
3+ Imudon (for treatment of infections in oral cavity and respiratory tract)
4+ personalised autovaccines
5+ Broncho-vaxom (for chronic and repeated respiratory tract infections)
6- prebiotics, probiotics and synbiotics
7+ microbial antigens for hyposensibilisation
8- toxoid vaccines against tetanus and diphtheria
9- capsular subunit vaccines against pneumococci and meningococci

7035Passive immunisation (specific antibody application) must be applied during
0+ tetanus
1+ diphtheria
2+ botulism
3+ rabies
4- neonatal sepsis
5- severe influenza
6- bacterial meningitis
7- cholera
8- cerebral malaria
9- invasive candidiasis

Antibiotics

8001Penicillin antibiotics
0+ are not active against L-forms of bacteria, mycoplasmas and rickettsiae
1- interfere with bacterial cytoplasmic membrane synthesis
2+ act only on growing and multiplying bacterial cells
3- are primarily bacteriostatic
4+ disturb cross-links formation in peptidoglycan of bacterial cell wall
5- can be administered to any patient
6+ are non-toxic, suitable also for children and pregnant women
7- in chlamydiae can induce L-forms production
8+ can be combined with inhibitors of beta-lactamases
9- act against agents of atypical pneumonia

8002The following bacteria are regularly susceptible to penicillin
0- Morganella morganii
1- Pseudomonas aeruginosa
2+ Streptococcus pyogenes
3- Enterococcus spp.
4+ Treponema pallidum
5+ Leptospira interrogans
6- Streptococcus pneumoniae

7+ Actinomyces spp.
8- Neisseria gonorrhoeae
9- Ureaplasma urealyticum

8003Slow-release forms of penicillin-G are used in
0- treatment of recurrent meningitis
1+ prevention of new attack of rheumatic fever
2- eradication of Staphylococcus aureus carriage
3+ secondary prevention of acute poststreptococcal glomerulonephritis
4- people in frequent contact with Bacillus anthracis (preventive usage)
5- persons in repeated contact with Neisseria gonorrhoeae (post-exposition)
6+ therapy of syphilis
7- therapy of patients with haemoculture yielding MRSA strain
8- persons colonised by Pseudomonas aeruginosa
9+ patients who need long-lasting maintenance of effective penicillin levels in body

8004Cephalosporins
0+ belong to beta-lactam antibiotics
1- primarily are non-active against staphylococci and acinetobacters

2+ inhibit bacterial cell wall synthesis only in growing bacteria
3- act exclusively on Gram-positive bacteria
4- none of cephalosporins is active against anaerobic bacteria
5- cause damage to bacterial cytoplasmic membrane
6- all cephalosporins can be administered perorally
7+ patient allergic to penicillin may have cross-allergy to cephalosporins as well
8+ some of them act also against Pseudomonas species
9- are used in the treatment of listerial infections

8005Mark beta-lactamase inhibitor combinations used in medical practice
0+ amoxicillin with clavulanic acid
1- vancomycin with avibactam
2+ cefoperazone with sulbactam
3- penicillin with clavulanic acid
4+ meropenem with vaborbactam
5- aztreonam with tazobactam
6+ ceftazidime with avibactam
7+ ceftolozane with tazobactam
8- oxacillin with avibactam
9- imipenem with clavulanic acid

8006To glycopeptide antibiotics belong
0+ oritavancin
1+ dalbavancin
2+ telavancin
3- penicillin
4- linezolid
5- bacitracin
6- ethambutol
7- meropenem
8+ vancomycin
9+ teicoplanin

8007Aminoglycosides
0+ act after binding to bacterial ribosomes
1- are bacteriostatic even at high concentrations
2+ have ototoxic and nephrotoxic side effects
3+ the majority of aminoglycosides are not absorbed from GIT
4- are not excreted in active form
5- bacteria are not able to inactivate these antibiotics
6+ their toxic effect can cumulate after repeated administration
7- damage the bacterial cytoplasmic membrane
8+ some of them are active against mycobacteria
9+ irreversibly inhibit protein synthesis in bacterial cell

8008Chloramphenicol
0+ reversibly inhibits protein synthesis on bacterial ribosomes

1+ is a broad spectrum antibiotic
2- is frequently used in therapy of infectious diseases
3- is almost not absorbed after peroral administration
4- poorly penetrates to the CNS and liquor
5+ can cause "gray baby" syndrome after application to neonates
6+ may have toxic effect on haematopoiesis (inhibits erythropoiesis)
7+ may damage the function of mitochondriae
8- is preventively administered to patients with chronic respiratory tract diseases
9- resistance to chloramphenicol is rather high

8009Tetracyclines
0- are primarily bactericidal
1- their spectrum includes only Gram-negative bacteria
2- act well against Pseudomonas aeruginosa
3+ reversibly damage translation of genetic information in bacterial cell
4+ are well absorbed from GIT
5- poorly penetrate into eucaryotic cells and body fluids
6+ are deposited into growing bones and teeth
7+ are neither neurotoxic nor nephrotoxic
8- due to their high toxicity are used only for local therapy
9+ destroy intestinal microbiota and cause dysbiosis

8010Macrolides
0+ act against Gram-positive and some Gram-negative bacteria
1+ they are primarily bacteriostatic
2- inhibit transcription in microbial cells
3+ have excellent intracellular penetration
4- damage the permeability of bacterial cytoplasmic membrane
5+ some are used in treatment of infections caused by mycobacteria
6- are not active against anaerobic bacteria
7- azithromycin in higher concentrations is used in treatment of systemic mycoses
8+ bind to 50S ribosomal subunit of bacteria and inhibit protein synthesis
9- are not active against mycoplasmae, legionellae and chlamydiae

8011Lincosamides (clindamycin)
0+ act against Gram-positive bacteria
1+ can damage intestinal microbiota
2- are active against Clostridium difficile
3- inhibit peptidoglycan synthesis
4+ excellently penetrate to bone tissue
5+ inhibit bacterial protein synthesis
6- are not active against L-forms of bacteria
7+ act against non-sporulating anaerobic bacteria
8+ are used also in topical application forms
9- act only against bacteria

8012Fluoroquinolones (FQ)

0- inhibit bacterial cell wall synthesis
1+ interfere with DNA-gyrase
2- have bacteriostatic effect
3- are active only against Gram-positive bacteria
4- are active only against Gram-negative bacteria and mycobacteria
5+ are concentrated in active form in urine
6+ potentially damage cartilage development
7+ cannot be administered to pregnant women
8- bacterial resistance to FQ is very rare
9+ to second generation FQs belong ciprofloxacin, ofloxacin and norfloxacin

8013Polymyxin antibiotics
0+ are bactericidal
1- act only against growing and metabolically active bacteria
2+ are not absorbed from intestinal tract
3+ are nephrotoxic
4+ are used mostly locally
5+ damage permeability of the outer membrane of G- bacteria
6- their spectrum includes G+ bacteria
7- bactericidal activity has only colistin; polymyxin-B is only bacteriostatic
8+ are drugs of last resort in treatment of infections caused by polyresistant G- bacteria
9- cannot be applied intravenously

8014Antibiotics affecting the function or integrity of bacterial cytoplasmic membrane
0- act only against metabolically active bacteria
1+ daptomycin is a reserve drug for polyresistant G+ bacteria
2+ daptomycin does not penetrate through outer membrane of G- bacteria
3- daptomycin damages the outer membrane of G- bacteria
4+ pyrazinamide acts against non-active persistent mycobacterial cells
5- pyrazinamide damages in mycobacteria only the ATP production
6- pretomanid and bedaquiline are new first-line antituberculotics
7+ pretomanid decreases ATP production in hypoxic environment
8+ bedaquiline inhibits ATP-synthase in dormant mycobacteria
9- they mostly have only bacteriostatic activity

8015Sulphonamides
0+ inhibit endogenous synthesis of purines
1+ competitively inhibit dihydropteroate synthase
2+ are the drug of choice in the therapy of nocardiosis
3+ have synergistic bactericidal activity with trimethoprim
4- have the same target enzyme in bacterial cell as trimethoprim has
5- in high dose can damage the cytoplasmic membrane permeability
6- must not be used with folic acid
7+ are structural analogues of para-amino-benzoic acid
8- are not active against G- bacteria and mycobacteria
9- act only against bacteria

8016Trimethoprim
0+ inhibits dihydrofolate synthase

1- has narrow spectrum of activity
2+ is bactericidal in combination with sulfamethoxazole (co-trimoxazole)
3+ in monotherapy has only bacteriostatic activity
4- inhibits protein synthesis
5- can be applied only locally
6+ combined with sulfamethoxazole is a drug of choice for pneumocystis pneumonia
7+ is a structural analogue of dihydrofolic acid
8- does not concentrate in urine and is not active against urinary pathogens
9- is active also against Pseudomonas aeruginosa and Enterococcus spp.

8017Rifampicin
0+ is a broad spectrum bactericidal drug
1+ inhibits bacterial RNA-polymerase
2- inhibits replication of bacterial DNA
3+ is active also against bacteria with low metabolic activity
4- does not have good intracellular penetration
5+ is active against mycobacteria
6- is used for therapy of acute cystitis
7- is used for therapy of bacterial vaginosis
8+ is used for therapy of biofilm-associated infections
9+ application of rifampicin in monotherapy is not recommended

8018Mark the drugs active against mycobacteria
0- para-aminobenzoic acid
1- metronidazole
2+ streptomycin
3+ fluoroquinolones
4+ rifampicin
5+ ethionamide
6- oxacillin
7- lincomycin
8+ para-aminosalicylic acid
9+ azithromycin

8019Antituberculotics and therapy of tuberculosis (TBC)
0- treatment of primary TBC is based on monotherapy
1- mycobacteria never develop resistance against isoniazid
2+ activity of antituberculosis drugs can be checked by in vitro tests
3+ antituberculosis drugs are administered exclusively in combination therapy
4- sulfamethoxidine is used in local therapy of cutaneous tuberculosis
5+ therapy of TBC must always be prolonged (lasts several months)
6- metronidazole is used in the therapy of CNS tuberculosis
7- in treatment of renal TBC are used nitorfurans combined with streptomycin
8+ cycloserine belongs to second-line antituberculotics
9+ pyrazinamide inhibits energy metabolism of mycobacteria

8020The following drugs may be active against Pseudomonas aeruginosa
0+ amikacin
1+ meropenem
2- ampicillin with sulbactam
3+ cefoperazone with sulbactam
4- ertapenem
5+ piperacillin with tazobactam
6- bacitracin
7+ ciprofloxacin
8- daptomycin
9- tetracycline

8021Methicillin susceptible Staphylococcus aureus strains are usually susceptible also to
0- aztreonam
1- penicillin
2+ vancomycin
3+ oxacillin
4+ amoxicillin with clavulanic acid
5- ampicillin
6- colistin
7+ cefalotin
8+ linezolid
9- metronidazole

8022The following drugs may be applied locally
0+ erythromycin
1+ ofloxacin
2- ertapenem
3- ethambutol
4+ fusidic acid
5+ gentamicin
6- amoxycillin
7- cefuroxime
8+ clindamycin
9- penicillin

8023To the antibacterial drugs with exclusively local application belong

0+ mupirocin
1+ neomycin
2- nystatin
3- cefotaxime
4- linezolid
5+ bacitracin
6+ polymyxin-B
7- clindamycin
8- tetracycline
9- chloramphenicol

8024The antimicrobial panel tested in patients with urinary tract infections contain
0- polymyxin-B
1+ co-trimoxazole
2+ fosfomycin
3- bacitracin
4+ nitrofurantoin
5- macrolides
6- clindamycin
7- neomycin
8+ fluoroquinolones
9+ aminopenicillins and their combinations

8025Antimicrobial drugs are combined in the therapy in order to achieve
0+ synergistic activity of ATB drugs in combination
1- antagonistic activity of ATB drugs in combination
2+ successful treatment of mixed infections
3+ reduction of antimicrobial resistance emergence during prolonged therapy
4- increased antitoxic activity of ATB combination
5+ reduction of ATB toxicity by decrease of ATBs dose in synergistic combination
6+ extension of activity spectrum during therapy
7- decreased likelihood of allergic complications
8+ reduction of the risk of resistant mutants selection during prolonged therapy
9- decreased risk of damage to the microbiota equilibrium

8026The following antimicrobial drug combinations are used in therapy
0- cefalotin and cefazolin (decreased risk of allergic reaction)
1+ trimethoprim and sulfamethoxazole (synergistic bactericidal effect, broader spectrum)
2+ aminopenicillin and ceftriaxone (cidal effect on enterococci during endocarditis therapy)
3+ neomycin and bacitracin (broader spectrum of activity)
4+ rifampicin and some other active ATB (prevention of resistant mutants selection)
5- teicoplanin and vancomycin (synergistic bactericidal effect on VRE)
6- clarithromycin and roxithromycin (broader spectrum of activity)
7+ beta-lactam antibiotics with aminoglycosides (synergistic bactericidal activity)
8- tetracycline with penicillin (decreased toxic side-effect)
9+ beta-lactams and inhibitors of beta-lactamases (restoration of beta-lactam activity)

8027Antibiotics may have the following negative side-effects
0+ allergic reaction

1+ damaged equilibrium of microbiota (dysbiosis)
2+ hypovitaminosis-K
3- hypovitaminosis-D
4+ nephro- and neurotoxic effect (aminoglycosides)
5+ massive endotoxin release from G- bacteria during sepsis
6- activation of latent toxoplasmosis during spiramycin application
7+ cartilage disorders in foetus and children caused by fluoroquinolones

8- activation of biofilm production by bactericidal concentrations of antibiotics
9+ selection of resistant mutants

8028To the side-effects of antibiotics belong
0- overmultiplication of lactobacilli and bifidobacteria in intestine
1+ deafness after gentamicin and streptomycin therapy
2+ disorders in bone and teeth development after tetracycline application to children
3- reactivation of herpetic viruses
4- teratogenic effect of penicillin
5- cartilage damage by macrolides
6+ pseudomembranous enterocolitis (overmultiplication of Clostridium difficile)
7+ mycotic infections of mucosal membranes
8- selection of highly virulent forms of microorganisms
9+ kidney damage during improper application od colistin

8029To the side-effects of tetracyclines belong
0- eye disorders
1- hearing defects
2+ enamel disorders
3+ bone development disorders in foetus and children
4+ damaged equilibrium of intestinal microbiota
5- severe defects of protein synthesis in somatic cells
6- damaged hair growth
7+ teratogenic effect if applied during pregnancy
8+ dyspepsia due to dysbiosis
9- nephrotoxicity

8030Antimicrobial resistance (resistance against anti-infectious drugs)
0+ it means, that the microorganism is not affected by antibiotic
1- in the case of penicillins, resistance of L-forms of bacteria is genetically fixed
2- is a transient physiologic state of bacteria, not fixed genetically
3+ can be caused by modified antibiotic target site
4- intrinsic (natural) resistance emergence is triggered by contact with ATBs
5+ cross-resistance may affect antibiotics with similar chemical structure
6+ cross-resistance may affect antibiotics with the same bacterial target site
7+ can be caused by efflux of antibiotic from the bacteria cell
8- cannot emerge during the therapy of patient
9+ can be caused by bacterial enzymes inactivating the antibiotics

8031The following drugs are used for therapy of infections caused by yeasts
0- co-trimoxazole
1+ fluconazole
2+ echinocandins
3+ nystatin
4- novobiocin
5- nalidixic acid
6+ miconazole
7+ amphotericin-B
8+ ketoconazole

9- metronidazole

8032Toxoplasmosis treatment is based on application of
0+ co-trimoxazole
1+ spiramycin (prevents foetal damage during primoinfection of the pregnant woman)
2- mebendazole
3- ciprofloxacin (prevents foetal damage during primoinfection of the pregnant woman)
4- metronidazole (in toxoplasmosis of CNS)
5- pentamidine (in pulmonary toxoplasmosis)
6+ sulfadiazine
7+ pyrimethamine (acts directly against parasite)
8- HAART (acts directly against parasite)
9- non-nucleotide inhibitor of reverse transcriptase (acts directly against parasite)

8033Antiviral chemotherapeutics
0+ acyclovir inhibits DNA-polymerase of several herpetic viruses
1+ oseltamivir interferes with release of influenzavirus from infected cells
2+ azidothymidine blocks reverse transcriptase of HIV-1
3- raltegravir acts on both HIV and HBV
4+ enfuvirtide blocks entry of HIV to the cell
5- vidarabine blocks penetration of viruses to the cells
6+ remdesivir inhibits RNA-dependent RNA-polymerase of several RNA viruses
7- acyclovir is active also against cytomegalovirus
8+ ribavirin acts only against RNA-viruses
9- foscarnet is less toxic than acyclovir

8034To anti-influenza drugs belong
0+ amantadine
1- acyclovir
2+ rimantadine
3- interferon alpha
4- azidothymidine
5- azithromycin
6- aztreonam
7+ zanamivir
8+ oseltamivir
9- vidarabine

8035To antiretroviral drugs (for treatment of HIV infections) belong
0+ raltegravir
1- acyclovir
2- cidofovir
3+ atazanavir
4+ lamivudine

5+ enfuvirtide
6+ ritonavir
7- ledipasvir
8+ emtricitabine
9- ribavirin

8036Interferon-based therapy of hepatitis-C was currently replaced by
0+ sofosbuvir
1- ribavirin
2- ribavirin and peroral interferon
3- lamivudine/stavudine/zidovudin
4+ glecaprevir/pibrentasvir
5- emtricitabine
6+ ombitasvir/paritaprevir/ritonavir
7+ sofosbuvir/velpatasvir/voxilaprevir
8- lopinavir
9- ritonavir

8037Spectrum of anti-infectious drugs - mark the correct options
0- tigecycline can be active against Pseudomonas aeruginosa
1+ quinupristin with dalfopristin can be active on vancomycin-resistant Enterococcus faecium
2+ linezolid can be effective against staphylococci (including MRSA)
3- imipenem is effective against carbapenemase-producing klebsiellae
4- daptomycin may inactivate Pseudomonas aeruginosa strains
5- fidaxomicin is not active against Clostridium difficile
6+ linezolid is active against streptococci
7- oseltamivir inhibits replication of herpetic viruses
8+ brivudin is effective against varicella-zoster virus
9+ ombitasvir acts against hepatitis-C virus

8038Mark the correct choice of empiric antimicrobial therapy
0- ampicillin against Pseudomonas aeruginosa
1- cefuroxime against enterococci
2- amoxycillin with clavulanic acid against MRSA j

3+ amoxycillin with clavulanic acid against MSSA
4- vancomycin against salmonellae
5+ linezolid against mecA gene positive Staphylococcus
6+ penicillin against Streptococcus pyogenes
7+ pyrazinamide against Mycobacterium tuberculosis
8- zanamivir against HIV
9+ raltegravir against HIV

8039Rational anti-infectious therapy
0+ antibiotics are applied for long enough time, even after improvement of the clinical state
1+ broad spectrum ATBs should be used if the agent of severe disease is not yet known
2+ bactericidal drugs should be preferred in the treatment of severe infectious diseases
3- the initial empiric therapy should be re-evaluated if it has no clinical effect within 24 hours
4- in the therapy of meningitis, perorally applied antibiotics are preferred
5- combined ATB therapy is preferred also in therapy of mild community-acquired infection
6+ antimicrobial resistance surveys are considered before empiric choice of ATB therapy
7+ nontoxic drugs are always preferred to toxic ones
8- to patients allergic to penicillins, these ATBs are given together with antihistamines
9- ATB dosing should always be decreased after improvement of the clinical state

8040Among the reasons for antibiotic therapy failure belong the following
0+ bacteria produce biofilm in the infectious focus
1- patient is taking autovaccines during antibiotic therapy
2+ intracellular bacteria in the patient's body entered to the state of persistence
3- patient is taking therapeutic phage cocktails during antibiotic therapy
4+ infectious focus is not well supplied by blood (valid for systemic ATB application)
5+ immunodeficient patient was treated by bacteriostatic antibacterial agent
6+ the colonised foreign body was not removed from patient's infectious focus
7+ resistant bacterial mutants were selected during therapy
8- patient was using higher doses of antibiotics than prescribed
9- patient was using antibiotics for longer time than prescribed